



RETURN BIDS TO:

RETOURNER LES SOUMISSIONS À:

Bid Receiving - PWGSC / Réception des soumissions -
TPSGC

11 Laurier St. / 11, rue Laurier

Place du Portage, Phase III

Core 0B2 / Noyau 0B2

Gatineau

Québec

K1A 0S5

Bid Fax: (819) 997-9776

**SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address

Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Ship Construction, Refit and Related
Services/Construction navale, Radoubs et services
connexes

11 Laurier St. / 11, rue Laurier

6C2, Place du Portage

Gatineau

Québec

K1A 0S5

Title - Sujet NSFRV Build	
Solicitation No. - N° de l'invitation F7013-220306/A	Amendment No. - N° modif. 001
Client Reference No. - N° de référence du client F7013-220306	Date 2022-10-03
GETS Reference No. - N° de référence de SEAG PW-\$\$MC-040-28811	
File No. - N° de dossier 040mc.F7013-220306	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM Eastern Daylight Saving Time EDT on - le 2022-11-28 Heure Avancée de l'Est HAE	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Deslauriers(MC Div), Stephane	Buyer Id - Id de l'acheteur 040mc
Telephone No. - N° de téléphone (819) 420-2899 ()	FAX No. - N° de FAX (819) 956-0897
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

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PART 1 - GENERAL INFORMATION

1.1 Introduction

The bid solicitation is divided into seven parts plus attachments and annexes, as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation and states that the Bidder agrees to be bound by the clauses and conditions contained in all parts of the bid solicitation;
- Part 3 Bid Preparation Instructions: provides Bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, if applicable, and the basis of selection;
- Part 5 Certifications and Additional Information: includes the certifications and additional information to be provided;
- Part 6 Financial and Other Requirements: includes specific requirements that must be addressed by Bidders; and
- Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include the Statement of Work, the Basis of Payment, the Federal Contractors Program for Employment Equity - Certification, the Insurance Requirements and other Annexes.

1.2 Summary

1. The Requirement is:
 - a) The Department of Fisheries and Oceans (DFO) and the Canadian Coast Guard (CCG) have a requirement to build and deliver (1) new Near Shore Fishery Research Vessel (NSFRV). The primary function of the NSFRV is oceanographic science. Secondary missions require capabilities consistent with search and rescue and environmental response.
 - b) To carry out unscheduled work authorized by the Contracting Authority during the course of the contract.
2. This bid solicitation requires Bidders to use the CPCConnect service provided by Canada Post Corporation to transmit their bid electronically. Bidders must refer to Part 2 entitled Bidder Instructions, and Part 3 entitled Bid Preparation Instructions, of the bid solicitation, for further information.
3. The Federal Contractors Program (FCP) for employment equity applies to this procurement; refer to Part 5 – Certifications and Additional Information, Part 7 - Resulting Contract Clauses and the annex titled Federal Contractors Program for Employment Equity - Certification.
4. As per the Integrity Provisions under section 01 of Standard Instructions [2003](#), Bidders must provide a list of all owners and Directors and other associated information as required. Refer to section 4.21 of the Supply Manual for additional information on the Integrity Provisions.
5. The requirement is exempt from the provisions of the World Trade Organization Agreement on Government Procurement (WTO-AGP), i.e. Shipbuilding and Repair is excluded from coverage at Annex 7, General Notes, 1. (a). The requirement is subject to the Canadian Free Trade Agreement (CFTA).

6. The sourcing strategy relating to this procurement will be limited to Canadian suppliers, as permitted by the CFTA. In line with the *Shipbuilding, Repair, Refit, and Modernization Policy* (2010-08-16) and with the *Buy in Canada Policy*, the work must be carried out at a shipyard located in Eastern Canada (ON, QC, NB, NS, NL, PEI).
7. Canada will be including the use of trade names or trademarks without allowing for equivalent products, on an exceptional basis as itemized in Annex "R". These measures are necessary for CCG to meet its operational requirements and to achieve legitimate objectives of public security and safety, protection of the health, safety, and well-being of workers, and the protection of the environment.
8. This procurement includes a mandatory Indigenous Participation Component (IPC) under the Procurement Strategy for Indigenous Business program.

1.3 Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone, by video conference or in person.

1.4 Fairness Monitor

Canada has retained the services of a fairness monitor for the entire procurement process to act as a third party monitor. This fairness monitor will be given access to all the procurement documents and responses submitted by the Respondents for all phases and provide recommendations to Canada on its processes and method of selection to ensure they meet the Government of Canada mandate on openness, equality and fairness.

1.5 Phased Bid Compliance Process

The Phased Bid Compliance Process applies to this requirement.

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual ([Standard Acquisition Clauses and Conditions \(SACC\) Manual - Buyandsell.gc.ca](#)) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The [2003](#) (2022-03-29) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: 60 days

And

Insert: 180 days

2.1.1 SACC Manual Clauses

B1000T (2014-06-26), Condition of Material – Bid
B3000T (2006-06-16), Equivalent Products

2.2 Design Instructions and Guidance (DIG) plus the Design Drawing Package

The Bidder must contact the Contracting Authority to obtain a copy of the Design Instructions and Guidance (DIG) document as well as the design drawing package. The Bidder must consider these documents in regards to the level of effort and cost to mature the design to construction.

The documents will be sent using Canada Post Corporation (CPC) Connect service.

2.3 Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on the front page of the bid solicitation.

PWGSC Bid Receiving Unit

Only bids submitted using Canada Post Corporations (CPC) Connect service will be accepted. The Bidder must send an email requesting to open a CPC Connect conversation to the following address:

tpsgc.pareceptiondessomissions-apbidReceiving.pwgsc@tpsgc-pwgsc.gc.ca

Note: Bids will not be accepted if emailed directly to this email address. This email address is to be used to open an CPC Connect conversation, as detailed in Standard Instructions [2003](#), or to send bids through an CPC Connect message if the Bidder is using its own licensing agreement for CPCConnect.

It is the Bidder's responsibility to ensure the request for opening an CPC Connect conversation is sent to the email address above at least six days before the solicitation closing date.

Bids transmitted by facsimile or in hard copy to PWGSC will not be accepted.

2.4 Enquiries - Bid Solicitation

All enquiries must be submitted in writing by email to the Contracting Authority (stephane.deslauriers@tpsgc-pwgsc.gc.ca) no later than **2 pm EDT on November 21, 2022**. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a "proprietary" nature must be clearly marked "proprietary" at each relevant item. Items identified as proprietary will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

Any clarifications or changes to the bid solicitation resulting from the questions and answers will be included as an amendment to the bid solicitation.

2.5 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in the province of **Quebec**.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidders.

2.6 Improvement of Requirement During Solicitation Period

Should Bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, Bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular Bidder will be given consideration provided they are submitted to the Contracting Authority at least 7 days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

2.7 Indigenous Participation Component (IPC)

- a. The IPC is a mechanism designed to meet the Government of Canada's objectives of encouraging Indigenous socio-economic development through federal contracting opportunities. The IPC is also designed to encourage Industry Respondents to contribute to creating long-term sustainable and meaningful socio-economic benefits for Indigenous people, businesses and communities.
- b. Example of acceptable IPCs:
 - (i) The IPC's main goal consists of Indigenous Business Development and encourages prime Contractors to contribute and invest in building and developing viable Indigenous business capacity by procuring goods and services from Indigenous firms qualified under the Procurement Strategy for Indigenous Business. Prime Contractors or their subcontractor(s) are also encouraged to demonstrate how they intend to maximize the use of Indigenous firms such as identify the work intended to be carried out by Indigenous firms including contract and supply chain management. Bidders should refer to Annex "M", Form 1 and Form 2 for information that can help identify Indigenous business capacity, for contracting and subcontracting purposes.
 - (ii) The IPC also encourages the use of Indigenous Employment; prime Contractors are encouraged to demonstrate how Indigenous employment will be maximized and include details pertaining to Indigenous recruitment and retention strategies and related job activities such as the work to be

carried out by each position. Bidders may wish to contact Employment and Social Development Canada (ESDC) to find out about Indigenous Labour Programs.

- (iii) The IPC also consists of Indigenous Training and Skills Development; prime contractors are encouraged to demonstrate how training opportunities and skills development will be maximized for Indigenous persons such as how they intend to provide on-the job training, in-house training as well as succession plans.
- (iv) When there is a lack of Indigenous business capacity, the prime Contractor may consider other relevant measures (indirect benefits) such as, but not limited to specialized training, career development, scholarships and community outreach to help Indigenous communities in meeting their economic development needs. In support of the IPC, Bidders are encouraged to reach out to Indigenous businesses and communities.

2.8 Bid Challenge and Recourse Mechanisms

- a. Several mechanisms are available to potential suppliers to challenge aspects of the procurement process up to and including contract award.
- b. Canada encourages suppliers to first bring their concerns to the attention of the Contracting Authority. Canada's Buy and Sell website, under the heading "Bid Challenge and Recourse Mechanisms" contains information on potential complaint bodies such as:
 - 1. Office of the Procurement Ombudsman (OPO)
 - 2. Canadian International Trade Tribunal (CITT)
- c. Suppliers should note that there are strict deadlines for filing complaints, and the time periods vary depending on the complaint body in question. Suppliers should therefore act quickly when they want to challenge any aspect of the procurement process.

PART 3 - BID - PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

The Bidder must submit its bid electronically in accordance with section 08 of the 2003 standard instructions. The CPC Connect system has a limit of 1GB per single message posted and a limit of 20GB per conversation.

The bid must be gathered per section and separated as follows:

- Section I: Technical Bid
- Section II: Financial Bid
- Section III: Certifications and Additional Information

Due to the nature of the bid solicitation, bids transmitted by facsimile or in hard copy will not be accepted.

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Information Required in the Bids

The Bidder must provide all of the deliverables referenced in section O1 Deliverables Checklist of Annex "O" Deliverables/Certifications, to be gathered within the specified Sections (I, II, or III), as indicated.

Section I: Technical Bid

The Bidder must provide a completed Annex "P" – Mandatory Technical Criteria and Point Rated Criteria, and provide supporting evidence, where requested.

In their technical bid, Bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability and describe their approach in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

Section II: Financial Bid

Bidders must submit their financial bid in accordance with Annex "B" Basis of Payment, Price Table 1. The total amount of Applicable Taxes must be shown separately.

Section III: Certifications and Additional Information

Bidders must submit the certifications required under Part 5, as well as any other additional information identified in Annex "O" Deliverables/Certifications.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Phased Bid Compliance Process (PBCB)

4.1.1 General

- (a) Canada is conducting the PBCP described below for this requirement.
- (b) Notwithstanding any review by Canada at Phase I or II of the PBCP, Bidders are and will remain solely responsible for the accuracy, consistency and completeness of their Bids and Canada does not undertake, by reason of this review, any obligations or responsibility for identifying any or all errors or omissions in Bids or in responses by a Bidder to any communication from Canada.

THE BIDDER ACKNOWLEDGES THAT THE REVIEWS IN PHASE I AND II OF THIS PBCP ARE PRELIMINARY AND DO NOT PRECLUDE A FINDING IN PHASE III THAT THE BID IS NON-RESPONSIVE, EVEN FOR MANDATORY REQUIREMENTS WHICH WERE SUBJECT TO REVIEW IN PHASE I OR II AND NOTWITHSTANDING THAT THE BID HAD BEEN FOUND RESPONSIVE IN SUCH EARLIER PHASE. CANADA MAY DEEM A BID TO BE NON-RESPONSIVE TO A MANDATORY REQUIREMENT AT ANY PHASE.

THE BIDDER ALSO ACKNOWLEDGES THAT ITS RESPONSE TO A NOTICE OR A COMPLIANCE ASSESSMENT REPORT (CAR) (EACH DEFINED BELOW) IN PHASE I OR II MAY NOT BE SUCCESSFUL IN RENDERING ITS BID RESPONSIVE TO THE MANDATORY REQUIREMENTS THAT ARE THE SUBJECT OF THE NOTICE OR CAR, AND MAY RENDER ITS BID NON-RESPONSIVE TO OTHER MANDATORY REQUIREMENTS.

- (c) Canada may, in its discretion, request and accept at any time from a Bidder and consider as part of the Bid, any information to correct errors or deficiencies in the Bid that are clerical or administrative, such as, without limitation, failure to sign the Bid or any part or to checkmark a box in a form, or other failure of format or form or failure to acknowledge; failure to provide a procurement business number or contact information such as names, addresses and telephone numbers; inadvertent errors in numbers or calculations that do not change the amount the Bidder has specified as the price or of any component thereof that is subject to evaluation. This shall not limit Canada's right to request or accept any information after the bid solicitation closing in circumstances where the bid solicitation expressly provides for this right. The Bidder will have the time period specified in writing by Canada to provide the necessary documentation. Failure to meet this deadline will result in the Bid being declared non-responsive.
- (d) The PBCP does not limit Canada's rights under Standard Acquisition Clauses and Conditions (SACC) 2003 (2022-03-29) Standard Instructions — Goods or Services — Competitive Requirements nor Canada's right to request or accept any information during the solicitation period or after bid solicitation closing in circumstances where the bid solicitation expressly provides for this right, or in the circumstances described in subsection (c).
- (e) Canada will send any Notice or CAR by any method Canada chooses, in its absolute discretion. The Bidder must submit its response by the method stipulated in the Notice or CAR. Responses are deemed to be received by Canada at the date and time they are delivered to Canada by the method and at the address specified in the Notice or CAR. An email response permitted by the Notice or CAR is deemed received by Canada on the date and time it is received in Canada's email inbox at Canada's email address specified in the Notice or CAR. A Notice or CAR sent by Canada to the Bidder at any address provided by the Bidder in or pursuant to the Bid is deemed received by the Bidder on the date it is sent by Canada. Canada is not responsible for late receipt by Canada of a response, however caused.

4.1.2 Phase I: Financial Bid

- (a) After the closing date and time of this bid solicitation, Canada will examine the Bid to determine whether it includes a Financial Bid and whether any Financial Bid includes all information required by the solicitation. Canada's review in Phase I will be limited to identifying whether any information that is required under the bid solicitation to be included in the Financial Bid is missing from the Financial Bid. This review will not assess whether the Financial Bid meets any standard or is responsive to all solicitation requirements.
- (b) Canada's review in Phase I will be performed by officials of the Department of Public Works and Government Services.
- (c) If Canada determines, in its absolute discretion that there is no Financial Bid or that the Financial Bid is missing all of the information required by the bid solicitation to be included in the Financial Bid, then the Bid will be considered non-responsive and will be given no further consideration.
- (d) For Bids other than those described in c), Canada will send a written notice to the Bidder ("Notice") identifying where the Financial Bid is missing information. A Bidder, whose Financial Bid has been found responsive to the requirements that are reviewed at Phase I, will not receive a Notice. Such Bidders shall not be entitled to submit any additional information in respect of their Financial Bid.
- (e) The Bidders who have been sent a Notice shall have the time period specified in the Notice (the "Remedy Period") to remedy the matters identified in the Notice by providing to Canada, in writing, additional information or clarification in response to the Notice. Responses received after the end of the Remedy Period will not be considered by Canada, except in circumstances and on terms expressly provided for in the Notice.
- (f) In its response to the Notice, the Bidder will be entitled to remedy only that part of its Financial Bid which is identified in the Notice. For instance, where the Notice states that a required line item has been left blank, only the missing information may be added to the Financial Bid, except that, in those instances where the addition of such information will necessarily result in a change to other calculations previously submitted in its Financial Bid, (for example, the calculation to determine a total price), such necessary adjustments shall be identified by the Bidder and **only** these adjustments shall be made. All submitted information must comply with the requirements of this solicitation.
- (g) Any other changes to the Financial Bid submitted by the Bidder will be considered to be new information and will be disregarded. There will be no change permitted to any other Section of the Bidder's Bid. Information submitted in accordance with the requirements of this solicitation in response to the Notice will replace, in full, only that part of the original Financial Bid as is permitted above, and will be used for the remainder of the bid evaluation process.
- (h) Canada will determine whether the Financial Bid is responsive to the requirements reviewed at Phase I, considering such additional information or clarification as may have been provided by the Bidder in accordance with this Section. If the Financial Bid is not found responsive for the requirements reviewed at Phase I to the satisfaction of Canada, then the Bid shall be considered non-responsive and will receive no further consideration.
- (i) Only Bids found responsive to the requirements reviewed in Phase I to the satisfaction of Canada, will receive a Phase II review.

4.1.3 Phase II: Technical Bid

- (a) Canada's review at Phase II will be limited to a review of the Technical Bid to identify any instances where the Bidder has failed to meet any Eligible Mandatory Criteria requested for the bid. This review will not assess whether the Technical Bid meets any standard or is responsive to all solicitation requirements. Eligible Mandatory Criteria are all mandatory technical criteria that are identified in this solicitation as being subject to the PBCP. Mandatory technical criteria that are not identified in the solicitation as being subject to the PBCP, will not be evaluated until Phase III.

- (b) Canada will send a written notice to the Bidder (Compliance Assessment Report or "CAR") identifying any Eligible Mandatory Criteria that the Bid has failed to meet. A Bidder whose Bid has been found responsive to the requirements that are reviewed at Phase II will receive a CAR that states that its Bid has been found responsive to the requirements reviewed at Phase II. Such Bidder shall not be entitled to submit any response to the CAR.
- (c) A Bidder shall have the period specified in the CAR (the "Remedy Period") to remedy the failure to meet any Eligible Mandatory Criterion identified in the CAR by providing to Canada in writing additional or different information or clarification in response to the CAR. Responses received after the end of the Remedy Period will not be considered by Canada, except in circumstances and on terms expressly provided for in the CAR.
- (d) The Bidder's response must address only the Eligible Mandatory Criteria listed in the CAR as not having been achieved, and must include only such information as is necessary to achieve such compliance. Any additional information provided by the Bidder which is not necessary to achieve such compliance will not be considered by Canada, except that, in those instances where such a response to the Eligible Mandatory Criteria specified in the CAR will necessarily result in a consequential change to other parts of the Bid, the Bidder shall identify such additional changes, provided that its response must not include any change to the Financial Bid.
- (e) The Bidder's response to the CAR should identify in each case the Eligible Mandatory Criterion in the CAR to which it is responding, including identifying in the corresponding section of the original Bid, the wording of the proposed change to that section, and the wording and location in the Bid of any other consequential changes that necessarily result from such change. In respect of any such consequential change, the Bidder must include a rationale explaining why such consequential change is a necessary result of the change proposed to meet the Eligible Mandatory Criterion. It is not up to Canada to revise the Bidder's Bid, and failure of the Bidder to do so in accordance with this subparagraph is at the Bidder's own risk. All submitted information must comply with the requirements of this solicitation.
- (f) Any changes to the Bid submitted by the Bidder other than as permitted in this solicitation, will be considered to be new information and will be disregarded. Information submitted in accordance with the requirements of this solicitation in response to the CAR will replace, in full, only that part of the original Bid as is permitted in this Section.
- (g) Additional or different information submitted during Phase II permitted by this section will be considered as included in the Bid, but will be considered by Canada in the evaluation of the Bid at Phase II only for the purpose of determining whether the Bid meets the Eligible Mandatory Criteria. It will not be used at any Phase of the evaluation to increase or decrease any score that the original Bid would achieve without the benefit of such additional or different information. For instance, an Eligible Mandatory Criterion that requires a mandatory minimum number of points to achieve compliance will be assessed at Phase II to determine whether such mandatory minimum score would be achieved with such additional or different information submitted by the Bidder in response to the CAR. If so, the Bid will be considered responsive in respect of such Eligible Mandatory Criterion, and the additional or different information submitted by the Bidder shall bind the Bidder as part of its Bid, but the Bidder's original score, which was less than the mandatory minimum for such Eligible Mandatory Criterion, will not change, and it will be that original score that is used to calculate any score for the Bid.
- (h) Canada will determine whether the Bid is responsive for the requirements reviewed at Phase II, considering such additional or different information or clarification as may have been provided by the Bidder in accordance with this Section. If the Bid is not found responsive for the requirements reviewed at Phase II to the satisfaction of Canada, then the Bid shall be considered non-responsive and will receive no further consideration.

- (i) Only Bids found responsive to the requirements reviewed in Phase II to the satisfaction of Canada, will receive a Phase III evaluation.

4.1.4 Phase III: Final Evaluation of the Bid

- (a) In Phase III, Canada will complete the evaluation of all Bids found responsive to the requirements reviewed at Phase II. Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) A Bid is non-responsive and will receive no further consideration if it does not meet all mandatory evaluation criteria of the solicitation.

4.2 Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical, and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids. A Fairness Monitor (FM) has been engaged to oversee the process. A FM working at arm's length from Canada's evaluation team will be observing and reporting on the NSFRV procurement process. The FM will have unrestricted access to all evaluation facilities in order to perform observations.
- (c) Canada will use the Phased Bid Compliance Process described above.

4.2.1 Technical Bid Evaluation

The Technical bid will be assessed against the Mandatory Technical Criteria in Annex "P" - Mandatory Technical Criteria and the Point Rated Technical Criteria.

Notwithstanding deliverable requirements specified within the bid solicitation and the Statement of Work found at Annex "A" – Statement of Work, mandatory deliverables that must be submitted with the Bidder's bid to be evaluated as responsive are summarized in Annex "O" – Deliverables / Certifications – O1 Deliverables Checklist.

Canada reserves the right to request information to support any bid requirement. The Bidder is instructed to address each requirement in sufficient depth to permit a complete analysis and assessment by the Evaluation Team. The Bid will be evaluated as responsive if it is found to meet all of the mandatory requirements.

The Phased Bid Compliance Process will apply to all Mandatory Technical Criteria in Annex "P" - Mandatory Technical Criteria and the Point Rated Technical Criteria.

4.2.2 Joint Ventures Experience

A Bidder may meet the evaluation criteria itself and bid as a corporation or other such single legal entity or may meet the evaluation criteria as a joint venture if the members of the joint venture together meet the evaluation criteria. In either event, the Bidder itself must meet the evaluation criteria. Canada will not accept any bid by a joint venture composed of more than **3** members. Please note the following:

- a) Where the Bidder is a joint venture with existing experience as that joint venture (and certain experience is specified to be an evaluation criterion), the Bidder may submit the experience that it has obtained as that joint venture.

Example: A Bidder is a joint venture consisting of members L and O. A bid solicitation requires that the Bidder demonstrate experience providing maintenance and support services for a period

of 24 months to a customer with a fleet of at least 10 vessels. As a joint venture (consisting of members L and O), the Bidder has previously done the work. This Bidder can use this experience to meet the requirement. If member L obtained this experience while in a joint venture with a third party N, however, that experience cannot be used because the third party N is not part of the joint venture that is bidding.

- b) A joint venture Bidder may rely on the experience of one of its members to meet any evaluated technical criterion of this bid solicitation.

Example: A Bidder is a joint venture consisting of members Y and Z. If a solicitation requires: (a) that the Bidder have 3 years of experience providing maintenance service, and (b) that the Bidder have 2 years of experience integrating hardware with complex systems, then each of these two requirements can be met by a different member of the joint venture. However, for a single criterion, such as the requirement for 2 years of experience integrating hardware with complex systems, the Bidder cannot indicate that each of members Y and Z has one year of experience, totalling 2 years. Such a response would be declared non-responsive.

- c) A joint venture member cannot pool its experience with the other joint venture member to satisfy a single technical criterion of this bid solicitation. However, a joint venture member can pool its individual experience with the experience of the joint venture itself.

4.2.3 Joint Venture Substantiation

Wherever substantiation of a criterion is required, the Bidder is requested to indicate which joint venture member satisfies the requirement. If the Bidder has not identified which joint venture member satisfies the requirement, the Contracting Authority will provide an opportunity to the Bidder to submit this information during the evaluation period. If the Bidder does not submit this information within the period set by the Contracting Authority, its bid will be declared non-responsive.

- a) Example: A bidder is a joint venture consisting of members A and B. If a bid solicitation requires that the Bidder demonstrate experience providing resources for a minimum number of 100 billable days, the Bidder may demonstrate that experience by submitting either:
- Contracts all signed by A;
 - Contracts all signed by B; or
 - Contracts all signed by A and B in joint venture, or
 - Contracts signed by A and contracts signed by A and B in joint venture, or
 - Contracts signed by B and contracts signed by A and B in joint venture.
 -
- b) That show in total 100 billable days.

4.2.4 Financial Evaluation

Bidders should complete the Price Table 1 and Charge-out Rate located in Annex "B" Basis of Payment. The price of the bid will be evaluated in Canadian dollars, Applicable Taxes excluded, FOB destination, Canadian customs duties and excise taxes included.

Bidders must include all costs in their bid associated with executing and administering the Contract in accordance with all measures that provincial, municipal and federal governments and public health authorities have instituted to protect against the threat of the severe acute respiratory syndrome coronavirus which causes the coronavirus disease ("Covid-19"), in addition to any other measures implemented by the shipyard/Bidder, that were in place or required as of the date of bid submission. This includes, but is not limited to: Covid-19 specific cleaning (labour & Material), Personal Protective Equipment (PPE), Covid-19

testing/monitoring, additional equipment, extra labour, shift differentials and any additional administration/planning/project management.

4.2.5 Basis of Selection - Highest Combined Rating of Technical Merit (70%) and Price (30%)

A bid must comply with all requirements of the bid solicitation to be declared responsive.

A mandatory requirement is described using the words "shall", "must", "will", "is required", "is to", "is responsible", "requires" or "is Mandatory".

To be declared responsive, a bid must:

- comply with all the requirements of the bid solicitation, including the requirements of Part 5 and Part 6 of this solicitation;
- meet all the mandatory criteria, including, Mandatory Technical Criteria, and Mandatory Financial Criteria;
- obtain the required minimum pass mark of 180 points for the Point Rated Technical Criteria as contained in Annex "P".

The rating is performed on a Total Points Score of 305 points.

Bids not meeting "(a) or (b) or (c)" will be declared non-responsive.

The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 70 % for the technical merit and 30% for the price.

To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by the ratio of 70%.

To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 30%.

For each responsive bid, the technical merit score and the pricing score will be added to determine the combined rating.

Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.

EXAMPLE ONLY:

The table below illustrates **an example** where all three bids are responsive and the selection of the contractor is determined by a 70/30 ratio of technical merit and price, respectively. The total available points equals 305 and the lowest evaluated price is \$45,000.00.

Basis of Selection - Highest Combined Rating of Technical Merit (70%) and Price (30%)

	Bidder 1	Bidder 2	Bidder 3
Overall Technical Score	170/305	250/305	295/305
Bid Evaluated Price	\$55,000.00	\$50,000.00	\$45,000.00

Calculations Technical Merit Score	$170/305 \times 70 = 39.02$	$250/305 \times 70 = 57.38$	$295/305 \times 70 = 67.70$
Pricing Score	$45/55 \times 30 = 24.55$	$45/50 \times 30 = 27$	$45/45 \times 30 = 30$
Combined Rating (Technical Merit Score + Pricing Score)	63.57	84.38	97.70
Overall Rating	Did not meet the minimum pass mark	2nd	1st

The calculation of the total bid price for the purposes of evaluation is shown in Annex "B" Basis of Payment

Bidders should note that all Contract Awards are subject to Canada's internal approval process, which includes a requirement to approve funding in the amount of any proposed Contract. Notwithstanding that a Bidder may have been recommended for award of Contract, issuance of any Contract will be contingent upon internal approval in accordance with Canada's policies. If such approval is not given, no Contract will be awarded.

PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default in carrying out any of its obligations under the Contract, if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority may render the bid non-responsive or constitute a default under the Contract.

5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Integrity Provisions of the Standard Instructions, all Bidders must provide with their bid, **if applicable**, the Integrity declaration form available on the Forms for the Integrity Regime website (<http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html>), to be given further consideration in the procurement process.

5.1.2 Indigenous Participation Component – Certification Form

By submitting a bid, the Bidder certifies that it will meet the Indigenous Participation Component (IPC) if the Bidder is awarded a contract. Therefore, at the time of bid closing, the Bidder must provide the Contracting Authority with the completed IPC Certification forms provided at Annex "K" – IPC Certification Forms Part 1 and Part 2. The Bidder should indicate where completed IPC Certification forms can be found in their proposal.

5.2 Certifications Precedent to Contract Award and Additional Information

The certifications listed below should be submitted with the bid but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications within the time frame specified will render the bid non-responsive.

5.2.1 Integrity Provisions – Required Documentation

In accordance with the section titled "Information to be provided when bidding, contracting or entering into a real property agreement" of the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html>).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed Annex "C" Federal Contractors Program for Employment Equity - Certification, before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

5.2.3 Workers Compensation Certification – Letter of Good Standing

The Bidder must have an account in good standing with the applicable provincial or territorial Workers' Compensation Board.

5.2.4 Certification of Welding

It is a requirement of this RFP that the Bidders must provide evidence of certification for the current year for their shipyard with their bids and agree to maintain certification, until completion of the project, by the Canadian Welding Bureau (CWB) to CSA Standard W47.1: "Certification of Companies for Fusion Welding of Steel".

The Bidder hereby attaches the following applicable information with the bid:

- 1) Proof of certification to CSA Standard W47.1 for the current year; and
- 2) Proof of CWB currently approved welding procedure specifications and supporting welding data sheets to construct the boat to project welding requirements; and

Either

- 3) Proof of employed or sub-contracted inspection personnel are currently certified to CSA Standard W178.2; and
- 4) Proof of employed welders currently certified to CSA Standard W47.1; and
- 5) Proof of employed welding supervisors currently certified to CSA Standard W47.1 and W59;

Or

- 6) Proof of capability to obtain as and when required personnel currently certified / approved to the standards identified in 3) and 4) and 5) above.

5.2.5 Valid Labour Agreement

Where the Bidder has a labour agreement, or other suitable instrument, in place with its unionized labour, and where such labour agreement or instrument is scheduled to expire during the period of the Contract, the Bidder represents that negotiations and good faith bargaining have commenced at least six (6) months in advance of the labour agreement expiry. The Bidder further represents and warrants that it will take all appropriate actions to ensure a continuous valid labour agreement, with all its workers, for the duration of the Contract.

The Bidder hereby provides the following documentation as part of its bid:

- a) List of all labour unions at Bidder's facilities; and
- b) List the number of labour agreements in force with these unions and provide copies of all labour agreements in force; or
- c) Statement that there are no labour unions at the bidder's facility.

5.2.6 Status and Availability of Resources

The Bidder certifies that, should it be awarded a Contract as a result of the bid solicitation, every individual proposed in its bid will be available to perform the Work as required by Canada's representatives and at the time specified in the bid solicitation or agreed to with Canada's representatives. If for reasons beyond its control, the Bidder is unable to provide the services of an individual named in its bid, the Bidder may propose a substitute with similar qualifications and experience. The Bidder must advise the Contracting Authority of the reason for the substitution and provide the name, qualifications and experience of the proposed replacement. For the purposes of this clause, only the following reasons will be considered as beyond the control of the Bidder: death, sickness, maternity and parental leave, retirement, resignation, dismissal for cause or termination of an agreement for default.

If the Bidder has proposed any individual who is not an employee of the Bidder, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her résumé to Canada. The Bidder must, upon request from the Contracting Authority, provide a written confirmation, signed by the individual, of the permission given to the Bidder and of his/her availability. Failure to comply with the request may result in the bid being declared non-responsive.

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

6.1 Financial Capability

SACC Manual Clause A9033T (2012-07-16) Financial Capability applies to and forms part of the bid solicitation.

6.2 Security Requirements

There is no security requirement associated with this bid solicitation.

6.3 Workers' Compensation - Letter of Good Standing

The Bidder must have an account in good standing with the applicable provincial or territorial Workers' Compensation Board.

The Bidder must provide with its bid, a certificate or letter from the applicable Worker's Compensation Board confirming the Bidder's good standing account.

6.4 Valid Labour Agreement

If the Bidder has a labour agreement, or other suitable instrument, in place with all its unionized labour, it must be valid for the proposed period of any resulting contract. Documentary evidence of the agreement or suitable instrument must be provided in their bid. The Bidder must provide a letter stating that they are a non-unionized facility, if applicable.

6.5 Delivery Schedule

Milestone deliverables are listed in Annex "B" Basis of Payment in Table 2. Canada requires that the deliverables be ready for acceptance; that is, complete in all respects, with all testing successfully completed, when applicable, in accordance with the Contract.

6.6 ISO 9001:2015 - Quality Management Systems

The Bidder must have in place a Quality Management System registered to ISO 9001:2015 and must provide with its bid, at bid closing, the following:

1. Valid ISO 9001-2015 certification.

6.7 Health and Safety

The Bidder must submit with its bid objective evidence that it has a documented Health and Safety system fully compliant with all current Federal, Provincial and Municipal regulations.

6.8 Insurance Requirements

The Bidder must provide with its bid a letter from an insurance broker or an insurance company licensed to operate in Canada stating that the Bidder, if awarded a contract as a result of the bid solicitation, can be insured in accordance with the Insurance Requirements specified in Annex "F".

6.9 Welding Certification

1. Welding performed in Canada must be performed by a welder certified by the Canadian Welding Bureau (CWB) and in accordance with the requirements of the following Canadian Standards Association (CSA) standards:

a. CSA W47.1- latest edition, Certification for Companies for Fusion Welding of Steel (Division Level 1 or 2), including the implementation of the Marine Annex in the Company's scope of Operations (for example, Marine Operations);

b. CSA W47.2 – latest edition, Certification for Companies for Fusion Welding of Aluminum (Division Level 1 or 2).

The Bidder must submit with its bid, evidence demonstrating its certification by CWB (Letter of Validation) in accordance with the CSA standards. The certification must remain valid for the duration of the contract.

Proof of Certification for Companies for Fusion Welding of Aluminum is not required with the bid but must be readily available before the commencement of any fabrication work, and upon request from the Technical Authority. The certification must remain valid for the duration of the contract.

A list of qualified welders to work on the Contract may be requested after the bid closing date.

6.10 List of Proposed Subcontractors

If the bid includes the use of subcontractors, the Bidder must provide a list of all subcontractors included at Annex "D" including a description of the things to be purchased, a description of the work to be performed by specification section and the location of the performance of that work. The list should not include the purchase of commercial off-the-shelf items, software and such standard articles and materials as are ordinarily produced by manufacturers in the normal course of business, or the provision of such incidental services as might ordinarily be subcontracted in performing the Work, i.e. subcontract work valued at less than \$ 5,000.00 aggregate for the Contract.

6.11 Quality Control Plan

The Bidder must submit in its bid its Quality Control Plan (QCP) following DID Q-001 Quality Plan and as per CDRL.

6.12 Inspection and Test Plan

The Bidder must submit in its bid an Inspection and Test Plan (ITP) completed with requirement and inspection reports following DID Q-002 Inspection Plan and Q-003 Tests and Trials Plan as per the CDRL.

6.13 Economic Price Adjustment (EPA)

1. The Bidder may request Canada to assume the risks and benefits of economic price adjustments. If the Bidder claims for an economic price adjustment, this request must be clearly indicated in the bid at time of bidding. The Bidder must submit form PWGSC-TPSGC EPA (part of Annex R - Economic Price Adjustment and Exchange Rate Adjustment - Sheet), Claim for Economic Price Adjustment with its bid, indicating the Bid Component Price (column 4, P_0) in Canadian dollars (pre-tax values) for each line item for which an economic price adjustment is required. A list of eligible items (column 1 to 3) and applicable indices (column 6) is populated on the form for economic price adjustment consideration.
2. P_0 is defined as the Bid Component Price that will be directly affected by economic fluctuations. P_0 should not include related taxes
3. The total price paid by Canada on each invoice will be adjusted at the time of payment, based on P_0 and the applicable index . Allowable Indices are listed in the following table:

Applicable Index*:			
1	Machinery and equipment (P72)	<u>Statistics Canada. Table 18-10-0265-01 Industrial product price index, by major product group.</u>	Industrial product price index, by major product group, monthly (statcan.gc.ca)

		<u>monthly</u>	
2	Electrical, electronic, audiovisual and telecommunications products (P73)	<u>Statistics Canada. Table 18-10-0265-01 Industrial product price index, by major product group, monthly</u>	Industrial product price index, by major product group, monthly (statcan.gc.ca)
3	<i>Energy and petroleum products (P51)</i>	<u>Statistics Canada. Table 18-10-0265-01 Industrial product price index, by major product group, monthly</u>	<i>Industrial product price index, by major product group, monthly (statcan.gc.ca)</i>
4	<i>Fabricated metal products and construction materials (P63)</i>	<u>Statistics Canada. Table 18-10-0265-01 Industrial product price index, by major product group, monthly</u>	<i>Industrial product price index, by major product group, monthly (statcan.gc.ca)</i>

4. At time of bidding, the Bidder adjusts the unit quantity in column 5 of form PWGSC-TPSGC EPA, from 0 to 1 for each line item where they want to invoke an economic price adjustment provision.
5. Certain items will require the bidder to enter a percentage in Column 5, to indicate the portion (as described in Column 2) of the total cost calculated in Column 4 that requires an adjustment.
6. Alternate rates or calculations proposed by the Bidder will not be accepted for the purposes of this economic price adjustment provision.

6.14 Exchange Rate Fluctuation Risk Mitigation

1. The Bidder may request Canada to assume the risks and benefits of exchange rate fluctuations. If the Bidder claims for an exchange rate adjustment, this request must be clearly indicated in the bid at time of bidding. The Bidder must submit form PWGSC-TPSGC 450 (part of Annex R - Economic Price Adjustment and Exchange Rate Adjustment Sheet), Claim for Exchange Rate Adjustments with its bid, indicating the Foreign Currency Component (FCC) in Canadian dollars (pre-tax values) for each line item for which an exchange rate adjustment is required.
2. The FCC (column 3a) is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuations.
3. The total price paid by Canada on each invoice will be adjusted at the time of payment, based on the FCC and the exchange rate fluctuation provision in the contract.
4. At time of bidding, the Bidder must complete columns 3 to 5 (specifically, columns 3b, 4, and 5) on form PWGSC-TPSGC 450, for each line item where they want to invoke the exchange rate fluctuation provision. The Bidder adjusts the unit quantity in column 5, from 0 to 1 for each line item where they want to invoke an exchange rate adjustment provision. The dollar values provided in column 3a should be in Canadian dollars (pre-tax values), so that the adjustment amount is in the same currency as the payment. Certain items will require the bidder to enter a percentage in Column 3b, to indicate the portion (as described in Column 2a) of the total cost calculated in Column 3a that requires an adjustment.
5. Alternate rates or calculations proposed by the Bidder will not be accepted for the purposes of this exchange rate fluctuation provision.

6.15 Fire Protection, Fire Fighting and Training Procedures

The Bidder must submit with its bid objective evidence that it has documented fire protection, firefighting and training procedures compliant with current regulations and their insurance requirements. The fire protection, firefighting and training procedures will, once accepted by Canada, form part of the Contract. Please refer to clause 7.23.

6.16 Environmental Protection

The Bidder must submit in its bid details of its environmental emergency response plans, waste management procedures and formal environmental training undertaken by its employees.

PART 7 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

7.1 Requirement

The Contractor must:

- a) The The Department of Fisheries and Oceans (DFO) and the Canadian Coast Guard (CCG) have a requirement to build and deliver (1) new Near Shore Fishery Research Vessel (NSFRV). The primary function of the NSFRV is oceanographic science. Secondary missions require capabilities consistent with search and rescue and environmental response.

The primary function of the NSFRV is oceanographic science. Secondary missions require capabilities consistent with search and rescue and environmental response.

- b) carry out any unscheduled Work authorized by the Contracting Authority during the course of the Contract.

7.2 Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

7.2.1 General Conditions

2030 (2020-05-28), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract and is amended as follows: .

Delete Section 22 (2014-09-25) Warranty, in its entirety and replace with the following:

Despite inspection and acceptance of the Work by or on behalf of Canada and without restricting any other provision of the Contract or any condition, warranty or provision imposed by law, the Contractor warrants that, for 12 months except if stated otherwise in the Contract, the Work will be free from all defects in design, material or workmanship, and will conform to the requirements of the Contract. The warranty period begins on the date of delivery, or if acceptance takes place at a later date, the date of acceptance. With respect to Government Property not supplied by the Contractor, the Contractor's warranty will extend only to its proper incorporation into the Work.

1. For the purpose of the Warranty, acceptance will take place in accordance with Annex "H" - Warranty.
2. The Contractor, if requested by Canada, must replace or repair at its own expense any finished work, excluding Government Issue incorporated in the Work, which becomes defective or which fails to conform to contract requirements as a result of faulty or inefficient manufacture, material or workmanship.
3. In the event of a defect or non-conformance in any part of the Work during the warranty period, the Contractor, at the request of Canada to do so, must as soon as possible repair, replace or otherwise make good at its own option and expense the part of the Work found to be defective or not in conformance with the requirements of the Contract.
4. The Contractor agrees to pass to Canada, and exercise on behalf of Canada, all warranties on the materials supplied or held by the Contractor which exceed the periods indicated above.
5. The Work or any part of the Work found to be defective or non-conforming will be returned to the Contractor's plant for replacement, repair or making good. However, when in the opinion of Canada it is not expedient to remove the Work from its location, the Contractor must carry out any necessary repair or making good of the Work at that location. In such cases, the Contractor will be paid the fair and

reasonable Cost (including reasonable travel and living expenses) incurred in so doing, with no allowance for profit, less an amount equal to the Cost of rectifying the defect or non-conformance at the Contractor's plant.

6. Canada must pay the transportation cost associated with returning the Work or any part of the Work to the Contractor's plant pursuant to subsection 3. The Contractor must pay the transportation cost associated with forwarding the replacement or returning the Work or part of the Work when rectified to the delivery point specified in the Contract or to another location directed by Canada.
7. The Contractor must remedy all data and reports pertaining to any correction or replacement under this section, including revisions and updating of all affected data, manuals, publications, software and drawings called for under the Contract, at no cost to Canada.
8. If the Contractor fails to fulfill any obligation described in this section within a reasonable time of receiving a notice, Canada will have the right to remedy or to have remedied the defective or non-conforming work at the Contractor's expense. If Canada does not wish to correct or replace the defective or non-conforming work, an equitable reduction will be made in the Contract Price.
9. The warranty period is automatically extended by the duration of any period or periods where the Work is unavailable for use or cannot be used because of a defect or non-conformance during the original warranty period. The warranty applies to any part of the Work repaired, replaced or otherwise made good pursuant to subsection 2, for the greater of:
 - a. the warranty period remaining, including the extension, or
 - b. 90 days or such other period as may be specified for that purpose by agreement between the Parties.

Refer to Annex "H" – Warranty for the warranty defect claim procedures and Annex "I" – Forms for the warranty claim form.

7.2.3 Supplemental General Conditions

7.2.3.1 1028 (2010-08-16), Ship Construction – Firm Price, apply to and form part of the Contract.

The Supplemental General Conditions 1028, Article 12 – Warranty, paragraph 3 is deleted and replaced with the following:

The warranty period for the Vessel is twelve (12) months from the date of its delivery to and acceptance by Canada. The entire mechanical and electrical components of the power train, power train resilient mountings and any sub-bases incorporated into the propulsion engine or gearing arrangements shall have a 2-year warranty which commences from acceptance of the vessel by Canada.

7.2.3.2 4006 (2010-08-16), Contractor to Own Intellectual Property Rights in Foreground Information.

7.2.3.3 1031-2 (2012-07-16) Contract Cost Principles, apply to and form part of the Contract.

7.3 Security Requirements

There is no security requirement applicable to the Contract.

7.4 Term of Contract

7.4.1 Period of the Contract

The period of the Contract is from the Contract Award date to two (2) year after delivery and acceptance of the vessel.

7.4.2 Delivery Points

Delivery of the requirement will be made at the Canadian Coast Guard base in Sorel, Quebec.

7.4.3 Milestones Delivery Schedule

Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract at Annex "B" and the payment provisions of the Contract if:

- a. an accurate and complete claim for payment using PWGSC-TPSGC 1111, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;
- c. all work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.

7.5 Authorities

7.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Stephane Deslauriers
Department of Public Works and Government Services Canada (PWGSC)
Marine Construction Division
Tel: (613) 851-2456
E-Mail: Stephane.Deslauriers@tpsgc-pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

7.5.2 Technical Authority

The Technical Authority for the Contract is:

Name will be determined at Contract Award

Name: _____
Telephone: _____
Cell: _____
E-mail: _____

The Technical Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

7.5.3 Inspection Authority

The Inspection Authority for the Contract is the Canadian Coast Guard.

Name will be determined at Contract Award

Name: _____
Telephone: _____
Cell: _____
E-mail: _____

The Inspection Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for the inspection of the Work and acceptance of the finished work. The Inspection Authority may be represented on-site by a designated inspector and any other Government of Canada Inspector who may from time to time be assigned in support of the designated inspector.

7.5.4 Indigenous Participation Component Authority

The Indigenous Participation Component (IPC) Authority for the Contract is:

Department of Indigenous Services Canada (DISC)
10 Wellington Street, 11th Floor. Room 1105
Gatineau, Quebec K1A 0H4

The IPC Authority (or their delegated representative), as designated Department of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)/Department of Indigenous Services Canada (DISC) is the person who is responsible for issues relating to the IPC requirements under this Contract.

7.5.5 Delegation

Each of the Authorities referred to above may from time to time delegate its responsibilities in whole or in part under this Contract and may act through its authorized representative. To be effective, such delegation shall be in writing specifying the nature and extent of the authority given, the name of the representative, with a copy delivered to the Contractor by the Contracting Authority, it being understood that a person to whom responsibilities have been delegated cannot further delegate such responsibilities.

7.5.6 Contractor's Representative

Name will be determined at Contract Award

Name: _____
Telephone: _____
Cell: _____
E-mail: _____

7.6 Payment

7.6.1 Basis of Payment - Firm Price

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid firm unit prices, as specified in Annex "B" for a cost of \$_____ (Canadian Dollars Only) (to be inserted at contract award). Customs duties are included and Applicable Taxes are extra.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

7.6.2 Liens - Section 427 of the Bank Act

SACC Manual Clause H4500C (2010-01-11) Liens - Section 427 of the Bank Act applies to and forms part of the Contract.

7.6.3 Limitation of Price

SACC Manual Clause C6000C (2017-08-17) Limitation of Price applies to and forms part of the Contract.

7.6.4 Time Verification

SACC Manual Clause C0711C (2008-05-12) Time Verification applies to and forms part of the Contract.

7.6.5 Economic Price Adjustment (EPA)

1. P_0 is defined as the Bid Component Price that will be directly affected by economic fluctuations. P_0 should not include related taxes.
2. For each line item where a P_0 is identified such that the quantity has been adjusted to a 1 (column 7 of form PWGSC-TPSGC EPA), Canada assumes the risks and benefits for economic fluctuation, as shown in the Basis of Payment. For such items, the economic price adjustment is determined in accordance with the provision of this clause.
3. The total price paid by Canada on each invoice will be adjusted at the time of payment. The economic price adjustment amount will be calculated in accordance with the following formula:

$$\text{Economic price adjustment} = P_0 \times \text{Qty} \times P_0 \times \text{Qty} \times (\%) \times (X_1 - X_0) / X_0, (X_1 - X_0) / X_0,$$

where formula variables correspond to:

P_0 Component Quantity (Qty)

quantity of units

X_0

Index available for the latest month closest to the bid closing date listed in Column 8 of form PWGSC-TPSGC EPA (part of Annex R - Economic Price Adjustment and Exchange Rate Adjustment - Sheet); the index sources are listed in the table below.

(%)

Items requiring a percentage to be included by the bidder, in column 5, to establish the portion of P_0 in column 4, that corresponds to the description in column 2.

X_1

Index available for the latest month closest to the purchase order placement date listed in Column 9 of form PWGSC-TPSGC EPA (part of Annex R - Economic Price Adjustment and Exchange Rate Adjustment - Sheet); the index sources are listed in the table below.

As an example for item 1, the Economic price adjustment is multiplied by the percentage of the total Propulsion System cost (as indicated by the Contractor from the bid, Column 5, line item 1 in PWGSC-TPSGC EPA) to ascertain the equipment portion for adjustment.

Bid Component Price (\$ CAN) before taxes

Applicable Index*:

1	Machinery and equipment (P72)	<u>Statistics Canada. Table 18-10-0265-01 Industrial product price index, by major product group, monthly</u>	Industrial product price index, by major product group, monthly (statcan.gc.ca)
2	Electrical, electronic, audiovisual and telecommunications products (P73)	<u>Statistics Canada. Table 18-10-0265-01 Industrial product price index, by major product group, monthly</u>	Industrial product price index, by major product group, monthly (statcan.gc.ca)
3	<i>Energy and petroleum products (P51)</i>	<i><u>Statistics Canada. Table 18-10-0265-01 Industrial product price index, by major product group, monthly</u></i>	<i>Industrial product price index, by major product group, monthly (statcan.gc.ca)</i>
4	<i>Fabricated metal products and construction materials (P63)</i>	<i><u>Statistics Canada. Table 18-10-0265-01 Industrial product price index, by major product group, monthly</u></i>	<i>Industrial product price index, by major product group, monthly (statcan.gc.ca)</i>

- The Contractor must indicate the total economic price adjustment amounts (whether they are upward, downward or present no change) as a separate item on each claim for payment submitted under the Contract. Where an adjustment applies, the Contractor must submit with their claim for payment form PWGSC-TPSGC EPA, Claim for Economic Price Adjustment (EPA).
- Canada reserves the right to audit any revision to costs and prices under this clause.

7.6.6 Exchange rate fluctuation adjustment

- The foreign currency component (FCC) is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuation. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.
- For each line item where a FCC is identified (where column 5 quantity is 1 of form PWGSC-TPSGC 450), Canada assumes the risks and benefits for exchange rate fluctuation, as shown in the Basis of Payment. For such items, the exchange rate fluctuation amount is determined in accordance with the provision of this clause.
- The total price paid by Canada on each invoice will be adjusted at the time of payment. The exchange rate adjustment amount will be calculated in accordance with the following formula:
Exchange rate adjustment = FCC x Qty x (%) x ($i_1 - i_0$) / i_0 , where formula variables correspond to:

FCC

Foreign currency component (per unit), before taxes

Quantity (Qty)

quantity of units

(%)

Items requiring a percentage to be included by the bidder, in column 3b, to establish the portion of the FCC in column 3a, that corresponds to the description in column 2a.

i₀

Initial exchange rate (CAN\$ per unit of foreign currency [for example US\$1]).

The initial exchange rate is set as the Bank of Canada rate on the solicitation closing date. The Bank of Canada publishes its rates each business day by 16:30 Eastern Time.

i₁

Exchange rate for adjustments (ERA) (CAN\$ per unit of foreign currency [for example US\$1]). The Bank of Canada publishes its rates each business day by 16:30 Eastern Time.

- a. The ERA for goods will be the Bank of Canada rate on the date the goods were delivered.
 - b. The ERA for services will be the Bank of Canada rate on the last business day of the month for which the services were performed.
 - c. The ERA for advance payments will be the Bank of Canada rate on the last business day prior to the payment. The last published business day rate will be used for non-business days.
4. The Contractor must indicate the total exchange rate adjustment amounts (whether they are upward, downward or present no change) as a separate item on each claim for payment submitted under the Contract. Where an adjustment applies, the Contractor must submit with their claim for payment form PWGSC-TPSGC 450 (part of Annex R - Economic Price Adjustment and Exchange Rate Adjustment - Sheet), Claim for Exchange Rate Adjustments.
5. Canada reserves the right to audit any revision to costs and prices under this clause.

7.7 Invoicing Instructions

7.7.1 Invoices

1. Invoices are to be made out to:

Canadian Coast Guard - Small Vessel Portfolio
SVP@dfo-mpo.gc.ca
Attention of: TBD

And;

The original invoice to be forwarded for verification to:

Public Works and Government Services Canada
Marine Systems Directorate
Marine Construction Division
Contract Authority
Attention: Stephane Deslauriers
Email: stephane.deslauriers@tpsgc-pwgsc.gc.ca

One (1) extra copy must be sent to the Technical Authority as identified at section 7.5.2.

2. Canada will only make payment upon receipt of a satisfactory invoice duly supported by specified release documents and any other documents required by the Contract.
3. The Contractor must not submit an invoice prior to the completion and acceptance of the Work or shipment of the items to which it relates.

4. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment.

Each claim must show:

- a. all information required on form PWGSC-TPSGC 1111;
- b. all applicable information detailed under the section entitled "Invoice Submission" of the general conditions; and
- c. the description and value of the milestone claimed as detailed in the Contract.

Applicable Taxes must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no Applicable Taxes payable as it was claimed and payable under the previous claims for progress payments.

7.7.2 Electronic Payment of Invoices – Contract

The Contractor accepts to be paid using Direct Deposit (Domestic and International) as the payment instrument.

7.8 Certifications

7.8.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

7.8.2 Welding Certification

1. The Contractor must ensure that welding is performed by a welder certified by the Canadian Welding Bureau (CWB) in accordance with the requirements of the following Canadian Standards Association (CSA) standards:

- (a) CSA W47.1 - Latest Edition, Certification for Companies for Fusion Welding of Steel (Division Level 1 or 2) including the implementation of the Marine Annex in the Company's scope of Operations (for example, Marine Operations);

and

- (b) CSA W47.2 - Latest Edition, Certification for Companies for Fusion Welding of Aluminum (Division Level 1 or 2).

2. In addition, welding must be done in accordance with the requirements of the applicable drawings and specifications.
3. Before the commencement of any fabrication work, and upon request from the Technical Authority, the Contractor must provide approved welding procedures and a list of welding personnel intended to be used in the completion of the work. The list must identify the CWB welding procedure qualifications attained by each of the personnel listed and must be accompanied by a copy of each person's current CWB welding certification.

7.8.3 Workers Compensation

The Contractor must maintain its account in good standing with the applicable provincial or territorial Workers' Compensation Board for the duration of the Contract.

7.9 Federal Contractors Program for Employment Equity - Default by the Contractor

The Contractor understands and agrees that, when an Agreement to Implement Employment Equity (AIEE) exists between the Contractor and Employment and Social Development Canada (ESDC)-Labour, the AIEE must remain valid during the entire period of the Contract. If the AIEE becomes invalid, the name of the Contractor will be added to the "FCP Limited Eligibility to Bid" list. The imposition of such a sanction by ESDC will constitute the Contractor in default as per the terms of the Contract.

7.10 Project Schedule

1. The Contractor must provide a detailed project schedule in accordance with Annex "A" SOW, CDRL-M-002, DID-M-002 Integrated Master Schedule
2. The schedule is to be regularly updated and available in the Contractor's office for review by Canada's authorities to determine the progress of the Work.

7.11 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____. (insert the name of the province or territory as specified by the Bidder in its bid, if applicable).

7.12 Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- a) the Articles of Agreement;
- b) the supplemental general conditions 1028 (2010-08-16), Ship Construction – Firm Price;
- c) the Supplemental General Conditions 4006 (2010-08-16) Contractor to Own Intellectual Property Rights in Foreground Information;
- d) the General Conditions 2030, (2020-05-28) , General Conditions - Higher Complexity – Goods;
- e) the General Conditions 1031-2, (2012-07-16), Contract Cost Principles;
- f) Annex "A", Statement of Work (SOW);
- g) Annex "B", Basis of Payment;
- h) Annex "C", Federal Contractors Program for Employment Equity - Bid Certification
- i) Annex "D", List of Subcontractors;
- j) Annex "E", Bidders Questions and Canada's Responses (if applicable);
- k) Annex "F", Insurance Requirements;
- l) Annex "G", Procedure for Unscheduled Work;
- m) Annex "H", Warranty;
- n) Annex "I", Forms
- o) Annex "J", General information on Indigenous Participation Component;
- p) Annex "K", Indigenous Participation Component Certification Forms;
- q) Annex "L", The Indigenous Participation Component (IPC) Plan;
- r) Annex "M", Indigenous Certification Requirements;
- s) Annex "N", Indigenous Participation Component Reports;
- t) Annex "R", Economic Price Adjustment and Exchange Rate Adjustment;
- u) the Contractor's bid dated _____ (insert date of bid), as amended _____ (insert date(s) of amendment(s) if applicable).

7.13 Insurance Requirements

The Contractor must comply with the insurance requirements specified in Annex "F" – Insurance Requirements. The Contractor must maintain the required insurance coverage for the duration of the Contract. Compliance with the insurance requirements does not release the Contractor from or reduce its liability under the Contract.

The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfil its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

The Contractor must forward to the Contracting Authority within ten (10) days after the date of award of the Contract, a Certificate of Insurance evidencing the insurance coverage and confirming that the insurance policy complying with the requirements is in force. Coverage must be placed with an Insurer licensed to carry out business in Canada. The Contractor must, if requested by the Contracting Authority, forward to Canada a certified true copy of all applicable insurance policies.

7.14 Limitation of Contractor's Liability for Damages to Canada

1. This section applies despite any other provision of the Contract and replaces the section of the general conditions entitled "Liability". Any reference in this section to damages caused by the Contractor also includes damages caused by its employees, as well as its subcontractors, agents, and representatives, and any of their employees.
2. Whether the claim is based in contract, tort, or another cause of action, the Contractor's liability for all damages suffered by Canada caused by the Contractor's performance of or failure to perform the Contract is limited to \$10 million per incident or occurrence to an annual aggregate of \$20 million for losses or damages caused in any one year of carrying out the Contract, each year starting on the date of coming into force of the Contract or its anniversary. This limitation of the Contractor's liability does not apply to nor include:
 - a) Any infringement of intellectual property rights;
 - b) Any breach of warranty obligations;
 - c) Any liability of Canada to a third party arising from any act or omission of the Contractor in performing the Contract; or
 - d) Any loss for which the policies of insurance specified in the Contract or any other policies of insurance held by the Contractor would provide insurance coverage.
3. Each Party agrees that it is fully liable for any damages that it causes to any third party in connection with the Contract, regardless of whether the third party makes its claim against Canada or the Contractor. If Canada is required, as a result of joint and several liability, to pay a third party in respect of damages caused by the Contractor, the Contractor must reimburse Canada for that amount.
4. The Parties agree that nothing herein is intended to limit any insurable interest of the Contractor nor to limit the amounts otherwise recoverable under any insurance policy. The Parties agree that to the extent that the insurance coverage required to be maintained by the Contractor under this Contract or any additional insurance coverage maintained by the Contractor, whichever is greater, is more than the limitations of liability described in sub-article (2), the limitations provided herein are increased accordingly and the Contractor shall be liable for the higher amount to the full extent of the insurance proceeds recovered.
5. If, at any time, the total cumulative liability of the Contractor for losses or damage suffered by Canada caused by the Contractor's performance of or failure to perform the Contract, excluding liability described under subsection 2(a), (b), (c) and (d) exceeds \$40 million, either Party may terminate the Contract by giving notice in writing to the other Party and neither Party will make any claim against the other for damages, costs, expected profits or any other such loss arising out of the termination. However, no such termination or expiry of the Contract shall reduce or terminate any of the liabilities that have accrued to the effective date of the termination but which liabilities are subject to the limitations as specified in sub-article 1) through 4) above.
6. The date of termination pursuant to this Article, shall be the date specified by Canada in its notice to terminate, or, if the Contractor exercises the right to terminate, in a notice to the Contractor from Canada in response to the Contractor's notice to terminate. The date of termination shall be in Canada's discretion.

to a maximum of 12 months after service of the original notice to terminate served by either Party pursuant to sub-article 5, above.

7. Nothing limits Canada's other remedies, including Canada's right to terminate the Contract for default for breach by the Contractor of any of its obligations under this Contract, notwithstanding that the Contractor may have reached any limitation of its liability hereunder.

7.15 Foreign Nationals (Canadian Contractor)

The Contractor must comply with Canadian immigration requirements applicable to foreign nationals entering Canada to work temporarily in fulfillment of the Contract. If the Contractor wishes to hire a foreign national to work in Canada to fulfill the Contract, the Contractor should immediately contact the nearest Service Canada regional office to enquire about Citizenship and Immigration Canada's requirements to issue a temporary work permit to a foreign national. The Contractor is responsible for all costs incurred as a result of non-compliance with immigration requirements.

7.16 Subcontracts and Subcontractor List

The Contractor must notify the Contracting Authority, in writing, of any changes to the list of subcontractors before commencing the Work.

When the Contractor subcontracts work, a copy of the subcontract purchase order must be provided to the Contracting Authority. In addition, the Contractor must monitor progress of subcontracted work and inform the Inspection Authority on pertinent stages of work to permit inspection when considered necessary by the Inspection Authority.

7.17 Trade Qualifications

The Contractor must use qualified, certificated (if applicable) and competent tradespeople and supervision to ensure a uniform high level of workmanship. The Technical Authority may request to view and record details of the certification and/or qualifications held by the Contractor's tradespeople. This request should not be unduly exercised but only to ensure qualified tradespeople are on the job.

7.18 ISO 9001:2015 - Quality Management Systems

In the performance of the Work described in the Contract, the Contractor must comply with the requirements of :

ISO 9001:2015- Quality management systems - Requirements, published by the International Organization for Standardization (ISO), current edition at date of submission of Contractor's bid.

The Contractor's quality management system must address each requirement contained in the standard.

7.19 Quality Control Plan

The Contractor must implement and follow the Quality Control Plan (QCP) prepared according to the latest issue (at contract date) of ISO 10005:2005 Quality management - Guidelines for quality plans, approved by the Inspection and the Technical Authority. The QCP must describe how the Contractor will conform to the specified quality requirements of the Contract and specify how the required quality activities are to be carried out, including quality assurance of subcontractors. The Contractor must include a traceability matrix from the elements of the specified quality requirements to the corresponding paragraphs in the QCP. The QCP must be made available to the Inspection and Technical Authority for review and approval within thirty (30) business days after contract award.

The documents referenced in the QCP must be made available when requested by the Inspection Authority.

The Contractor must make appropriate amendments to the QCP throughout the duration of the Contract to reflect current and planned quality activities. Amendments to the QCP must be acceptable to the Inspection Authority and the Technical Authority.

In addition, refer to DID Q-001 Quality Plan.

7.20 Inspection and Test Plan

The Contractor must, in support of its Quality Control Plan (QCP), implement an approved Inspection and Test Plan (ITP). The ITP must be made available to the Inspection and Technical Authority for review and approval thirty (30) business days before the build phase.

The Contractor must provide, at no additional cost to Canada, all applicable test data, all Contractor technical data, test pieces and samples as may reasonably be required by the Inspection Authority to verify conformance to contract requirements. The Contractor must forward at its expense such technical data, test data, test pieces and samples to such location as the Inspection Authority may direct.

In addition, refer to Q-002 Inspection Plan.

7.21 Equipment/Systems: Inspection/Test

Inspections, Tests and Trials of Equipment, Machinery and Systems must be conducted in accordance with the Specification. The Contractor is responsible for performing, or having performed, all Inspections, Tests and Trials necessary to substantiate that the materiel and services provided conform to contract requirements.

In addition, refer to DID Q-003 Tests and Trials Plan.

7.22 Environmental Protection

The Contractor and its subcontractors engaged in the Work on a Canada's vessel must carry out the Work in compliance with applicable municipal, provincial and federal environmental laws, regulations and industry standards.

The Contractor must have detailed procedures and processes for identifying, removing, tracking, storing, transporting and disposing of all potential pollutants and hazardous material encountered, to ensure compliance as required above. The Contractor must maintain in force its Environmental Protection procedures through the course of the Contract.

All waste disposal certificates must be provided to the Technical Authority, with information copies sent to the Contracting Authority. Furthermore, additional evidence of compliance with municipal, provincial and federal environmental laws and regulations must be furnished by the Contractor to the Contracting Authority when so requested.

The Contractor must have environmental emergency response plans and/or procedures in place. Contractor and subcontractor employees must have received the appropriate training in emergency preparedness and response. Contractor personnel engaging in activities which may cause environmental impacts or potential non compliance situations must be competent to do so on the basis of appropriate education, training, or experience.

7.23 Fire Protection, Fire Fighting and Training

The Contractor must maintain in force its fire protection, fire fighting and training procedures through the duration of the Contract.

7.24 Procedures for Design Change or Additional Work

The Contractor hereby acknowledges that Canada may require the Contractor to perform additional Work at any time and from time to time, during this Contract over and above the Work identified at Annex "A". The additional Work could include but not be limited to:

- (a) Additions or variations to the Work including Design Changes; and
- (b) Dispensing with or change to any portion of the Work.

If any additional Work is required, the procedure for processing the "Additional Work" shall be as set out in clause B5007C dated 2010-01-11, All negotiations must be completed and the additional Work authorized on form PWGSC - TPSGC 1686 prior to the commencement of the Work, unless and until the Contracting Authority specifically authorizes commencement of the additional Work, in writing, prior to completion of negotiations and completion of form PWGSC - TPSGC 1686.

The Contractor shall perform the additional Work under the same terms and conditions of the Contract. The additional Work will be negotiated using the labor rates and markups contained in the Contract.

The Contractor may request a change to the Work for Canada's consideration by submission of a request for change proposal to the Contracting Authority.

Extensions in the delivery date as a result of the approved additional (unscheduled) Work must be presented at the time of the proposal and to the satisfaction of the Contracting Authority, otherwise extensions to the delivery date will not be considered.

No cost additional Work: Notwithstanding the foregoing, should Canada deem it advisable to make any reasonable change in the Work during the course of the Work, provided the change is ordered before that particular part of the Work to which Canada refers is commenced and involves no extra cost to the Contractor, such changes shall be made by the Contractor without extra cost to Canada.

Incorporation of Additional Work or Design Changes: Where additional Work including Design Changes has been agreed to by the Parties, the resulting change shall be incorporated into the Work, and:

- (a) Be subject to all of the provisions of the Contract;
- (b) Not relieve the Contractor of its obligation to ensure that the Vessel meets all of the performance requirements set out in the Systems Requirements Document and shall not affect the delivery date unless otherwise provided for in form PWGSC - TPSGC 1686 relating to such additional work or design change.

In addition, refer to Annex "F" - Procedure for Unscheduled Work.

7.25 Contract Kickoff Meeting

Within **fifteen (15) working days** of the award of the contract, the Contractor must contact the Contracting Authority to confirm the scheduling of the Contract Kick-off meeting. The meeting shall be in accordance with the Annex "A" SOW. The meeting will be held at the Contractor's facility. Cost of holding the meeting must be included in the price of the bid. Please note that the travel and living expenses for Government Personnel will be arranged and paid for by Canada.

7.26 Progress Review Meetings (PRM) and Technical Review Meetings (TRM)

The Contractor must convene PRMs and TRMs every six (6) weeks to be held via teleconference or in person at the Contractor's facilities. The purpose of the PRMs is to discuss cost, schedule, quality of the Work, progress, risks, issues and any other topics that affect the conduct of the Work. The PRM attendees from Canada will include the Contracting Authority, Technical Authority, and Inspection Authority and other attendees as indicated by Canada. The purpose of the TRMs is to discuss and resolve any technical issues with the design, system engineering, construction, ILS and any other technical issues that affect the progress of the Work. Canada's participants for the TRM must include the Contracting Authority, Technical Authority, Inspection Authority, and other attendees as indicated by Canada.

In addition, refer to Annex "A" – Statement of Work.

7.27 Delivery and Acceptance Process

The acceptance process is defined in DID Q-006 Acceptance Plan.

The Contractor shall deliver (any INCO terms) the NSFRV upright, stable, seaworthy, afloat alongside and ready for Acceptance by Canada at the the Canadian Coast Guard Base in Sorel, Quebec, having achieved Provisional Acceptance at the Contractor's shipyard prior thereto.

Provisional Acceptance means complete in all respects ready for shipping with all respective tests and trials and demonstrations and certifications successfully completed to the satisfaction of the Inspection Authority (IA), Contracting Authority (CA) and Technical Authority (TA) and in accordance with the Contract. After successful Provisional Acceptance at the Contractor's shipyard, the Contractor shall deliver for Acceptance by Canada at the Canadian Coast Guard Base in Sorel, Quebec.

Upon completion of all tests and trials specified in Annex A - Statement of Requirements, the Contractor shall submit a certificate of Provisional Acceptance included in Annex "I" Forms , to be signed by the authorized representative of the Contractor, the Inspection Authority and the Contracting Authority. In addition, the Inspection Authority will prepare a final list of all outstanding Work items (including non-conformance reports) for review at the Provisional Acceptance Conference and attached to the Provisional Acceptance certificate as an appendix. The list of outstanding Work shall be reviewed to determine if the NSFRV is/are fully operational for its intended service to the satisfaction of Canada. Upon receipt of a signed copy of the Provisional Acceptance certificate by the Contracting Authority, the Contractor shall proceed with delivery of the boat to the specified location for Acceptance by Canada.

Each outstanding Work item on the list referred to above shall have a price determined in accordance with the following: the higher of twice the cost for the outstanding Work to be completed by the Contractor, or twice the cost for the outstanding Work to be completed as quoted by a third party, and that amount shall be deducted from any payment otherwise due.

It is understood and agreed that where the Work has been substantially completed and the parties have agreed upon the terms and conditions for the Contractor to make good all deficiencies, the certificate may be executed with a statement attached concerning the making good of the deficiencies.

Acceptance of the NSFRV by the Minister shall occur with a written execution of a certificate in accordance with form PWGSC-TPSGC 1105 included in Annex "I" Forms, with evidence satisfactory to Canada that the NSFRV has successfully completed all Tests and Trials and Demonstrations and Certification. The execution of the Certificate shall in no way relieve the Contractor of its obligations under the Contract.

7.28 Scrap and Waste Material

Despite any other provision of the Contract, scrap and waste materials other than accountable material, derived from the Contract, will revert to the Contractor as part of the Contract Price.

7.29 Vessel Access by Canada

Canada reserves the right to have its personnel carry out limited work on equipment on board the vessel. This work will be carried out at times mutually acceptable to Canada and the Contractor.

7.30 Workers Compensation

The Contractor must maintain its account in good standing with the applicable provincial or territorial Workers' Compensation Board for the duration of the Contract.

7.31 Dispute Resolution

The parties agree to follow the procedures below for the settlement of any disputes which may arise throughout the duration of this Contract prior to seeking redress through court procedures:

- a) Disputes arising from this Contract will in the first instance be resolved by the Contracting Authority and the Contractor's Contract Administrator within 15 working days or such additional time as may be agreed to by both parties.
- b) Failing resolution under (a) above, the Manager of the Small Vessel Construction (MC) Directorate at PWGSC and the Contractor's Representative Supervisor will attempt to resolve the dispute within an additional fifteen (15) working days.
- c) Failing resolution under (a) or (b) above, the Senior Director of the Marine Systems Directorate at PWGSC, and the Contractor's Senior Management will attempt to resolve the dispute within an additional thirty (30) working days.
- d) Notwithstanding the above procedure, either party may seek a decision through the courts at any time during the dispute.

7.32 Drawings

The Contractor must prepare and submit to Canada the as-fitted drawings, calculations and associated lists in accordance with DID I-019 As-Fitted Drawing Package. The Contractor must maintain and control the configuration of the drawings to reflect the Work under this Contract until the end of the Warranty period for the Vessel.

In addition, refer to Annex "A" – Statement of Work.

7.33 Export Licenses

Where material is to be imported into Canada, the Contractor is responsible for obtaining all necessary export licenses from the country of origin in sufficient time to enable the export.

7.34 Travel and Living Expenses - National Joint Council Travel Directive

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the National Joint Council Travel Directive and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Contracting Authority.

All payments are subject to government audit.

7.35 Indigenous Participation Component

- a) The Contractor must comply with the Indigenous Participation Component (IPC) as detailed in Annex "J", "K" (Part 1 & Part 2), "L", "M" (Forms 1 and 2) and "N".
- b) The Contractor warrants that the certification of compliance with the definition of an Indigenous business set out in the Requirements for the Set-aside Program for Indigenous Business submitted by the Contractor is accurate and complete, as detailed in Annex "M", Form 1 and Form 2.
- c) The Contractor must keep proper records and documentation relating to the accuracy of the certification provided to Canada. The Contractor must not, without obtaining prior written consent of the Contracting

Authority, dispose of any such records or documentation supporting the accuracy of the certification until the expiration of six years after final payment under the Contract, or until settlement of all outstanding claims and disputes, resulting from a dispute under the Contract, whichever is later. All such records and documentation must at all times during the retention period be open to audit, inspection and examination by representatives of Canada, who may make copies and take extracts. The Contractor must provide all facilities for such audits, inspections and examinations, and must furnish all such information as the representatives of Canada may from time to time require with respect to such records and documentation.

- d) Nothing in this clause must be interpreted as limiting the rights and remedies which Canada may otherwise have pursuant to the Contract.

7.36 Total System Vessel Responsibility

Notwithstanding the section 9.1 of the Statement of Work in Annex "A" the Contractor must maintain Total System Vessel Responsibility (TSVR) for the Work performed by or on behalf of the Contractor under this Contract. TSVR includes but is not limited to:

- i. a system design and total system integration which includes the task of aggregating interconnecting, setting-to-work, testing, trials and making compatible all the Systems and Deliverables, including their associated software, so as to fulfil the performance and other requirements described in this SOW;
- ii. placement and management of sub-contractors;
- iii. ensuring that documentation and publications are sufficient to permit operation and maintenance of the systems and equipment which they depict;
- iv. ensuring the Contractor recommendations regarding spare parts are compatible with the systems and equipment components for which they are designed; and
- v. all other work required to ensure the NSFRV is fully functional and meets all the requirements of the Contract.

7.37 Failure to Deliver

Time is of the essence for this Contract. Failure to deliver by the date(s) specified in the Contract will prejudice Canada.

Delivery is an essential part of this contract. Except for excusable delays notified in accordance with Section 11 of 2030 General Conditions - Higher Complexity - Goods, failure to deliver by the date(s) specified in this Contract will prejudice the Government of Canada and will, at the Government of Canada's discretion, entail either:

- a) Contract Termination in accordance with 2030 General Conditions Sections 10 (Time of the Essence) and 31 (Default by the Contractor); or
- b) Consideration for Contract Amendment. Delivery date(s) will not be extended without consideration being provided by the Contractor in the form of adjustment to the price, warranty, quantity and / or service to be provided.

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ANNEX "A" - STATEMENT OF WORK

Near Shore Fishery Research Vessel (NSFRV)

Build Contract

The SOW, DIDs and the CDRL are included below

ANNEX "B" - BASIS OF PAYMENT

B1 Contract Firm Price

Price Evaluation

All firm prices and hourly rates must be in Canadian dollars, Canadian customs duty and excise tax included, Incoterms 2000 Delivered Duty Paid (DDP) to the delivery points identified, GST and HST extra, as applicable.

Price Table 1

		Column A	Column B	Column C
Item #	Description	Price CDN\$		
1	NSFRV	\$		
2	Transportation Cost of the NSFRV to the CCG base at Sorel, Quebec	\$		
3	Technical Data Package for the NSFRV	\$		
4	Training for the NSFRV	\$		
5	One (1) year operational spares for the NSFRV	\$		
Subtotal A	Total Contract Price (sum column A item #1-#5)	\$		
	The indicated number # of hours for items 7 and 8 below are for evaluation purposes only. The Hourly Rate is a firm rate for the duration of the contract.			
Item #	Description	Hourly Rate hrs CDN\$	Quantity Per item	Total CDNS
7	All other services	\$	100	\$
8	Administration	\$	100	\$
	Total Evaluated Price (Sum of subtotal A plus items #7 and 8)	\$		\$

1. Charge-out Rate / Material Mark-up

The following rates are included in the Basis of Payment and must remain valid for the duration of the contract:

The Charge-out Rates specified below include; All other services, Administration and must be inclusive of all overheads and profit. The Charge-out Rates will be used for pricing unscheduled work that results in an increase or decrease during the Work Period, except as noted in the clause entitled "Overtime."

Charge-out Rates as per Price Table 1

Description	Hourly Rate CDN\$ (A)
All other services	\$
Administration	\$

The cost of material must be the net laid-down cost of the material to which must be added a mark-up of 10% of the net laid-down cost of the material. For the purposes of pricing, Unscheduled Work and material must be deemed to include subcontracts.

2. Overtime:

In the event Canada authorizes overtime for Unscheduled Work, the applicable overtime rates as defined below shall be applied to the hourly rates found in section 1. Charge-out Rate / Material Mark-up , GST/HST extra, as applicable.

Overtime is defined as:

Regular time is defined as an 8 hour work day or in accordance with current employment contract; Overtime Time and One-Half Rate (1.5x the hourly rate (A) found in section 1 above is defined as time in excess of the regular time; and

Overtime Double Time Rate (2.0 x the hourly rate (A) found in section 1 above if applicable under current employment contract.

3. Labor Rates for Additional Work including Design Change

For the performance of the Work as a result of approved additional Work including Design, or Engineering Change, All other services, Administration or change in the scope of Work, the Contractor shall be paid the firm hourly charge-out rate as detailed in section 1. Charge-out Rate / Material Mark-up, GST/HST extra, as applicable.

The firm hourly charge-out labour rates will remain firm for the term of the Contract and any subsequent amendments.

4. Material for Additional Work including Design Change

For the performance of the Work to procure additional Material as a result of approved additional Work including Design Change or change in the scope of Work, the Contractor shall be paid the Direct Material Cost as defined in Contract Cost Principles 1031-2 plus a firm mark-up of 10% GST/HST extra, as applicable. Other than the 10% mark-up, no additional charges relating to material procurement, insurance, handling, store keeping and activities of this nature, or any other charge whatsoever, will be accepted as part of the additional Work prices.

The material mark-up rate will also apply to subcontracted costs. The mark-up rate includes any allowance for material and subcontract management not allowed for in the Charge-out Labour Rate. The Contractor will not be entitled to a separate labour component for the purchase and handling of materials or subcontract administration.

The material mark-up rate will remain firm for the term of the Contract and any subsequent amendments.

5. Payment for Additional Work including Design Change

The Contractor may claim payment for Additional Work including Design Change where the Work involved in the additional Work or Design Change has been initiated, fully in accordance with the provisions of the Contract. Each additional Work package or Design Change is to be divided over the

entire Contract period proportionately to each payment set out in the Contract. Payment for Additional Work or Design Change shall be subject to the same conditions herein.

MILESTONE PAYMENT SCHEDULE

The schedule of milestones for which payments will be made in accordance with the Contract.

Contract Total is the sum of the milestone payment schedule below: \$____ enter at contract award ____

Table B2: Milestone Payments

Milestone #	Description of Milestone	%	Firm Unit Price (applicable taxes extra)	Total Firm Price (applicable taxes extra)
	Phase 1 – Design Completion	10%		
1	Kick-Off Meeting: As per SOW requirement 7.1.2 and 11.7.1	0.75%	\$	\$
2	Phase 1A: Design Review completed and accepted by Canada. As per SOW 7.1.2 to 7.1.4 and 7.1.8; DID T-001 Design Review Reports	2.75%	\$	\$
3	Phase 1B: Continued Design Development completed and accepted by Canada. As per SOW 7.1.5, 7.1.6 and 7.1.8; DID T-005 Technical Baseline	3%	\$	\$
4	Phase 1C: Production Engineering completed and accepted by Canada. As per SOW 7.1.8	3.5%	\$	\$
	Phase 2 - Build	72%		
5	Ordering of material of structural steel and aluminum by weight	2%	\$	\$
6	Delivery of material of structural steel and aluminum by weight	8%	\$	\$
7	Ordering of Propulsion Machinery by ship set to shipyard - prime	2%	\$	\$
8	Delivery of Propulsion Machinery by ship set to shipyard - prime	6%	\$	\$
9	Ordering of Electrical Equipment Package by ship set - generator sets, main switchboard and energy storage system (ESS)	2%	\$	\$

10	Delivery of Electrical Equipment Package by ship set - generator sets, mainswitchboard and energy storage system (ESS)	7%	\$	\$
11	Hull, deck and wheelhouse enclosed and accepted by Canada	15%	\$	\$
12	Prime movers installed in vessel	6%	\$	\$
13	Prime movers accepted by Canada	4%	\$	\$
14	Vessel outfitting has been installed and accepted by Canada	10%	\$	\$
15	Vessel completed and ready to launch	10%	\$	\$
	Delivery and Acceptance	18%	\$	\$
16	Vessel launched, all Test and Trials completed and accepted by Canada	5%	\$	\$
17	Provisional Acceptance complete and accepted by Canada	3%	\$	\$
18	Delivery and Acceptance at destination	3%	\$	\$
19	Delivery of operational spares	1%	\$	\$
20	All Technical Data Package elements delivered and accepted by Canada	1%	\$	\$
21	All Training completed and accepted by Canada	1%	\$	\$
22	Completion of the 12 month warranty period and the 2 year period for the entire mechanical and electrical components of the power train, power train resilient mountings and any sub-bases incorporated into the propulsion engine or gearing arrangements	3%	\$	\$
23.a	Completion of Aboriginal Voluntary Set A-side report which demonstrates 0.5% of the Contract Price which has been met and the reports are accepted	0.50%	\$	\$
23.b	Completion of Aboriginal Voluntary Set A-side report which demonstrates a full 0.5% of the Contract Price which has been met and the reports are accepted by Canada	0.50%	\$	\$

The Milestones shown above will be included and identified in all production schedules. Milestone Payment Claims may be submitted if all requirements for the milestone payment have been completed and accepted by Canada.

The payment for the vessel delivered, **Milestones 18** will be payable by Canada upon delivery and acceptance of the Vessel by Canada, minus the holdback for double the total estimated value of any outstanding Work items as explained at section 7.27.

The Holdback for outstanding Work will be payable by Canada upon completion of the outstanding Work and when the Work is accepted by Canada

The payment for completion of the twelve (12) months warranty period and the twenty-four (24) months period for the entire mechanical and electrical components of the power train, power train resilient mountings and any sub-bases incorporated into the propulsion engine or gearing arrangements. **Milestones 22** will be payable by Canada upon completion of the warranty period, minus the total cost of any Work undertaken by Canada to repair any defects subject to warranty.

Note: Technical Manuals will not be returned once approved.

6. Expenditure, Limitation - Contract

Canada's total liability under this Contract shall not exceed \$ **TBD** , Goods and Services Tax or Harmonized Sales Tax (GST/HST) extra, as appropriate.

No increase in the total liability of Canada or in the price of Work resulting from any design changes, modifications or interpretations of Annex "A", made by the Contractor, will be authorized or paid to the Contractor unless such changes, modifications or interpretations, have been approved, in writing, by the Contracting Authority, prior to their incorporation into the Work. The Contractor shall not be obliged to perform any Work or provide any service that would cause the total liability of Canada to be exceeded without the prior written approval of the Contracting Authority.

Cost Breakdown

1. Bidders must include with their financial bid a cost breakdown of its bid price for the Work. Each item of work or services in below from Annex "A", is to be priced individually to indicate labour, material, overhead and profit.
2. The cost breakdown must itemize all costs included in its price for the Work in accordance with the Bidder's cost accounting or cost schedule system. Alternatively, Bidders may complete the attached **Annex "B"** which is the minimum amount of information required.
3. The information submitted as a mandatory item will be held as confidential business information. The details of this information may be used for contractual evaluation purposes and/or contract administration purposes.

Table: Cost Breakdown

Sect of SOW	Description	Labour	Material	Overhead and Profit	Total
SOW Section 7.1.6	Hull/Deck Structure - Steel	\$	\$	\$	\$
SOW Section 7.1.6	Deckhouse/Wheelhouse Structure - Aluminium	\$	\$	\$	\$
SOW Section 9.1	AKA Package	\$	\$	\$	\$
SOW Section 9.1	Hawboldt Package	\$	\$	\$	\$
SOW Section 9.1	A-Frame	\$	\$	\$	\$
SOW Section 9.1	Trawl Winches (2x)	\$	\$	\$	\$
SOW Section 9.1	Crane	\$	\$	\$	\$
SOW Section 9.1	CTD Winch	\$	\$	\$	\$

SOW Section 9.1	Control Equipment (Chair, Console, Display)	\$	\$	\$	\$
SOW Section 9.1	Side J-Frame	\$	\$	\$	\$
SOW Section 9.1	Powering (Associated electric deck equipment VFDs, or drives, with power regeneration)	\$	\$	\$	\$
SOW Section 9.1	Sheaves	\$	\$	\$	\$
SOW Section 9.1	Propulsion Drives (SRE 210LECFP)	\$	\$	\$	\$
SOW Section 9.1	Propulsion Motors (2x)	\$	\$	\$	\$
SOW Section 9.1	Azimuthing Thrusters (STT60)	\$	\$	\$	\$
SOW Section 9.1	Diesel Electric Generators CAT C18 (2x)	\$	\$	\$	\$
SOW Section 9.1	Switchboards (2x) (900 and 480 VDC)	\$	\$	\$	\$
SOW Section 9.1	Energy Storage System (ESS)	\$	\$	\$	\$
SOW Section 9.1	Conversion equipment for ESS (chargers, inverters, converters and transformers)	\$	\$	\$	\$
SOW Section 9.1	Power management and distribution software	\$	\$	\$	\$
	Navigation echo sounder	\$	\$	\$	\$
	Differential global positioning system (DGPS)	\$	\$	\$	\$
	Scientific Fishing Echo Sounder (Simrad EK80)	\$	\$	\$	\$
	Scientific Fishing Sonar (Simrad SY50)	\$	\$	\$	\$
	Multibeam hydrographic sonar (Kongsberg EM2040 MKII)	\$	\$	\$	\$
	Gyro Stabilizers (VEEM VG140/260SD) (2x)	\$	\$	\$	\$
	TOTAL	\$	\$	\$	\$

ANNEX "C" Federal Contractors Program for Employment Equity - Bid Certification

I, the Bidder, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada will declare a bid non-responsive, or will declare a contractor in default, if a certification is found to be untrue, whether during the bid evaluation period or during the contract period. Canada will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with any request or requirement imposed by Canada may render the bid non-responsive or constitute a default under the Contract.

For further information on the Federal Contractors Program for Employment Equity visit Employment and Social Development Canada (ESDC) – Labour's website
(http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page).

Date: _____ (YYYY/MM/DD) (If left blank, the date will be deemed to be the bid solicitation closing date.) Complete both A and B.

A. Check only one of the following:

() A1. The Bidder certifies having no work force in

Canada. () A2. The Bidder certifies being a public sector employer.

() A3. The Bidder certifies being a federally regulated employer being subject to the Employment Equity Act.

() A4. The Bidder certifies having a combined work force in Canada of less than 100 employees (combined work force includes: permanent full-time, permanent part-time and temporary employees [temporary employees only includes those who have worked 12 weeks or more during a calendar year and who are not full-time students]).

A5. The Bidder has a combined workforce in Canada of 100 or more employees; and

() A5.1. The Bidder certifies already having a valid and current Agreement to Implement Employment Equity (AIEE) in place with ESDC-Labour.

OR

() A5.2. The Bidder certifies having submitted the Agreement to Implement Employment Equity (LAB1168) to ESDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to ESDC-Labour.

B. Check only one of the following:

() B1. The Bidder is not a Joint Venture.

OR

() B2. The Bidder is a Joint venture and each member of the Joint Venture must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the Standard Instructions).

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ANNEX "D"

LIST OF SUBCONTRACTORS

List of subcontractors for labour and material over \$50,000.00 must be included with the Bidder's Proposal, stating the name and address of each subcontractor, and a description (Make, Model No.) of the goods or services to be supplied.

SOW item number	Description of Goods/Services (Including Make/Model as applicable)	Name of Subcontractor	Address of Subcontractor

ANNEX "E"

BIDDER'S QUESTIONS AND CANADA'S RESPONSES

Q1. In connection with the scope of the project and in order to prepare a bid that will meet Canada's expectations, an extension of the bid submission date is requested. A 45-day extension is requested, which would be adequate in the perspective that the main suppliers respond within acceptable deadlines.

A1. In order to fit all the procurement activities before the winter break Canada agrees to extend the closing date to November 28, 2022.

Q2. The first two lines of the Cost Breakdown table in Annex B refer to the SOW section 7.1.6 while the description refers to the structure. Can this table be detailed, namely what is expected in connection with it?

A2. Section 7.1.6 makes no connection to the structure or associated table. On the other hand, Section 7.1.6 clearly states that before the Production Engineering Phase (1C) can proceed, the Contractor must complete the Design Development Completion Phase (1B) by completing the DED T-005 Technical Reference Base.

Q3. See below.

- a. The specification for the Fixed-Gas indicates it must be suitable for Class D fire. Please confirm the type of metal to be protected.
 1. Note: the lithium contained in Li-Ion batteries is not considered a Class D hazard and therefore does not need to be protected as if this is a Lithium fire.
- b. Are alternative solutions for Total flood systems acceptable, i.e., such as the extension of the water-mist system to other areas.
- c. The specification does not describe any Gas Detection requirements for the two battery compartments. Has this been considered as part of the requirements for battery storage rooms?
- d. What are the volumes of the protected spaces, please provide Gros and Net volumes for these spaces
- e. item 4789 for Fire Detection, the requirement indicates that the FDS must indicate the Fan shutdown status, if this is provided to the SCMS is it still a requirement of the FDS? The FDS by class rules does not have to display 3rd party system status when this is achieved via other integrated systems.
- f. Item 4795 for Fire Detection, the requirement indicates that the FDS must be connected to the VDR, class rules allow for this connection to be via the SCMS when the SCMS is integrated with the FDS. Is this an acceptable alternative arrangement?
- g. Item 4794 for fire detection, the requirement indicates the FDS must interface with the PA/GA, please confirm if this is to activate the PAGA or if this is for the PAGA system to silence the FDS outputs
 1. Further, class requirements allow for a potential free contact to be provided from the FDS to activate the PAGA when the PAGA provides all audible signals for fire alarm indication. Please confirm if the PAGA system will also be used to generate the fire alarm tone for the vessel. Where the PAGA is responsible for the fire alarm indication, separate audible circuits from the FDS are not required.
- h. Item 4790/4798 for fire detection, the requirement is to provide visual signals for high noise areas, please confirm if it is acceptable where the Signal Alarm Columns are fitted by the SCMS integrator that the alarms from this system satisfy this requirement OR is the requirement to still provide separate individual signals from the FDS.
- i. Item 4803, 4804, 4805, 4806 for fire detection, the requirement is to show the location of these devices. Is the intent of this spec item to simply have indication via text on the HMI or is the intent to have this shown as a graphic overlay of the Vessel showing the exact location of each device?
 1. Note, this can be achieved and is acceptable to class to be provided by the SCMS, is this an acceptable alternative where the SCMS has this capability. This is how the arrangement has been done on the OFSV and OOSV class vessels.

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- j. Item 4808 for fire detection, the requirement indicates that information must be provided for the fixed fire system releases. Is the intent to indicate that the fire detection system must have control for the release of the fire suppression systems or simply indication?
 - 1. Typically, class only accepts indication and release for fire systems such as local application water mist systems
- k. Please confirm the hazard rating of the Battery Compartments, are explosion proof and/or intrinsically safe devices required in the battery rooms.
- l. 6485 for Fixed gas fire suppress and 523 Water-Mist, is it acceptable to only use one single solution for this compartment? Water mist is acceptable as a method to extinguish Battery fires but this specification suggests multiple system types as a solution. Is the intent of this project to have the fixed gas automatic and the water-mist manual only?
- m. Please confirm the water capacity of the technical or potable freshwater tanks, what capacity is available for 30minute run time of the water-mist system.
- n. Item 523 for Water-Mist, is there a backup sea-water connection available and what is the working pressure of the fire main
- o. Item 523 for Water Mist, what is the available power for the water mist system?

A3. The technical design package defines the necessary characteristics of the systems, equipment and material to the extent necessary for the bidder to understand design and determine the work required to complete the design. Where the requirements for a system are not explicitly defined It is the Bidder's responsibility to perform this type of detailed systems development and integration and to meet the requirements of the technical specifications. The Statement of Work is structured to include the necessary design phases to review the design information provided and subsequently complete the design development.

ANNEX "F" – INSURANCE REQUIREMENTS

1. Ship Builders Risk Insurance

The Contractor shall enter into a contract of insurance issued in the joint names of the Contractor and Canada as their respective interests may appear in the standard form of Marine Builder's Risk Policy to provide full indemnification to Canada for any loss or damage to the vessel or any other materials which are the property of Canada for installation in the vessel in the custody of the Contractor or any claim or expenses to Canada as aforesaid for which the Contractor assumes responsibility hereunder, and the premium or cost of such insurance coverage shall be incorporated into and form part of the purchase price.

Notice of Cancellation: The insurer shall provide to the Contracting Authority at least thirty (30) days prior written notice of any policy cancellation or any adverse material changes in the policy coverage.

Settlement of Claims: Insurance proceeds from any loss or damage to government property must be payable to the appropriate party, as directed by the Contracting Authority.

2. Commercial General Liability Insurance

1. The Contractor must obtain Commercial General Liability Insurance, and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature, but for not less than \$10,000,000 per accident or occurrence and in the annual aggregate.
2. The Commercial General Liability Insurance policy must include the following:
 - a. Additional Insured: Canada is added as an additional insured, but only with respect to liability arising out of the Contractor's performance of the Contract. The interest of Canada should read as follows: Canada, as represented by Public Works and Government Services Canada.
 - b. Bodily Injury and Property Damage to third parties arising out of the operations of the Contractor.
 - c. Products and Completed Operations: Coverage for bodily injury or property damage arising out of goods or products manufactured, sold, handled, or distributed by the Contractor and/or arising out of operations that have been completed by the Contractor.
 - d. Personal Injury: While not limited to, the coverage must include Violation of Privacy, Libel and Slander, False Arrest, Detention or Imprisonment and Defamation of Character.
 - e. Cross Liability/Separation of Insureds: Without increasing the limit of liability, the policy must protect all insured parties to the full extent of coverage provided. Further, the policy must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.
 - f. Blanket Contractual Liability: The policy must, on a blanket basis or by specific reference to the Contract, extend to assumed liabilities with respect to contractual provisions.
 - g. Employees and, if applicable, Volunteers must be included as Additional Insured.
 - h. Employers' Liability (or confirmation that all employees are covered by Worker's Compensation (WSIB) or a similar program).

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- i. **Broad Form Property Damage including Completed Operations:** Expands the Property Damage coverage to include certain losses that would otherwise be excluded by the standard care, custody or control exclusion found in a standard policy.
- j. **Notice of Cancellation:** The Insurer will endeavour to provide the Contracting Authority with thirty (30) days written notice of policy cancellation.
- k. If the policy is written on a claims-made basis, coverage must be in place for a period of at least twelve (12) months after the completion or termination of the Contract.
- l. **Owners' or Contractors' Protective Liability:** Covers the damages that the Contractor becomes legally obligated to pay arising out of the operations of a subcontractor.
- m. **Non-Owned Automobile Liability - Coverage for suits against the Contractor** resulting from the use of hired or non-owned vehicles.
- n. **Sudden and Accidental Pollution Liability (minimum 120 hours):** To protect the Contractor for liabilities arising from damages caused by accidental pollution incidents.
- o. **Litigation Rights:** Pursuant to subsection 5(d) of the *Department of Justice Act*, S.C. 1993, c. J-2, s.1, if a suit is instituted for or against Canada which the Insurer would, but for this clause, have the right to pursue or defend on behalf of Canada as an Additional Named Insured under the insurance policy, the Insurer must promptly contact the Attorney General of Canada to agree on the legal strategies by sending a letter, by registered mail or by courier, with an acknowledgement of receipt.

For the province of Quebec, send to:

*Director Business Law Directorate,
Quebec Regional Office (Ottawa),
Department of Justice,*

*284 Wellington Street, Room SAT-6042,
Ottawa, Ontario, K1A 0H8*

For other provinces and territories, send to:

Senior General Counsel,

Civil Litigation Section,

Department of Justice

234 Wellington Street, East Tower

Ottawa, Ontario K1A 0H8

A copy of the letter must be sent to the Contracting Authority. Canada reserves the right to co-defend any action brought against Canada. All expenses incurred by Canada to co-defend such actions will be at Canada's expense. If Canada decides to co-defend any action brought against it, and Canada does not agree to a proposed settlement agreed to by the Contractor's insurer and the plaintiff(s) that would result in the settlement or dismissal of the action against Canada, then Canada will be responsible to the Contractor's insurer for any difference between the proposed settlement amount and the amount finally awarded or paid to the plaintiffs (inclusive of costs and interest) on behalf of Canada.

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3. Errors and Omissions Liability Insurance

1. The Contractor must obtain Errors and Omissions Liability (a.k.a. Professional Liability) insurance, and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature but for not less than \$1,000,000 per loss and in the annual aggregate, inclusive of defence costs.
2. If the policy is written on a claims-made basis, coverage must be in place for a period of at least 12 months after the completion or termination of the Contract.
3. The following endorsement must be included:

Notice of Cancellation: The Contractor will provide the Contracting Authority thirty (30) days prior written notice of policy cancellation or any changes to the insurance policy.

4. Marine Liability Insurance

1. The Contractor must obtain protection and indemnity insurance that must include excess collision liability and pollution liability. The insurance must be placed with a member of the International Group of Protection and Indemnity Associations or with a fixed market in an amount of not less than the limits determined by the Marine Liability Act, S.C. 2001, c. 6. Coverage must include crew liability, if it is not covered by Worker's Compensation as detailed in paragraph 2 below.
2. The Contractor must obtain worker's compensation insurance covering all employees engaged in the Work in accordance with the statutory requirements of the territory or province or state of nationality, domicile, employment, having jurisdiction over such employees. If the Contractor is subject to an additional contravention, as a result of an accident causing injury or death to an employee of the Contractor or subcontractor, or due to unsafe working conditions, then such levy or assessment must be paid by the Contractor at its sole cost.
3. The protection and indemnity insurance policy must include the following:
 - a. Full joint insured: Canada is added as full joint insured, but only with respect to liability arising out of the Contractor's performance of the Contract. The interest of Canada as full joint insured should read as follows: Canada, represented by Public Works and Government Services Canada
 - b. Notice of cancellation: The Contractor will provide the Contracting Authority a written notice of policy cancellation or any changes to the insurance policy as soon as the contractor becomes aware of any changes or cancellation.
 - c. Litigation rights: Pursuant to subsection 5(d) of the Department of Justice Act, R.S.C. 1985, c. J-2, s.1, if a suit is instituted for or against Canada which the Insurer would, but for this clause, have the right to pursue or defend on behalf of Canada as an Additional Named Insured under the insurance policy, the Insurer must promptly contact the Attorney General of Canada to agree on the legal strategies by sending a letter, by registered mail or by courier, with an acknowledgement of receipt.

For the province of Quebec, send to:

Director Business Law Directorate,
Quebec Regional Office (Ottawa),

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*Department of Justice,
284 Wellington Street, Room SAT-6042,
Ottawa, Ontario, K1A 0H8*

For other provinces and territories, send to:

*Senior General Counsel,
Civil Litigation Section,
Department of Justice
234 Wellington Street, East Tower
Ottawa, Ontario K1A 0H8*

A copy of the letter must be sent to the Contracting Authority. Canada reserves the right to co-defend any action brought against Canada. All expenses incurred by Canada to co-defend such actions will be at Canada's expense. If Canada decides to co-defend any action brought against it, and Canada does not agree to a proposed settlement agreed to by the Contractor's insurer and the plaintiff(s) that would result in the settlement or dismissal of the action against Canada, then Canada will be responsible to the Contractor's insurer for any difference between the proposed settlement amount and the amount finally awarded or paid to the plaintiffs (inclusive of costs and interest) on behalf of Canada.

ANNEX "G" – PROCEDURE FOR UNSCHEDULED WORK

1. Purpose

The Additional Work Procedure has been instituted for the following purposes:

- (a) To establish a uniform method of dealing with requests for Additional Work;
- (b) To obtain the necessary Technical Authority approval and Contracting Authority authorization before Additional work commences; and
- (c) To provide a means of maintaining a record of Additional Work requirements including Serial Numbers, dates, and accumulated cost.

2. Definitions

- (a) An Additional Work Procedure is a contractual procedure whereby changes to the scope of Work under the Contract may be defined, priced and contractually agreed to;
- (b) The procedure does not allow for the correction of deficiencies in the Contractor's Proposal.

3. Procedures

- (a) The procedure involves the form PWGSC-TPSGC 1686 for new construction. This form is to be used when the work has been fully defined, and the final cost has been agreed to and/or negotiated. It will be the form for authorizing all Additional Work to be followed by Contract Amendment.
- (b) Emergency measures required to prevent loss or damage to the Boat, which would occur if this procedure is followed, shall be taken by the Contractor on its own authority. The responsibility for the cost of such measures shall be determined in accordance with the terms and conditions of the contract.
- (c) The Technical Authority will initiate a work estimate request by defining the Additional Work requirement. It will attach drawings, sketches, additional Specification, other clarifying details as appropriate, and allocate their Serial Number for the request.
- (d) Notwithstanding the foregoing, the Contractor may propose to the Technical Authority in writing, either by letter or some type of Defect Advice Form (this is the Contractor's own form) that certain Additional Work should be carried out. The Technical Authority will either reject or accept such proposal, and advise the Contractor and Contracting Authority. Acceptance of the proposal is not to be construed as authorization for the work to proceed. If required, the Technical Authority will then define the Additional Work requirement in accordance with sub-paragraph 3(c).
- (e) After the Additional Work requirement is defined, the original and one (1) copy with all attachments, will be passed by the Technical Authority to the Contracting Authority.
- (f) The Contracting Authority will retain the original with attachments and submit a copy with attachments to the Contractor.
- (g) The Contractor will submit its Proposal (Paragraph 6 - Form Of Proposal and Supporting Documentation) to the Contracting Authority together with any qualifications, remarks or other information requested.

- (h) After discussion between the Contracting Authority and the Contractor and if no negotiation is required, the Contractor will then complete the appropriate PWGSC-TPSGC form including the agreed costs, allocate a Serial Number, sign the form and pass it to the Contracting Authority. If the Technical Authority wishes to proceed, the form will be signed then. The Contracting Authority will then sign and authorize the Additional Work to proceed.
- (i) In the event negotiation is required, the Contracting Authority will arrange for the negotiations. If negotiations are successful the Contractor will then complete the PWGSC-TPSGC form including the agreed costs, sign the form and pass it to the Contracting Authority. The Contracting Authority will then pass the form to the Technical Authority. If the Technical Authority wishes to proceed it will sign the form. The Contracting Authority will then sign and authorize the Additional Work to proceed.
- (j) In the event the Technical Authority does not wish to proceed with the work, it will cancel the proposed Additional Work through the Contracting Authority in writing.
- (k) In the event the negotiation involves a Credit, the appropriate PWGSC-TPSGC form will be noted as "credit" accordingly.
- (l) In the event that Additional Work of an urgent nature is required by the Technical Authority, or an impasse has occurred in negotiations, the commencement of the Additional work should not be unduly delayed and should be processed as follows, in either case.

The Contractor will complete the appropriate PWGSC-TPSGC form indicating the offered cost and pass it to the Contracting Authority. If the Technical Authority wishes to proceed, the Technical Authority and the Contracting Authority will sign the completed PWGSC-TPSGC form with the notation, "CEILING PRICE SUBJECT TO DOWNWARD ADJUSTMENT", and allocate a Serial Number having the suffix "A". The work will proceed with the understanding that following an audit of the Contractor's actual costs for completing the described work, the cost will be finalized at the ceiling price or lower, if justified by the audit. A new PWGSC-TPSGC form will then be completed with the finalized costs, signed and issued with the same Serial Number without the suffix "A", and bearing a notation that this form is replacing and canceling the form having the same Serial Number with the suffix "A".

PWGSC-TPSGC forms bearing Serial Numbers with a suffix "A" shall not to be included in any contract amendments, and therefore no payment shall be made until final resolution of the price and incorporation into the contract.

- (m) No work may be undertaken by the Contractor without written authorization of the Contracting Authority except under emergency circumstances described in sub-paragraph 3(b). Additional Work undertaken without written Contracting Authority authorization will be considered the Contractor's responsibility and cost.
- (n) The appropriate PWGSC-TPSGC form is the final summary of the definition of the Additional work requirement, and the costs negotiated and agreed to. The Contracting Authority will forward the original to the Contractor and distribute copies as required.

4. Amendment to Contract or Formal Agreement

The Contract will be amended from time to time in accordance with the Contract terms to incorporate the costs authorized on the appropriate PWGSC-TPSGC forms.

5. Form of Description of Additional Work

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The Statement of Work for the Additional Work will be limited to a statement of what has to be done. It will state how conformance will be measured or inspected.

6. Form of Proposal and Supporting Documentation

- (a) The Contractor will be afforded an opportunity, prior to submitting a Proposal, to discuss any technical questions regarding the statement of work for the Additional Work item. If necessary, a meeting will be held, prior to the submission of a Proposal, to review the statement of work in order to ensure that there is a clear understanding of the technical and other requirements, including the effect on schedules and supply of materials. Requests for such meetings will be made to the Contracting Authority who will also chair the meetings. Any additions or deletions to the statement of work agreed to at such meetings will be the subject of a formal amendment to the statement of work and processed by the Technical Authority through the Contracting Authority.
- (b) The Contractor's Proposal for each Additional work item shall be broken down as to person hours by trade and material cost per item. These breakdowns shall accompany each submission by the Contractor to the Contracting Authority prior to any required negotiations.
- (c) Prior to any required negotiation, the Contractor shall provide to the Contracting Authority, for its retention, the following:
 - (i) A work plan and/or any sketches and marked-up drawings as appropriate or requested; and
 - (ii) Copies of subcontractor and/or material suppliers' quotations (including the Contractor's requests for such quotations). In the event telephone quotations are used to finalize the negotiations, these quotations would be subject to later verification by Canada. The Contractor shall provide copies of purchase orders and paid invoices for subcontracts and/or materials, including stocked items, in either case.
- (d) Subcontracts and materials - The Contractor shall provide a minimum of two quotations for subcontracts or materials. If other than the lowest, or sole source is being recommended for quality and/or delivery considerations, this shall be noted. On request to the Contractor, the Contracting Authority shall be permitted, to meet with any proposed subcontractor or material supplier for discussion of the price. These requests will generally be limited to major sole source situations and always with the Contractor's representative present.
- (e) The selected Contractor shall have a cost accounting system that is capable of assigning job numbers for each Additional Work requirement so that each requirement can be audited individually. Prior to award of Additional Work, the selected Contractor shall provide written statements that a cost accounting system exists. The cost accounting system may be reviewed by the Contracting Authority prior to award of any Additional Work.

7. Supply Of Forms

On request, the Contracting Authority will supply the appropriate form PWGSC-TPSGC 1686. A copy can also be found at Annex "I" - Forms.

ANNEX "H" – WARRANTY

Warranty Procedure

E1. Scope

- a. The following are the procedures that suit the particular requirements for warranty considerations for a vessel on completion of the construction of a new vessel.

E2. Reporting Failures with Warranty Potential

- a. The initial purpose of a report of a failure is to facilitate the decision as to whether or not to involve warranty and to generate action to effect repairs. Therefore in addition to identification, location data, etc., the report must contain details of the defect. Warranty decisions as a general rule are to be made locally and the administrative process is to be in accordance with procedures as indicated.
- b. These procedures are necessary as invoking a warranty does not simply mean that the warrantor will automatically proceed with repairs at his expense. A review of the defect may well result in a disclaimer of responsibility, therefore, a review of the warrantor's assertion will be done by the Technical Authority (TA) with the involvement of the Inspection Authority, as deemed necessary by Canada.

E3. Procedures

- a. Immediately after it becomes known to the vessel's staff that an equipment or system is performing below accepted standards or has become defective, the procedures for the investigation and reporting are as follows:

- i. The vessel staff advises the Technical Authority when a defect, which is considered to be directly associated the refit work, has occurred.
- ii. Upon review of Annex "A" Statement of Work and the Acceptance Document, the Technical Authority in consort with the vessel's staff is to complete Section 1 and Section 2 of the Warranty Claim Form, found in Annex "I" - Forms and forward the original to the Contractor for review with a copy to the Contracting Authority. If the Contracting Authority or Technical Authority or Inspection Authority is unable to support warranty action, the Defect Claim Form will be returned to the originator with a brief justification. It is to be noted that in this instance, the Contracting Authority will inform the Contractor of its decision and no further action will be required of the Contractor.

Warranty defect claims may be forwarded in hard copy, by fax or by e-mail, whichever format is the most convenient.

- iii. Assuming the Contractor accepts full responsibility for repair, the Contractor is to complete Sections 3 of the Warranty Claim Form, and return it to the TA or IA (as in paragraph E2.b, above) who confirms corrective action has been completed, and who then distributes the form to the Contracting Authority.
- b. In the event that the Contractor disputes the claim as a warranty defect, or agrees to share the responsibility,

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the Contractor is to complete Sections 3 of the Warranty Claim Form with the appropriate information and forward it to the Contracting Authority who will distribute copies as necessary.

- c. When a warranty defect claim is disputed by the Contractor, the Technical Authority may arrange to correct the defect by in-house resources or by contracting the work out. All associated costs must be tracked and recorded as a possible charge against the Contractor by the Contracting Authority. Material costs and manhours expended in correcting the defect are to be recorded on a separate spreadsheet and attached to the claim form by the Technical Authority who will forward the warranty defect claim to the Contracting Authority for action. Defective parts of equipment are to be retained pending settlement of the claim.
- d. Defective equipment associated with potential warranty should not normally be dismantled until the Contractor's representative has had the opportunity to observe the defect. The necessary work is to be undertaken through normal repair methods and costs must be segregated as a possible charge against a Contractor by the Contracting Authority.

E4. Liability

- a. Agreement between Canada and the Contractor will result in one of the following conditions:
 - i. The Contractor accepts full responsibility for costs to repair or overhaul under the warranty provisions of the Contract;
 - ii. Canada accepts full responsibility for repair and overhaul of the item concerned; or
 - iii. The Contractor and Canada agree to share responsibility for the costs to repair or overhaul the unserviceable item, in such cases the PWGSC Contracting Authority will negotiate the best possible sharing arrangement.
- b. In the event of a disagreement as in PWGSC will take necessary action with the Contractor while the Technical Authority informs its Senior Management including pertinent data and recommendations.
- c. The total cost of processing warranty claims must include accommodation and travel costs of the Contractor's employees as well as equipment/system down time and operational constraints. Accordingly, the cost to remediate the defect, in manhours and material, will be discussed between the Contracting/Inspection Authorities and the Technical Authority to determine the best course of action.

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ANNEX "I" – FORMS

1. PWGSC 1686

Link: <https://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>

Public Works and Government Services Canada Travaux publics et Services gouvernementaux Canada		Clear Data - Effacer les données		File No. - N° du dossier
QUOTATION FOR DESIGN CHANGE OR ADDITIONAL WORK SOUMISSION POUR MODIFICATION DU PLAN OU TRAVAIL SUPPLÉMENTAIRE				Design Change No. N° de Modification du plan
Contractor - Entrepreneur				
Vessel - Navire		PWGSC Contract Serial No. - N° de Série du contrat du TPSGC		
You are requested to inspect the work specified and to furnish without delay a firm price quotation for carrying out this work. Vous êtes priés d'inspecter le travail spécifié et de soumettre sans délai un prix ferme pour son exécution.				
Description of Design Change or Additional Work - Description de la modification du plan ou du travail supplémentaire				
Detailed specification of work attached as Appendix * * - Le cahier des charges figure à l'appendice *				
Drawings Affected - Plans concernés	Titles - Titres	Drawing no. - N° de plan	Dated - En date du YYYY-MM-DD - AAAA-MM-JJ	
A	Description of Work - Description du travail	Increased/Decreased Person hours Augmentation/Réduction des heures-personnes	Contract Chargeout Rate per Hour Taux horaire tout compris imputable au contrat	Total
			Sub-Total Somme partiel	A \$0.00
B	Material Requirements - Matériaux requis	Net Cost Addition/Reduction Coût net Augmentation/Réduction	Profit per Contract Profit par contrat	Total
			Sub-Total Somme partiel	B \$0.00
DELIVERY - LIVRAISON YYYY-MM-DD - AAAA-MM-JJ If approved not later than _____ this work can be carried out during the scheduled period of construction. Nous pouvons accomplir ce travail au cours de la période prévue pour la construction, pourvu qu'il soit approuvé au plus tard le _____ This work will delay completion of the vessel by _____ days. Le présent travail retardera l'achèvement du navire de _____ jours. Prices quoted are valid for _____ days. Les prix indiqués restent en vigueur pendant _____ jours. Date YYYY-MM-DD AAAA-MM-JJ Position - Poste Signature		SUMMARY OF COST - RELEVÉ DES COÛTS Sub-total A and B Somme partielle A et B \$0.00 Applicable Taxes - Taxes applicables % \$0.00 Total Firm Price: Increase or Credit Prix ferme : augmentation ou crédit \$0.00		
Inspector's Certification Attestation de l'inspecteur Date YYYY-MM-DD AAAA-MM-JJ Position - Poste Signature		Date YYYY-MM-DD AAAA-MM-JJ Position - Poste Signature		
Technical Authority Certification Attestation de l'autorité technique Certified as being technically acceptable and in accordance with the above specified requirements. Certifié techniquement acceptable et conforme aux exigences précisées ci-dessus. Date YYYY-MM-DD AAAA-MM-JJ Position - Poste Signature		Contracting Authority to Take Work in Hand Autorité contractante pour entreprendre le travail You are hereby authorized to undertake the work as specified in accordance with the contractual terms for the sum of Vous êtes par les présentes autorisés à entreprendre le travail spécifié, conformément aux clauses contractuelles, pour la somme de \$ _____ Date YYYY-MM-DD AAAA-MM-JJ Position - Poste Signature		
NOTE: Attach additional sheets if necessary. REMARQUE: Annexer des feuilles supplémentaires, si nécessaire.				
PWGSC-TPSGC 1686 (05/2014)				

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2. Warranty Claim Form

1. Warranty Claim Information – Information de réclamation de garantie	
Vessel Number – Numéro de navire	Contract No. –No de Contrat
Client Department – Ministère du client	Warranty Claim Serial No. - Numéro de série de la demande de garantie
Contractor – Entrepreneur	<p>Effect on Vessel Operations -</p> <p>Effet sur les opérations de navire</p> <p>Critical/critique : Yes/Oui or No/Non</p> <p>Degraded/ Dégradé : Yes/Oui or No/Non</p> <p>Operational/ Opérationnel : Yes/Oui or No/Non</p> <p>Non-operational/ Non-opérationnel : Yes/Oui or No/Non</p>
2. Description of Warranty Claim – Description de la réclamation de garantie	
<p>a) Date of incidence : year/month/day – Date de l'incident: année/mois/jour</p> <p>b) Location of Vessel : City/Province or CCG base – Emplacement du navire: Ville/Province ou base de la GCC</p> <p>c) Priority: Normal or Urgent – Priorité: normal ou urgent</p> <p>d) System affected: Name of system (s) – Système concerné: nom du ou des systèmes</p> <p>e) Description of issue: Provide a brief description – Description du problème: Donnez une brève description</p> <p>f) Travel required: Yes or No – Voyage requis: oui ou non</p> <p>g) FSR required: Yes or No – FSR requis: oui ou non</p> <p>h) Responsibility: CCG or Shipyard – Responsabilité: GCC ou chantier naval</p> <p>i) Additional information: Brief description – Information additionnelle: Brève description</p>	

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Contracting Authority/ Agent contractuel

Date

3. Provisional Acceptance Form

File No./ N° de dossier

Contract Serial No./ N° de série du contrat

Name of Vessel:

CONTRACTOR'S CERTIFICATION

Hereby certifies it has constructed and completed the above Vessel in accordance with the approved Specifications and Amendments to same with exception of those items still outstanding as well as items listed in the Non-conformance Report(s) on the attached Appendices

_____. These outstanding items will be completed in accordance with the specifications and contractual requirements without delay. {Enter Name of Supplier} understands that by signing this Contractor's Certification, it retains care and custody of the ship until delivery and the acceptance document (Form 1105) is authorized by all parties. The Contractor also understands that the Contract shall apply without change to address any loss or damage to the Work or any part of the Work until it is delivered to Canada in accordance with the Contract, as well as to address any damages to any third party in connection with the Contract. The Contractor also understands that Canada, by signing this document, is providing provisional acceptance of the Vessel only to authorise {Enter Name of Supplier} to transfer the Vessel to {Destination}. There, among others, Sea Trials must be conducted successfully and items in the Non-conformance Report(s), attached as Appendices _____, must be addressed to Canada's satisfaction before Canada's final acceptance of the Vessel. Without restricting the generality of the foregoing, the Contractor hereby agrees to complete any items still outstanding as listed on the attached Non-conformance Report(s) on the attached Appendices _____.

Provisional acceptance does not transfer liability for, or title of the Vessel to Canada.

Signature

Title

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INSPECTION AUTHORITY'S CERTIFICATION

hereby certifies that the above Vessel has been constructed and is complete and properly fitted in all respects in accordance with the relevant Specifications and Amendments to same, subject to the outstanding work items and items identified in the Non-conformance Report(s) listed in the Appendices (attached). Provisional acceptance of the Vessel is therefore granted for the transfer of the vessel by the Contractor to Dartmouth, Nova Scotia, where among others, Sea Trials must be conducted successfully by the Contractor and items in the Non-conformance Report(s), attached as Appendices _____, must be addressed to Canada's satisfaction before Canada's final acceptance of the Vessel is to be given.

Signature

Title

Date

DEPARTMENT OF PUBLIC WORKS AND GOVERNMENT SERVICES CERTIFICATION

_____ hereby certifies that, to the best of his/her knowledge, the certifications provided by the Contactor and the Inspection Authority are consistent with the progress of the Work and are in accordance with the Contract and that, in reliance upon the Contractor's agreement to complete those exceptions listed as outstanding items as well as items in the Non-conformance Report(s) listed on the attached Appendices _____, the Vessel may be provisionally accepted by the Department of Fisheries and Oceans. And as a result, the Vessel can now be transferred by the Contractor to {Destination}, where among others, Sea Trials must be conducted successfully by the Contractor and items in the Non-conformance Report(s), attached as Appendices _____, must be addressed to Canada's satisfaction in the manner and time identified in clause 7.27 of the Contract before Canada's final acceptance of the Vessel.

Provisional acceptance does not transfer liability for, or title of the Vessel to Canada.

Signature

Title

Date

DEPARTMENT OF FISHERIES AND OCEANS PROVISIONAL ACCEPTANCE

_____ hereby acknowledges the certifications made by the Inspection Authority and the Contracting Authority. In accordance with the foregoing, the above Vessel is hereby provisionally accepted on behalf of the Minister of Fisheries and Oceans subject and pursuant to the terms and conditions of the Contract. This provisional acceptance of the Vessel is made without prejudice to the rights of Canada and the liabilities of the Contractor under the Contract and its certification above

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including that as a result of this provisional acceptance, the Vessel can now be transferred by the Contractor to {Destination}, where among others, Sea Trials must be conducted by the Contractor successfully and items listed as outstanding as well as items in the Non-conformance Report(s), attached as Appendices _____, must be addressed to Canada's satisfaction in the manner and time identified in clause 7.27 of the Contract before Canada's final acceptance of the Vessel.

I hereby provisionally accept the above Vessel from {Name of Supplier}.

Signature Title Date

Representatives present – Représentants présents


Representative	Company	Title	Date

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4. Acceptance Form 1105

 Public Works and Government Services Canada Marine Branch	Travaux publics et Services gouvernementaux Canada Direction de la Marine	Français	
		Clear - Effacer	
File no.		Contract serial no.	
Name of Vessel			
CONTRACTOR'S CERTIFICATION			
hereby certifies it has constructed and completed the above vessel in accordance with the approved Specifications and Amendments to same with exception of those items still outstanding and listed on the attached Appendices _____. These outstanding items will be completed in accordance with the specifications and contractual requirements without delay. This vessel is now handed over to the Department of Public Works and Government Services representatives at:			
Place		Time	Date
Signature		Title	
INSPECTION AUTHORITY'S CERTIFICATION			
hereby certifies that the above vessel has been constructed and is complete and properly fitted in all respects in accordance with the relevant Specifications and Amendments to same, subject to those exceptions listed on the Appendices (attached).			
Signature		Title	Date
DEPARTMENT OF PUBLIC WORKS AND GOVERNMENT SERVICES ACCEPTANCE			
The above vessel is hereby accepted subject and pursuant to the terms and conditions of Contract Serial No. _____, entered into on _____ by Her Majesty the Queen in right of Canada and represented by the Minister of Public Works and Government Services Canada. This delivery and acceptance of the vessel is made without prejudice to the rights of Her Majesty in right of Canada and the liabilities of the Contractor under this Contract.			
Without restricting the generality of the foregoing, the Contractor hereby agrees to complete any items still outstanding as listed on the attached Appendices.			
Signature		Title	Date
OWNER ACCEPTANCE			
In accordance with the foregoing and on behalf of the Minister of _____, I hereby accept delivery of the above vessel from the Department of Public Works and Government Services.			
Signature		Title	Date

PWGSC-TPSGC 1105 (05/2005)

ANNEX "J"

GENERAL INFORMATION ON INDIGENOUS PARTICIPATION COMPONENT

An Indigenous Participation Component (IPC) is an activity which produces long-term benefits for Indigenous business, and which results from a particular procurement. IPCs must be categorized as either direct or indirect.

Benefit Objectives

The Contractor must seek and secure Indigenous business involvement primarily through subcontracting opportunities. The business activities proposed in support of this objective must be in the form of quantifiable transactions.

The purchase of goods and services from Indigenous businesses not directly related to the CCG NSFRV build contract, will be considered as indirect IPC. This objective must be in the form of quantifiable transactions.

Direct IPCs are preferable to indirect IPCs.

Direct benefits result from any part of the Work pertaining to the CCGS NSFRV build contract. Direct IPCs must include, but are not be limited to:

- (a) subcontracting for goods, services and materials;
- (b) direct employment of Indigenous labour by the Contractor; and
- (c) Indigenous business involvement.

Direct benefits are preferable to indirect benefits, however in the context of IPC activities, "indirect" benefits may include contract opportunities not related to the CCGS NSFRV build contract. For an example of "indirect benefits" please refer to Section 2.6 b) point iv.

DEFINITIONS:

The following definitions apply to the IPC Requirement of the Contract:

(i) Direct Benefits:

Direct Benefits are transactions incurred by the Contractor during performance of the Work that include:

a. Indigenous Business Subcontracting:

Subcontracting a portion of the Work, or goods or services required by the Contractor to deliver the Work, to a qualified Indigenous Business.

b. Indigenous Employment:

Full-time, Part-time and Casual employment of Indigenous persons.

c. Indigenous Training and Skills Development:

Training opportunities and skills development for Indigenous persons, such as on-the job training, or in-house training.

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(ii) Indirect Benefits:

Indirect Benefits are relevant socio-economic measures, other than Direct Benefits, such as, but not limited to, specialized training, career development, scholarships, and community outreach programs to help local Indigenous communities meet their economic development needs.

(iii) IPC Transactions:

The total value of all transactions incurred by the Contractor on Direct and Indirect Benefits.

ANNEX "K"

INDIGENOUS PARTICIPATION COMPONENT CERTIFICATION FORMS

Part 1 – INDIGENOUS PARTICIPATION COMPONENT (IPC) CERTIFICATION

The Bidder agrees that no less than 1.0% of the Total Estimated Cost of the Contract must be subcontracted to Indigenous business(es). Refer to Example of acceptable Indigenous Participation Components under 2.6(b) and Annex "J" for definitions.

In respect of the Contract, no less than 1.0% of the Total Estimated Cost of the Contract must be performed by the Indigenous business, the Indigenous component(s) of a joint venture, an Indigenous subcontractor, or Indigenous individuals, and the Contractor must be able to demonstrate, at the time of audit, that it meets this requirement.

An Indigenous business can be a Band as defined by the Indian Act, or a sole proprietorship, a limited company, a cooperative, a partnership or a not-for-profit organization in which Indigenous persons have at least 51% ownership and control.

An Indigenous business could also consist of a joint venture made up of two or more Indigenous businesses, or an Indigenous business and a non-Indigenous business(es), provided that the Indigenous business(es) has at least 51% ownership and control of the joint venture.

The Bidder agrees that it will comply with the requirements above, and will meet all of its obligations under the Indigenous Participation Component and that this will be subject to audit by Canada.

If the Bidder fails to meet these requirements, the associated Milestone payments described at table 2 in Annex "B" – Basis of Payment, will not be released.

This Certification is executed and signed by duly authorized representatives of the Bidder.

DATE

NAME OF COMPANY

NAME AND TITLE OF PERSON SIGNING THE CERTIFICATION

SIGNATURE

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Part 2 - INDIGENOUS PARTICIPATION COMPONENT PLAN CERTIFICATION

The Bidder acknowledges and agrees that it will submit an Indigenous Participation Component Plan within 2 Months after Contract Award, if awarded a contract.

The Indigenous Participation Component Plan must be submitted as a self-contained document and must provide the information described in Annex "L" of the Contract.

The Bidder agrees that it will comply with the requirements above, and will meet all of its obligations under the Indigenous Participation Component Plan and that this will be subject to audit by Canada, if awarded a contract.

This Certification is executed and signed by duly authorized representatives of the Bidder.

DATE

NAME OF COMPANY

NAME AND TITLE OF PERSON SIGNING THE CERTIFICATION

SIGNATURE

ANNEX "L"

THE INDIGENOUS PARTICIPATION COMPONENT (IPC) PLAN

No later than 2 months after Contract award, an Indigenous Participation Component (IPC) Plan must be provided to both the Contracting Authority and the IPC Authority. The plan must include the following factors:

IPC Format

The IPC Plan must address the following four areas:

- (a) Executive Summary;
- (b) Small Business Plan;
- (c) IPCs Management Plan; and
- (d) Detailed Transaction Sheets

Executive Summary

The executive summary must contain an integrated overview of the Contractor's total IPCs commitment. It must clearly demonstrate how the Contractor's IPCs commitments address the IPCs objectives, and how the objectives will be achieved through the proposed commitments.

The Contractor must provide a tabular presentation of the IPC. The presentation must include a summary of Direct IPCs Transactions.

Small Business Plan

The IPC Plan must include, in narrative format:

- (a) Small Business Subcontracting Plan - The Contractor must identify Indigenous business subcontractors that will be participating in the Contract, and describe in as much detail as possible, the Work to be performed by that company, including the dollar value which will correspond to the totals as noted within the detailed transaction sheets.
- (b) Supplier Development Plan - The Contractor must submit an Indigenous business supplier development plan that will identify opportunities, encouragement and assistance that the Bidder will provide to promote Indigenous business in areas such as technology transfer, investment, marketing assistance or management assistance. The objective should be to enable these firms to become ongoing suppliers.

The Contractor must include completed copies of the forms located in Annex "M" for each Indigenous business referenced in the IPC Plan.

Compliance with the certifications provided to Canada is subject to verification by Canada at any time. The Contracting Authority has the right to ask for additional information to verify the compliance with any certifications.

IPCs Management Plan

The IPC Plan must describe the methods by which the Contractor will implement, manage, monitor and report progress on its IPC activities, leading to the achievement of the proposed IPC commitments.

The Contractor must provide Indigenous Participation Component Reports describing the goals achieved as set forth in its IPC when it seeks milestone payments for the Indigenous Participation Component.

Detailed Transaction Sheets

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The IPC Plan must include examples of the Detailed Transaction Sheets that will be used to report the progress of the Contractor on its IPC activities in the Indigenous Participation Component Reports. Suggested formats are provided in Annex "N" Indigenous Participation Component Reports.

ANNEX "M"

INDIGENOUS CERTIFICATION REQUIREMENTS

FORM 1

CERTIFICATION REQUIREMENTS FOR INDIGENOUS BUSINESS

NOTE TO CONTRACTOR: The following certification requirements apply to this contract. The Contractor is REQUESTED to have these certifications completed by the Indigenous Participant by having them complete the appropriate spaces below and the Contractor is to provide the certifications to the Contracting Authority.

1. i) I, _____ (**Name of duly authorized representative or owner of the business**) hereby certify that _____ (**Name of business**) meets, and will continue to meet throughout the duration of the contract, the requirements for this program as set out in the attached document entitled "Requirements for the Set-Aside Program for Indigenous Business", which can be found under Appendix B of the following website: http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/contpolnotices/cpn_96-6-eng.asp, which document I have read and understand.

- ii) The aforementioned business agrees to ensure that any subcontractor it engages with respect to the contract will, if required, satisfy the requirements set out in "Requirements for the Set-Aside Program for Indigenous Business"
- iii) The aforementioned business agrees to provide to Canada, information to substantiate a subcontractor's compliance with this program.

PLEASE CHECK THE APPLICABLE BOXES IN 2 AND 3 BELOW

2. i) The aforementioned business is an Indigenous business which is a sole proprietorship, band, limited company, cooperative, partnership or not-for-profit organization, []

OR

ii) The aforementioned business is a joint venture between two or more Indigenous businesses or an Indigenous business and a non-Indigenous business. []

3. The Indigenous business or businesses have:

- i) fewer than six full-time employees []

OR

- ii) six or more full-time employees []

4. The aforementioned business agrees to immediately furnish to Canada, such evidence as may be requested by Canada from time to time, corroborating this certification. Such evidence must be open to audit during normal business hours by a representative of Canada, who may make copies and take extracts from the evidence. The aforementioned business agrees to provide all facilities for audits and to furnish information requested by Canada with respect to the certification.

5. It is understood that the civil consequences of making an untrue statement, or of not complying with the requirements of the Program or failing to produce satisfactory evidence to Canada regarding the requirements of the Program, may include: disqualification of the business from participating in future contracts under the Program; and/or termination of the contract. In the event that the contract is terminated because of an untrue statement or non-compliance with the requirements of the Program, Canada may engage another contractor to complete the performance of the contract and any additional costs incurred by Canada shall, upon the request of Canada be borne by the aforementioned business.

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6. Date: _____ Signature: _____

(Duly authorized representative of business)

Place: _____ Title: _____

For:

Name of Business

FORM 2

INDIGENOUS OWNER/~~INDIGENOUS~~ EMPLOYEE OR INDIGENOUS SUBCONTRACTOR CERTIFICATION

1. I, _____, am an
(Name)

owner and/or full-time employee or subcontractor of _____ ,
(Name of business)

and an Indigenous person, as described in Annex "K" Part 1 entitled " Indigenous Participation
CERTIFICATION REQUIREMENTS FOR INDIGENOUS BUSINESS".

2. I certify that the above statement is true and consent to its verification upon the request of Canada.

(Date)

(Place)

(Signature of owner and/or employee)

ANNEX "N"

INDIGENOUS PARTICIPATION COMPONENT REPORTS

When seeking the Indigenous Participation Components Milestones, as described in Annex "B" at table 2, the Contractor must deliver the following to the Indigenous Participation Component's (IPC) Authority, the Contracting Authority, and the Technical Authority for review:

i) An IPC Report, with supporting calculations, that detail the following for that milestone:

- a) A breakdown of the IPC Transactions and their total value; and,
- b) A detailed breakdown of the Direct Benefits and Indirect Benefits incurred as described in the table below.

ii) Supporting documentation certifying that the Indigenous firms stated in the IPC Report meet the definition of an Indigenous Business, and that Indigenous employees stated in the IPC Report meet the definition of Indigenous Persons as defined in the respective forms in Annex M.

iii) Invoices, pay stubs, receipts, and/or any other documentation that provides evidence that the Transactions claimed in the IPC Report were made in the amount claimed.

Detailed Transaction Sheets

The Detailed Transaction Sheet must be used to show each Direct IPC transaction completed. Other transactions that do not fit into the Direct IPC category must also be shown. In the context of IPC activities, "indirect" IPC Transactions are contractual business activities that are not associated with the CCGS NSFRV build contract, but contribute significantly to the goals and objectives of the IPC.

Transaction Number Contract	Company Name and Location of Work	Description of Work	Canadian Person Years	Value \$ CDN
Would be transaction # such as contract #	Name of Company or Individual	Detail of what the work is: Operator, Supplier, etc.	Number of People hired as	Value + taxes achieved
Totals				

ANNEX "O"

DELIVERABLES/CERTIFICATIONS

O1 Deliverables Checklist

Deliverables that must be submitted with the Bidder's bid to be evaluated as responsive are summarized below. The checklist is a tool intended to assist the Bidder to assemble its bid.

The following are mandatory requirements of the solicitation and the Bidder's bid will be evaluated against the requirements as defined herein. The Bidder must meet each of these requirements to be considered responsive.

Note that the content in the solicitation and its other Annexes will supersede this list if any omissions or inconsistencies are present.

Item	Description	Completed and Included
1	Request for Proposal document part 1 page 1 completed and signed (include in Section III)	
2	Completed Annex "B" Basis of Payment, Price Table 1	
3	Complete Annex R - Economic Price Adjustment and Exchange Rate Adjustment	
4	Completed Annex "P" Mandatory Technical Evaluation Criteria and Technical Point Rated Evaluation Criteria (include in Section I, as well as identified supporting evidence for compliance)	
5	Completed Annex "Q" No Substitute List	
6	Changes to Applicable Laws as per clause 2.4. If any, indicate the substitute name of a Canadian province or territory in Section III of the Bid submission	
7	Integrity Provisions –section 5.1.1, if applicable, and section 5.2.1 (include in Section III)	
8	Federal Contractors Program for Employment Equity, Complete section 5.2.2 (include in Section III)	
9	Completed IPC Certification forms provided at Annex "K" – IPC Certification Forms Part 1 and Part 2 as per Section 5.2 (include in Section III)	
10	Proof of good standing with Worker's Compensation Board, as per clause 6.3 (include in Section III) as well as 5.2.3	
11	Proof of valid Labor Agreement or similar instrument covering the work period, as per clause 6.4 (include in Section III) as well as in 5.2.5	
12	Valid ISO 9001-2015 Certification, as per clause 6.6 (include in Section III)	
13	Objective evidence of documented Health and Safety System, as per clause 6.7 (include in Section III)	
14	Objective evidence of documented Fire Protection, Fire Fighting and Training Procedure, as per clause 6.15 (include in Section III)	
15	Insurance Requirements, as per clause 6.8 (include in Section III);	
16	Details of Environmental Emergency Response Plan, Details of Formal Environmental Training as per Clause 6.16 (include in Section III)	
17	Deliverable/Certification List in Annex "O"	
18	Financial Evaluation Criteria – Price Table 1 in Annex B	

19	Welding Certification as per clause 6.9 (CWB to CSA Standard W47.1) as well as 5.2.4	
20	List of proposed subcontractors as per clause 6.10 (ref: Annex D)	
21	Provide a Quality Control Plan as per clause 6.11	
22	Provide a Inspection and Test Plan (ITP) as per clause 6.12	
23	Cost Breakdown as per Annex B, Section 6	
24	Milestone Payment Schedule as per Annex B – Table 2	

O2 Deliverables Checklist after Contract Award

Item	Description	Reference	Due By
1	Project Management Plan	DID M-001	30 days after contract award
2	Insurance requirements as per Annex "F"	Clause 7.12 and Annex "F"	10 days after contract award
4	Integrated Master Schedule	DID M-002	30 days after contract award
5	Risks and Issue Management Plan including the Risks and Issues Register	DID M-003	30 days after contract award
6	Cost Estimate	DID M-004	30 days after contract award
7	Technical Data Management Plan and Technical Data Register	DID M-005	30 days after contract award
8	Configuration and Change Management Plan	DID M-006	30 days after contract award
9	Progress Reporting	DID M-011	30 days after contract award
10	Quality Plan	DID Q-001	30 days after contract award
11	Master Equipment List	DID I-005	30 days after contract award
12	Asset Breakdown Structure	DID I-006	30 days after contract award
13	Recommended Spare Parts and Materiel List	DID I-007	90 days after contract award
14	Packaging, Handling, Storage and Transportability Requirements List	DID I-008	90 days after contract award
15	Initial Maintenance Task List	DID I-009	90 days after contract award
16	Maintenance Task Analysis	DID I-010	90 days after contract award
17	Maintenance Plan	DID I-011	180 days after contract award
18	Special Tools and Test Equipment	DID I-013	180 days after contract award
19	Training Recommendations and Analysis	DID I-014	90 days after contract award
20	Training Materials and Course Delivery	DID I-015	180 days after contract award
21	Obsolescence Notices	DID I-016	180 days after contract award
22	Disposal Plan	DID I-017	180 days after contract award

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23	As-Fitted Drawing Package	DID I-019	365 days after contract award
24	Equipment Certification Register	DID I-020	90 days after contract award
25	Inventory of Hazardous Materials	DID I-022	365 days after contract award
26	Life-Cycle Costing Analysis	DID I-023	90 days after contract award
27	Mast Structure and Analysis	DID T-171	180 days after contract award

ANNEX P

Mandatory Technical Evaluation Criteria and Technical Point Rated Evaluation Criteria

In their technical bid, Bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings (indicate a Bid Cross Reference page/section in the submission). To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

Mandatory Technical Evaluation Criteria

No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM1	The Bidder provides proof it has the physical space to build and launch a vessel with an overall length of at least 32 meters or greater, beam of at least 10.5 meters, lightship draft of at least 3.4 meters, overall height* of at least 18.750 meters and a lightship displacement of at least 500 metric tons as per the SOW Annex A. Requirement can be met by providing examples of vessel(s), building drawing structure, certification documents, etc.			
	* NOTE: Overall height refers to the distance between the bottom of the skag to the top of the mast structure			
	Fail	Pass		
	The Bidder does not provide proof it has the physical space to build a vessel with an overall length of at least 32 meters or greater, beam of at least 10.5 meters, draft of at least 3.4 meters, and a displacement of at least 500 metric tons as per the SOW Annex A	The Bidder provides proof it has the physical space to build a vessel with an overall length of at least 32 meters or greater, beam of at least 10.5 meters, draft of at least 3.4 meters, and a displacement of at least 500 metric tons as per the SOW Annex A		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM2	The Bidder provides proof it has the proven capability in the construction and launch of at least one (1) vessel with a length of at least 24 meters that is capable of moving and steering under its own power while providing accommodation for its crew in the past ten (10) years			
	Fail	Pass		

	The Bidder does not provide proof it has the proven capability in the construction and launch of at least one (1) vessel with a length of at least 24 meters that is capable of moving and steering under its own power while providing accommodation for its crew in the past ten (10) years	The Bidder <u>provides</u> proof it has the proven capability in the construction and launch of at least one (1) vessel with a length of at least 24 meters that is capable of moving and steering under its own power while providing accommodation for its crew in the past ten (10) years		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM3	The Bidder provides proof it has a signed agreement with AKA as the Single System Integrator for the Propulsion System			
	Fail	Pass		
	The Bidder does not provide proof it has a signed agreement with AKA as the Single System Integrator for the Propulsion System	The Bidder provides proof it has a signed agreement with AKA as the Single System Integrator for the Propulsion System		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM4	The Bidder provides proof it has a signed agreement with Hawboldt as the Single System Integration for Deck Equipment			
	Fail	Pass		
	The Bidder does not provide proof it has a signed agreement with Hawboldt as the Single System Integration for Deck Equipment	The Bidder provides proof it has a signed agreement with Hawboldt as the Single System Integration for Deck Equipment		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM5	The Bidder identifies the proposed classification society			
	Fail	Pass		
	The Bidder does not identify the proposed classification society	The Bidder identifies the proposed classification society		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM6	The Bidder provides a schedule as per DID M-002 Integrated Master Schedule			
	Fail	Pass		

	The Bidder does not provide a schedule as per DID M-002 Integrated Master Schedule	The Bidder provides a schedule as per DID M-002 Integrated Master Schedule		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM7	The Bidder provides a Project Management Plan as per DID M-001 Project Management Plan			
	Fail	Pass		
	The Bidder does not provide a Project Management Plan as per DID M-001 Project Management Plan	The Bidder provides a Project Management Plan as per DID M-001 Project Management Plan		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM8	The Bidder has an HVAC SSI or sub-contractor identified in their bid and a corporate resume is provided			
	Fail	Pass		
	The Bidder does not have an HVAC SSI or sub-contractor identified in their bid and a corporate resume not is provided	Bidder has an HVAC SSI or sub-contractor identified in their bid and a corporate resume is provided		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM9	The Bidder has a bridge SSI or sub-contractor identified in their bid and a corporate resume is provided			
	Fail	Pass		
	The Bidder does not have an bridge SSI or sub-contractor identified in their bid and a corporate resume not is provided	The Bidder has an bridge SSI or sub-contractor identified in their bid and a corporate resume is provided		
No	Mandatory Technical Evaluation Criteria		Bid Cross Ref.	Pass/Fail
TM10	The Bidder provides evidence that it meets the Indigenous Participation Component (IPC) with a minimum of one (1) percent of the overall contract value. Requirement to be met with proof of invoices, employment, contractor / sub-contractors, training and skills development etc.			
	Fail	Pass		

	The Bidder does not provide evidence that it meets the Indigenous Participation Component (IPC) with a minimum of one (1) percent of overall contract value	The Bidder provides evidence that it meets the Indigenous Participation Component (IPC) with a minimum of one (1) percent of overall contract value		
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Technical Point Rated Evaluation Criteria

Bids meeting ALL Mandatory Evaluation Criteria will be evaluated against the Technical Point Rated Evaluation Criteria.

For the Technical Point Rated Evaluation Criteria the overall maximum technical points achievable is 305 points. To be considered compliant with the Technical Point Rated Evaluation Criteria, the bidder must achieve the minimum overall points of 180. Bids that do not meet the minimum overall points will be considered non-compliant and given no further consideration.

NOTE: Type of documents or references that can be used to meet the requirements of the point-rated technical criteria: bill of sales, drawings, envelop maintenance, certification, pictures, etc.

No	Point Rated Evaluation Criteria	Maximum Points Available			
PR1	The Bidder provides proof it has the proven capability in the construction of vessels of similar complexity as the NSFRV in the past ten (10) years). The requirements can be met with a bill of sales, drawings, envelop maintenance, certification, pictures of equipment on top of equipment or otherwise. NOTE: “similar complexity” can be described as a vessel that meets A) ,B) ,C) ,D) and E)	/120			
	A) densely packed in terms of equipment. Densely packed is defined as a vessel that has the majority of the compartments contain a significant amount of machinery or specialised equipment for the size of vessel (e.g. scientific sonars and transducers, fishing equipment, deck equipment, azimuthing thrusters, etc.)				
	B) has a requirement related to reduced noise signature				
	C) includes an aluminum deckhouse and/or superstructure with steel hull				
	D) incorporates azimuthing propulsion				
	E) has an ice strengthened hull				
	Points Rating				
0	10	25	50	80	120

The Bidder does not show it has the experience in building one (1) vessel of 24 meters or greater in the past ten (10) years that <u>meets none</u> of the five (5) requirements described in “ similar complexity ” above	The Bidder shows it has the experience in building one (1) vessel of 24 meters or greater in the past ten (10) years that <u>meets at least one (1)</u> of the five (5) requirements described in “ similar complexity ” above	The Bidder shows it has the experience in building one (1) vessel of 24 meters or greater in the past ten (10) years that <u>meets at least two (2)</u> of the five (5) requirements described in “ similar complexity ” above	The Bidder shows it has the experience in building one (1) vessel of 24 meters or greater in the past ten (10) years that <u>meets at least three (3)</u> of the five (5) requirements described in “ similar complexity ” above	The Bidder shows it has the experience in building one (1) vessel of 24 meters or greater in the past ten (10) years that <u>meets at least four (4)</u> of the five (5) requirements described in “ similar complexity ” above	The Bidder shows it has the experience in building one (1) vessel of 24 meters or greater in the past ten (10) years that <u>meets at least five (5)</u> of the five (5) requirements described in “ similar complexity ” above
No	Point Rated Evaluation Criteria				Maximum Points Available
PR2	The Bidder has previous experience with design or build and integration of hybrid propulsion system (hybrid system implies a battery-diesel power generation system)				/15
Points Rating					
0	5	10	15		
The Bidder <u>does not have</u> experience with hybrid or diesel electric vessels	The Bidder has experience with <u>refit</u> of a hybrid vessel in the past five (5) years	The Bidder has experience with the <u>new construction (in progress)</u> of a hybrid or diesel-electric vessel in the past five (5) years	The Bidder has experience with the <u>new construction and delivery</u> of a hybrid or diesel-electric vessel in the past five (5) years		
No	Point Rated Evaluation Criteria				Maximum Points Available
PR3	The Bidder has experience managing sub-contractors / Single System Integrators (SSI) in a vessel from design to final production. Demonstrate how it is achieved.				/15
Points Rating					
0	5	10	15		

The Bidder has experience <u>managing one (1) SSI</u> on a single project within the last ten (10) years	The Bidder has experience <u>managing two (2) SSIs</u> on a single project within the last ten (10) years	The Bidder has experience <u>managing three (3) SSIs</u> on a single project within the last ten (10) years	The Bidder has experience <u>managing four (4) or more SSIs</u> on a single project within the last ten (10) years
No	Point Rated Evaluation Criteria		Maximum Points Available
PR4	The Bidder provides evidence that it meets the Indigenous Participation Component (IPC) in the ranges of one point one (1.1) percent to five (5) percent of overall contract value. Requirement to be met with proof of invoices, employment, contractor / sub-contractors, training and skills development etc.		/25
Points Rating			
10	15	20	25
The Bidder provides evidence that it meets the Indigenous Participation Component (IPC) in the ranges of <u>one point one (1.1) percent to two (2) percent</u> of overall contract value	The Bidder provides evidence that it meets the Indigenous Participation Component (IPC) in the ranges of <u>two point one (2.1) percent to three (3) percent</u> of overall contract value	The Bidder provides evidence that it meets the Indigenous Participation Component (IPC) in the ranges of <u>three point one (3.1) percent to four (4) percent</u> of overall contract value	The Bidder provides evidence that it meets the Indigenous Participation Component (IPC) in the ranges of <u>four point one (4.1) percent to five (5) percent</u> of overall contract value
No	Point Rated Evaluation Criteria		Maximum Points Available
PR5	The Bidder has to demonstrate that the bridge/electronic SSI that it has proven experience in the integration of bridge electronic equipment and fishing electronic equipment for new constructed vessel or refit of the scale of the NSFRV with an overall length of at least 24 meters where it has worked with a Bidder		/15
Points Rating			
0	5	10	15

The bridge / electronic SSI experience <u>does not have</u> any experience in the integration of bridge and fishing electronic equipment in a vessel of at least 24 meters in a shipyard.	The bridge / electronic SSI experience has experience in the integration of the bridge electronic equipment or fishing electronic equipment on <u>one (1) vessel</u> of at least 24 meters in a shipyard in the detail design, production engineering, installation and commissioning in the last ten (10) years.	The bridge / electronic SSI experience has experience in the integration of the bridge electronic equipment and fishing electronic equipment on <u>two (2) vessels</u> of at least 24 meters in a shipyard in the detail design, production engineering, installation and commissioning in the last ten (10) years.	The bridge / electronic SSI experience has experience in the integration of the bridge electronic equipment and fishing electronic equipment on <u>three (3) vessels</u> or more of at least 24 meters in a shipyard in the detail design, production engineering, installation and commissioning in the last ten (10) years.	
No	Point Rated Evaluation Criteria			Maximum Points Available
PR6	The Bidder has to demonstrate that HVAC SSI that it has proven experience in the integration of ventilation and air handling equipment for new constructed vessel or refit of the scale of the NSFRV with an with an overall length of between 24 meters and 43 meters.			/15
Points Rating				
0	5	10	15	
The HVAC SSI experience <u>has no proven</u> experience in the integration of ventilation and air handling equipment for new constructed vessel or refit of the scale of the NSFRV with an overall length of between 24 meters and 43 meters.	The HVAC SSI experience has proven experience in the integration of ventilation and air handling equipment for a <u>refit of one (1) vessel</u> of the scale of the NSFRV with an overall length of between 24 meters and 43 meters in a shipyard in the design, installation and commissioning of such equipment in the last ten (10) years.	The HVAC SSI experience has proven experience in the integration of ventilation and air handling equipment for the <u>construction of one (1) new vessel</u> of the scale of the NSFRV with an overall length of between 24 meters and 43 meters in a shipyard in the design, installation and commissioning of such equipment in the last ten (10) years.	The HVAC SSI experience has proven experience in the integration of ventilation and air handling equipment for the <u>construction of two (2) new vessels or refit</u> of the scale of the NSFRV with an overall length of between 24 meters and 43 meters. in a shipyard in the design, installation and commissioning of such equipment in the last ten (10) years.	

No	Point Rated Evaluation Criteria		Maximum Points Available
PR7	The Bidder has experience building a vessel with a reduced noise signature with the support of a professional noise control engineering firm		/10
Points Rating			
0	5	10	
The Bidder has <u>no experience</u> on building a vessel where noise signature was a consideration within the last ten (10) years	The Bidder <u>has experience</u> with the support of a professional noise control engineering firm building one (1) vessel where acoustic signature was a concern but there was <u>no specific standard</u> used to guide the process within the last ten (10)years	The Bidder <u>has experience</u> with the support of a professional noise control engineering firm building at least one (1) vessel where there were considerations for reducing the acoustic signature and a <u>specific standard</u> was to be met within the last ten (10) years	
No	Point Rated Evaluation Criteria		Maximum Points Available
PR8	The Bidder has experience with hybrid elements in a vessel build. (hybrid system implies a battery-diesel power generation system)		/30
Points Rating			
0	10	20	30
The Bidder has <u>no experience</u> on building a hybrid vessels	The Bidder has experience building at least one vessel in the last five (5) years having <u>1 of 3</u> : ESS*, diesel-electric power generation, batteries	The Bidder has experience building at least one vessel in the last five (5) years having <u>2 of 3</u> : ESS*, diesel-electric power generation, batteries	The Bidder has experience building at least one vessel in the last five(5) years having <u>3 of 3</u> : ESS*, diesel-electric power generation, batteries
*ESS – Energy Storage System			
No	Point Rated Evaluation Criteria		Maximum Points Available
PR9	The Bidder demonstrates its capability in Project Management for a project of similar size and complexity to that of the NSFRV. Level of complexity described in PR1 NOTE above		/20
Points Rating			

0	10	20	
The Bidder <u>does not provide a</u> Project Management Plan (PMP) or does not meet any of the criteria as per DID M-001	The Bidder provides a Project Management Plan (PMP) from <u>two (2) previous</u> projects and meets some but not all of the criteria as per DID M-001	The Bidder provides a Project Management Plan (PMP) from <u>three (3) previous</u> projects and meets all criteria as per DID M-001	
No	Point Rated Evaluation Criteria		Maximum Points Available
PR10	The Bidder provides the resume for a Project Manager with experience in a shipyard in managing engineering through construction and delivery of vessels of 24 meters or greater with a level of complexity similar to that of the NSFRV in the past ten (10) years. Level of complexity described in PR1 NOTE above		/20
Points Rating			
0	10	20	
The Project Manager has <u>less than ten (10) years'</u> experience working in a shipyard.	The Project Manager has experience in a shipyard in managing engineering through <u>construction and delivery of one (1) vessel</u> of 24 meters or greater with a level of complexity similar to that of the NSFRV in the past ten (10) years.	The Project Manager has experience in a shipyard in managing engineering through <u>construction and delivery of at least two (2) vessels</u> of 24 meters or greater with a level of complexity similar to that of the NSFRV in the past ten (10) years.	
No	Point Rated Evaluation Criteria		Maximum Points Available
PR11	The Bidder provides a schedule that indicates a timeframe of design between 8 – 12 months and a timeframe of build between 18 -24 months		/20
Points Rating			
0	10	20	
The Bidder <u>has no schedule</u> , or provides a schedule that <u>does not meet</u> the timeframe and does not include all the milestones	The Bidder has a schedule that <u>meets the timeframes</u> and shows <u>some but not all</u> milestones in the schedule	The Bidder has a schedule that <u>meets the timeframes and shows all milestones</u> in the schedule	

Solicitation No. - N° de l'invitation
F7013-220306/A
Client Ref. No. - N° de réf. du client
F7013-220306/A

Amd. No. - N° de la modif.
File No. - N° du dossier
040mc.F7013-220306/A

Buyer ID - Id de l'acheteur
040mc
CCC No./N° CCC - FMS No./N° VME

Total Score *minimum pass mark is 180	/305
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ANNEX “Q”

NO-SUBSTITUTE LIST

Equipment	Reference in SOW
Propulsion	
Diesel Electric Generators	Section 9.1
Propulsion Motors	Section 9.1
Propulsion Drives	Section 9.1
Switchboards (AC and DC as proposed)	Section 9.1
ESS	Section 9.1
Conversion equipment for ESS (chargers, inverters, converters and transformers)	Section 9.1
Power management and distribution software system	Section 9.1
Azimuthing thrusters	Section 9.1
Deck Equipment	
One (1) A stern A-Frame	Section 9.1
Two (2) Trawl Winches	Section 9.1
One (1) Crane	Section 9.1
One (1) CTD Winch	Section 9.1
One (1) Side J-frame	Section 9.1
One (1) Mooring Reel	Section 9.1
Two (2) removable Trawl Blocks	Section 9.1
One (1) Pot Hauler	Section 9.1
One (1) removable Davit for use with the Pot Hauler	Section 9.1
Sheaves (metering and not metering) to route the winches' cables to the packages to be deployed.	Section 9.1
Control Equipment:	
One (1) Control Chair	Section 9.1
One (1) HPU control and monitoring console	Section 9.1
One (1) HMI 19" display	Section 9.1
Deck equipment electric local controls.	Section 9.1
Powering:	
Associated electric deck equipment VFDs, or drives, with power regeneration	Section 9.1
Hydraulic system and components	Section 9.1

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040mc.F7013-220306/A

Buyer ID - Id de l'acheteur
040mc
CCC No./N° CCC - FMS No./N° VME

ANNEX "R"

Economic Price Adjustment and Exchange Rate Adjustment

Electronic to be completed separately



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Canadian
Coast Guard

Garde côtière
canadienne

ANNEX A

Statement of Work (SOW) Near-Shore Fishery Research Vessel (NSFRV) Build



Safety First, Service Always

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1. Introduction

- 1.1 The Department of Fisheries and Oceans (DFO) and the Canadian Coast Guard (CCG) have a requirement for one (1) new Near-Shore Fishery Research Vessel (NSFRV). The primary function of the NSFRV is oceanographic science. Secondary missions require capabilities consistent with search and rescue and environmental response.
- 1.2 The contract design package developed by Robert Allan Ltd. (RAL) as an output of the NSFRV Design Contract is a key input into this Contract.

2. Objective

- 2.1 The objective of the Work specified is to carry out the shipbuilding effort to construct and equip one (1) NSFRV and deliver the associated deliverables defined in the Contract.

3. Scope

- 3.1 The Contractor must complete the design engineering for the new NSFRV and then construct and deliver one (1) NSFRV to Canada.
- 3.2 The Contract will be delivered in two phases: Phase 1 – Design Completion, and Phase 2 – Build. Phase 1 must be completed prior to commencing Phase 2.
- 3.3 The Contractor must also deliver all the Integrated Logistics Support (ILS) documentation and training to support the entry into service of the Vessel.
- 3.4 The Contractor must conduct all the acceptance activities necessary to demonstrate compliance with the technical requirements as defined in the final production design package. Omission by Canada to list a document, regulation, standard or certificate does not relieve the Contractor of responsibility for compliance with any applicable rule, regulation or certificate for a vessel operating in Canadian waters on the delivery of the NSFRV.
- 3.5 The technical design package delivered by Canada shall be called the Contract Design package.
- 3.6 The SOW consists of this document and the following appendices:
 - a) Appendix A-1 Contract Data Requirements List (CDRL)
 - b) Appendix A-2 Data Item Descriptions (DIDs)
- 3.7 The CDRL and DIDs for the Work are attached at Appendices A-1 and A-2 respectively. DIDs define the individual Deliverables that the Contractor must provide to Canada at the times specified in the CDRL in accordance with this Contract. DIDs include: the format, process, delivery schedule and level of detail required to satisfy the requirements of each individual deliverable.
- 3.8 The Contractor must carry out and document all the Work using the International Standards units of measurements (commonly known as the Metric System) with the exception of material, equipment and machinery where the Imperial system of measurement is standard for the manufacturer.
- 3.9 The Contractor must integrate into the Vessel all materials, machinery, equipment and components identified in the NSFRV Design Contract specification.

4. Report and Drawing Formats

- 4.1 The Contractor must prepare and submit to Canada the as-fitted drawings, calculations and associated lists in accordance with DID **I-019 As-Fitted Drawing Package**. The Contractor must maintain and control the configuration of the drawings to reflect the Work under this Contract until the end of the Warranty period for the Vessel.
- 4.2 Drawings that must be delivered to Canada for review or acceptance are identified in the DID

M-017 System Drawing Requirements. Canada may request, by written notice from the Contracting Authority, the delivery of other drawings if created by the Contractor as part of the Work, or if provided to the Contractor by a Subcontractor as part of the Work, for Canada's review. If such drawings are requested, the Contractor must provide them within five (5) Business Days.

4.3 Drawings that are being submitted to the Classification Society or Transport Canada, for approval or guidance, must also be provided concurrently to the Technical Authority for information.

4.4 Reports, calculations and associated data produced or revised during the Work must be submitted in accordance with their respective DIDs **M-016 System Reports Requirements** and **M-018 System Calculation Requirements**.

5. Electronic Formats

5.1 Unless otherwise specified in individual DIDs, electronic copies of deliverables must be capable of being viewed using one or more of the following software versions where such deliverables would customarily be capable of being viewed or edited using such applications:

- a) Microsoft Office Suite 2010, including Word, Excel and PowerPoint
- b) McNeel Rhinoceros ('Rhino') 6.0
- c) AutoDesk Navisworks 2022
- d) AutoDesk AutoCAD 2022
- e) AutoDesk Design Review 2018
- f) Adobe Acrobat version 11

5.2 All deliverables must be in English. Where available, documents available in English and French must be delivered in both languages.

6. Design Development to Date

6.1 Much of the NSFRV concept development work was developed internally by CCG Vessel Procurement Engineering Support (VP-ES). RAL was the designer for the Contract Design and it has been appraised by class society.

7. Phase 1 – Design Completion

7.1.1 Phase 1 will be sub-divided into three phases:

- a) Phase 1A: Design Review
- b) Phase 1B: Complete Design Development
- c) Phase 1C: Production Engineering

7.1.2 The purpose of Phase 1A is to review and understand the design development to date. No design advancement will occur during Phase 1A. The Contractor will liaise with Canada and Single System Integrators (SSIs) to understand design development to date and comment on areas of concern in the design. The Contractor and its SSIs should review the design to further develop their familiarity with the design and then have a series of system kick-off meetings (defined below).

7.1.3 The Contractor must use the change process in accordance with DID **M-006 Configuration and Change Management Plan** if they determine that specific requirements or design aspects need to be revisited for producibility or fabrication standpoint. The onus is on the Contractor to rationalize the issue. Once understood and accepted by Canada, the Contractor is responsible for developing a solution. Canada will review and may accept the solution.

- 7.1.4 Once the Contractor and Canada confirm that the design is mutually understood by all, Phase 1A is complete. All actions that have been identified during Phase 1A have been discussed and agreed indicating their impacts on the scope of work and potential changes.
- 7.1.5 Phase 1B then entails design development to complete the design for the areas. The contractor must mature the design to the point where it is complete and ready to be constructed.
- 7.1.6 Prior to commencing the Production Engineering Phase (1C), the Contractor must complete the design such that it is ready for production engineering. On completion of the Complete Design Development Phase (1B) the Contractor must complete the Technical Baseline IAW DID T-005 **Technical Baseline**.
- 7.1.7 Phase 1c then entails production engineering.
- 7.1.8 A meeting between the contractor and Canada must be conducted at the end of each the three sub-phases mentioned above in section 7.1.1 to confirm completion status. This will ensure that the Contractor can initiate work on the following phase. All required deliverables must be delivered and reviewed by Canada prior to the meetings being held.

8. Phase 2 – Build

- 8.1 Phase 2 is defined by the build of the vessel and most deliverables need only be updated as required during the Build Phase.

9. Systems Integration

- 9.1 Canada ran competitive processes to select a number of SSIs during the Design Contract. The Contractor must use the same single systems integrators used during the NSFRV Design Contract. These SSIs must support the installation and commission of all equipment within their system scope during the Phase 2 – Build. During Phase 1, The SSIs must continue to design, integrate, and conduct performance verification of the following systems as the design develops for the following pre-selected SSIs:

- a) Propulsion SSI (Aspin Kemp and Associates)(Ref # F7013-200032/B)
- b) Deck Equipment SSI (Hawboldt Industries Ltd.)(Ref # F7013-200032/C)

Canada ran two competitive processes (Request for Identification of Potential Suppliers) to select the (SSIs) for the propulsion system and deck equipment for the new NSFRV. These SSIs have supported the design development and equipment selection during the design of the vessel. The scope of equipment to be provided by each of these SSIs was spelled out during their respective competitive selection processes and can be seen in Appendix 1 to Annex A. The intent going forward is for these SSIs to provide equipment for their respective systems and integrate it into the NSFRVs during the build.

The Contractor may plan to obtain directly from suppliers or OEMs the material and equipment necessary to provide the systems and suites identified below. However, for each of the following systems or suites, a single integrator must be responsible for the overall engineering design, integration, and testing for the applicable system or suite:

- a) Heating, Ventilation & Air Conditioning (HVAC) System Integrator
- b) Ship's Control & Monitoring System (SCMS)
- c) Bridge Equipment (Navigation, Communication, and Science)
- d) Noise

Total System Vessel Responsibility:

Notwithstanding the last sections (9.1) the Contractor must maintain Total System Vessel Responsibility (TSVR) for the Work performed by or on behalf of the Contractor under this Contract. TSVR includes but is not limited to:

- I. a system design and total system integration which includes the task of aggregating interconnecting, setting-to-work, testing, trials and making compatible all the Systems and Deliverables, including their associated software, so as to fulfil the performance and other requirements described in this SOW;
- II. placement and management of sub-contractors;
- III. ensuring that documentation and publications are sufficient to permit operation and maintenance of the systems and equipment which they depict;
- IV. ensuring the Contractor recommendations regarding spare parts are compatible with the systems and equipment components for which they are designed; and
- V. all other work required to ensure the NSFRV is fully functional and meets all the requirements of the Contract.

10. Project Management

10.1 Plans

- 10.1.1 The Contractor must manage the project using a Project Management system reflecting industry best practices, such as the Project Management Body of Knowledge (PMBOK) or equivalent.
- 10.1.2 The Contractor must update the existing Project Management Plan (PMP) and its subordinate plans developed as part of the bid as defined in DID **M-001 Project Management Plan** as required. Specifically, key personnel should be updated as it evolve for ease of communication during the Contract.
- 10.1.3 The Contractor must provide an Integrated Master Schedule in accordance with DID **M-002 Integrated Master Schedule**. The Master Schedule must allow time for Canada to review and respond to submitted deliverables in accordance with individual DIDs. The required review periods are listed in the CDRL.
- 10.1.4 The Integrated Master Schedule and subordinate schedule as defined herein and in the CDRL are to be kept current for the duration of this Contract and remain fully reflective of how the Work is conducted and consistent with other plans. If one aspect of a particular plan as defined in the DID is altered in any way, the deliverable must be updated accordingly and communicated via progress updates as defined below. Urgent matters should be brought to the attention of Canada as they arise.
- 10.1.5 Once construction has commenced, the Contractor must submit at least twenty-five (25) colour photographs of the Vessel with each monthly Progress Report in accordance with DID **M-013 Photographs and Models**.
- 10.1.6 The Contractor must provide scale models of the as-built NSFRV delivered under this Contract. The scale models must be provided in accordance with DID **M-013 Photographs and Models**.

10.2 Reports

10.2.1 Progress Reporting

- 10.2.2 The Contractor must submit a Progress Report in accordance with DID **M-011 Progress Reporting** every six weeks commencing after the kick-off meeting (defined below).

11. Meetings

- 11.1 The Contractor must schedule meetings in consultation with Canada. Meetings must be held on mutually agreed upon dates. Meetings may be held concurrently and in coordination with other meetings held for the NSFRV.
- 11.2 The Contractor must develop and deliver meeting agendas in accordance with DID **M-007 Meeting Agendas** for all meetings specified in this SOW.
- 11.3 The Contractor must record the minutes of all meetings summarizing the discussions and recording decisions reached in accordance with DID **M-008 Meeting Minutes**. Minutes will be signed off by the Contracting Authority, Technical Authority and by the Contractor.
- 11.4 Action items must be identified during meetings and tracked by the Contractor in an action item register. Each action item's status must be identified in subsequent meetings until the action item is closed, as agreed upon by Canada and the Contractor.
- 11.5 The Contractor must provide the facilities, materials and services required for the conduct of all meetings. All meetings must be held at the Contractor's premises, unless otherwise agreed to beforehand, and must be co-chaired by Canada and the Contractor.
- 11.6 Despite the conduct of meetings, urgent matters that require the immediate attention of Canada must be brought to the attention of the Technical Authority and Contracting Authority promptly within twenty four (24) hours of the event or is aware of the issue. The Contractor must not await the next formal meeting to communicate such matters to Canada.
- 11.7 **Kick-off Meetings**
 - 11.7.1 The Contractor must set up a kick-off meeting at the Contractor's facility with Canada no later than two (2) weeks following contract award. The purpose is to introduce the teams and review the contract and discuss the next steps.
 - 11.7.2 As described above at 7.1.2 , the Contractor must setup system level kick-off meetings at the Contractor's facility within a month of contract award. The kick-off meetings are also to include electrical/hybrid systems and for the following systems:
 - a) Propulsion
 - b) Deck Equipment
 - c) HVAC
 - d) Bridge Equipment

Attendees, must include SSIs and system OPIs from VP-ES. The purpose is to review the package for the respective systems and for the Contractor to understand design development to date.
- 11.8 **Progress Review Meetings (PRMs) / Technical Review Meetings (TRMs)**
 - 11.8.1 The Contractor must convene PRMs every six (6) weeks to be held via teleconference or in person at the Contractor's facilities. The purpose of the PRMs is to discuss cost, schedule, quality of the Work, progress, risks, issues and any other topics that affect the conduct of the Work. The PRM attendees from Canada will include the Contracting Authority, Technical Authority, and Inspection Authority and other attendees as indicated by Canada. The purpose of the TRMs is to discuss and resolve any technical issues with the design, system engineering, construction, ILS (as defined in section 15 below as ILS) and any other technical issues that affect the progress of the Work. Canada's participants for the TRM must include the Contracting Authority, Technical Authority, Inspection Authority, and other attendees as indicated by Canada.
 - 11.8.2 The date for the PRMs/TRMs must be confirmed with Canada at least ten (10) Business Days prior to the meeting. The PRM/TRM may be scheduled to be concurrent with the meetings detailed in 7.1.8.

- 11.8.3 The Contractor must present Progress Report every six (6) weeks for the period at each PRM in accordance with the requirements of DID **M-011 Progress Reporting**. Presentations from other meetings, included as attachments to the Progress Report in accordance with DID **M-011 Progress Reporting**, need not be presented at the PRM. The TRM portions will be driven by technical deliverables from the T DIDs as well as consideration for planning quality activities for inspections, test and trials.
- 11.9 **Builder's Dock Trial Meeting (BDTM)**
- 11.9.1 Prior to the conduct of the Builder's Dock Trials (BDTs), the Contractor must convene a BDTM. The BDTM must be a planning meeting to conduct a final review of the deliverables for DIDs **Q-006 Acceptance Plan**, **Q-003 Tests and Trials Plans** and **Q-005 Tests and Trials Agenda** and ensure overall readiness to commence BDTs.
- 11.9.2 A meeting between the Contractor and Canada must be conducted at the end of the BDT to confirm completion status. This will ensure that the Contractor has captured any deficiencies or issues to be addressed.
- 11.10 **Builder's Sea Trial Meeting (BSTM)**
- 11.10.1 Prior to the conduct of the Builder's Sea Trials (BSTs), the Contractor must convene a BSTM. The BSTM must be a planning meeting to conduct a final review of the DID **Q-003 Tests and Trials Plans** and **Q-005 Test and Trials Agenda** and ensure overall readiness to commence BSTs.
- 11.10.2 A meeting between the Contractor and Canada must be conducted at the end of the BSTs to confirm completion status. This will ensure that the Contractor has captured any deficiencies or issues to be addressed.
- 11.11 **Acceptance Conference**
- 11.11.1 The Contractor must convene an acceptance conference to mark the end of acceptance, to confirm that all acceptance activities are complete as defined in DID **Q-006 Acceptance Plan** and to formally deliver the NSFRV to Canada.
- 11.12 **Build Close-Out Meeting (BCOM)**
- 11.12.1 The Contractor must convene the BCOM to demonstrate that all Work is complete and all deliverables have been received and accepted.
- 12. Quality Management**
- 12.1 The Contractor must provide a Quality Plan (QP) delivered to Canada as part of the bid Contract in accordance with DID **Q-001 Quality Plan**. The QP must be consistent with and subordinate to the PMP and prepared in accordance with the current version of ISO 10005:2018 Quality Management - Guidelines for Quality Plans.
- 12.2 Upon acceptance of the updates to the QP by Canada, the Contractor must conduct the Work in accordance with the QP. The Contractor must make appropriate amendments to the QP throughout the term of the Contract to reflect current and planned quality management activities.
- 13. Engineering**
- 13.1 The Contractor must produce and deliver a final set of design drawings in accordance with DID **T-005 Technical Baseline**.
- 13.2 For all other engineering deliverables (Technical level or 'T DIDs') not specifically addressed in the SOW, the Contractor must provide an updated deliverable on an as required basis for the duration of this Contract if the final deliverable provided during the NSFRV Contract has changed and the deliverable is therefore no longer current.
- 13.3 The Contractor must produce revised Design Reports, as required, and in accordance with

DID T-005 Technical Baseline.

14. Build

- 14.1 The Contractor must build and equip one (1) NSFRV in accordance with the requirements defined in the Construction Specification and as reflected in the Technical Baseline to be delivered at the end of Phase 1.
- 14.2 The Contractor must manage any changes to the Technical Baseline during the build of the NSFRV in accordance with DID **M-006 Configuration and Change Management Plan**.
- 14.3 The Contractor must produce and deliver an as-built Technical Baseline reflecting the final NSFRV as-built configuration in accordance with DID **T-005 Technical Baseline**.
- 14.4 All OEM parts sourced should be repairable and replaceable within Canada. Where the contractor intends to source equipment outside of Canada that may not be replaceable and/or repairable within Canada, this should be identified to CCG prior to final selection and the rationale provided to Canada for the selection of the intended option. This will then be brought forward for discussion with Canada before a final selection is made.

15. Margins and Weight Control Program

- 15.1 The Contractor must update and implement a Weight Control Program developed as part of the Work in accordance with DID **T-096-3 Weight Control Program**
- 15.2 The Contractor must demonstrate the accuracy of the weight estimates and actual weights and how this applies to each entry in the Weight Estimate in accordance with DID **T-096-1 Weight Report**. The Contractor must implement a weight margin plan in accordance with DID **T-096-3 Weight Control Program** to ensure that the Vessel, as-built, is within the weight and center of gravity limitations as required in the Technical Baseline.
- 15.3 Throughout the Work, the Vessel weight estimate is to be updated and submitted to the Technical Authority in accordance with DIDs **T-096-3 Weight Control Program**. The weights and centers of gravity of items that are part of the Vessel must be determined and reflected in the Weight Estimate. The Weight Estimate must clearly state the actual known and estimated weights used to determine the Vessel weight. The consumption of margins as well as the rationale for consuming margins must be documented in the Weight Report. All weight control measures that are in use must be indicated in the report.
- 15.4 For materials, components, and equipment that are not individually measured, the Contractor must determine the mass on a selective or sampling basis, as determined by the Contractor, to provide unit weight data.
- 15.5 Where the Contractor uses factors or percentages, such as for estimating and calculating paint, mill tolerance and welding, the Contractor must substantiate these values by supplying background data in support of these calculations.
- 15.6 The Contractor must utilize a margin policy which reflects the levels of confidence in the weight, and is applied individually to each item in the weight report. This weight and moment allowance must account for design changes to the current weight due to ship drawing development, growth of Contractor-furnished material, omissions and errors in the ship drawings, outfitting details, variations between the actual ship and its curves of form, and other similar differences.
- 15.7 Prior to Vessel Acceptance, the Contractor must complete a lightweight survey for the Vessel in accordance with Classification Society Rules and Canadian Regulations, and report the results of this lightweight survey to the Technical Authority.
- 15.8 Upon completion of the NSFRV, the Contractor must conduct an inclining experiment in accordance with Transport Canada Marine Safety and Classification Society rules and regulations.

- 15.9 The Contractor must produce the inclining experiment report and associated calculations and must submit the report to the Technical Authority for review and comment within thirty (30) days of the experiment having been conducted.
- 15.10 The Contractor must conduct and maintain a Stability Analysis in accordance with DID **T-079 Stability Analysis** as required with any modification to the Vessel's configuration.
- 16. Acoustic Management Plan**
- 16.1 The Contractor must develop the Noise and Vibration Plan for the NSFRV in accordance with DID **T-073 Noise and Vibration**.
- 16.2 In the performance of the Work, the Contractor must engage the services of a professional noise control engineering firm for the development and monitoring of the noise control design and construction incorporated into the Vessel to ensure that the airborne noise, sonar self-noise and radiated noise performance requirements of the Construction Specification are met.
- 17. Acceptance**
- 17.1 Acceptance Objectives**
- 17.1.1 The objectives of acceptance activities are to:
- a) Verify that all requirements defined in the Construction Specification and related drawings have been met in accordance with DIDs **T-000 Compliance Matrix** and **T-005 Technical Baseline**.
 - b) Demonstrate that all equipment and systems on board the Vessel operate correctly in accordance with the design intent and Original Equipment Manufacturer (OEM) or integrator instructions
 - c) Ensure the Vessel has all necessary certifications as per Regulatory Bodies and Classification Society requirements
 - d) Ensure the Vessel is delivered to Canada:
 - i. Complete and free of all defects or deficiencies except for outstanding work agreed to and listed in the PWGSC 1105 form
 - ii. Fill diesel fuel oil tanks to 90% capacity
 - iii. Fill lube oil and hydraulic oil storage tanks and potable water tanks to 100%
 - iv. Fill all machinery system tanks (e.g. hydraulic, fresh water, header and expansion) to their normal operating levels
 - v. Clean and tidy
 - vi. Complete with load out items prepared for custody transfer in accordance with this Contract
 - e) Confirm that all other deliverables to be provided at acceptance in the CDRL have been received and accepted by Canada (Except for those agreed to and listed in the PWGSC 1105 form)
- 17.2 General**
- 17.2.1 The Contractor must provide an Acceptance Plan in accordance with DID **Q-006 Acceptance Plan** to reflect the process for Acceptance that spells out the schedule of Tests and Trials and inspection leading up to overall acceptance of the Vessel.
- 17.2.2 All activities in the DID **Q-006 Acceptance Plan** must be included in the NSFRV DID **M-002 Integrated Master Schedule**. The schedule must at a minimum include the development, review and approval of the acceptance activities and each of the individual acceptance activities. The schedule must clearly show the integration of the entirety of the Acceptance Plan. The Contractor must notify the Inspection Authority of all acceptance activities in

accordance with this Contract. The Inspection Authority must witness all acceptance activities although the Inspection Authority may waive their attendance at a specific Test, Trial, or Inspection by informing the Contractor in writing.

17.3 **Requirements Demonstration and Verification**

- 17.3.1 The agreed Acceptance Plan delivered as part of the NSFRV Contract defines the process for requirements demonstration and verification. The Contractor must use the DID **T-000 Compliance Matrix** in accordance with the Acceptance Plan.
- 17.3.2 Demonstration of requirements must progressively build on the Compliance Matrix delivered as part of the NSFRV Design Contract. Demonstration of requirements under this Contract may take the form of the following activities:
- a) Engineering design acceptance
 - b) Inspections (Inspection Authority and Regulatory bodies)
 - c) Functional and configuration audits
 - d) Factory Acceptance Tests (FATs)
 - e) Tests and Trials
- 17.3.3 In general, verification of requirements must take a structured approach commencing with design reviews demonstrating that the equipment, systems and Vessel as designed meet the requirements of DID **T-005 Technical Baseline**. Design reviews will be followed by physical audits or Inspections demonstrating that the equipment, systems and Vessel have been constructed in accordance with the Technical Baseline. Tests, Trials and demonstrations will then follow demonstrating that the equipment, systems and Vessel as an integrated system function correctly as designed and as contemplated by the OEM or integrator.

17.4 **Test and Trials**

- 17.4.1 The Contractor must organize and conduct to the satisfaction of the Inspection Authority, Classification Society and Regulatory Bodies a comprehensive Test and Trials program, in accordance with DID **Q-003 Tests and Trials Plan** to progressively demonstrate that the Vessel has been constructed in accordance with the Technical Baseline and fully complies with Classification Society, Transport Canada, other Regulatory Bodies, and the updated Construction Specification and that all Vessel equipment and systems operate correctly.
- 17.4.2 All Tests and Trials must be completed on individual components of the systems, and all identified defects corrected to the satisfaction of the Inspection Authority prior to the commencement of any Test or Trial on that system.
- 17.4.3 The Contractor must be responsible for all aspects of the execution of the tests and trials program including but not limited to:
- a) Safe conduct of the tests and trials program
 - b) All costs related to the test and trials program including the cost of fuel and lubricants
 - c) The provision of all personnel required to operate the equipment / systems being tested / trialed, personnel required to ensure that the tests and trials are conducted in accordance with the approved agendas and personnel required to record data
- 17.4.4 The Contractor must conduct Tests and Trials in accordance with the agreed DID **Q-003 Tests and Trials Plan** delivered under the NSFRV Contract to enable a logical, systematic progression which ensures that all associated components and equipment are proven prior to subsystems demonstration or testing, and subsystems are proven prior to system demonstration or testing. As a minimum, the Contractor must verify:
- a) Completeness of installation, correct rotation
 - b) Adequacy of power

- c) Ease of use and power functioning of controls
 - d) Uniformity of speed at any operating condition
 - e) Vibration of equipment or of adjacent piping
 - f) Freedom from noise in conformance with the Noise and Control Plan prepared under the NSFRV Contract
 - g) Absence of leaks (fluid, lubricants or gases)
 - h) Calibration and setting of alarm and limit devices
 - i) Adequate strength and stiffness of all machine parts and foundations
- 17.4.5 The Contractor must develop and deliver to Canada, in accordance with DID **Q-005 Tests and Trial Agenda**, agendas for all Tests and Trials activities that will clearly describe the methodologies and procedures to be used for each activity, and will cross reference all applicable Construction Specification requirements.
- 17.4.6 The Contractor must collect data and keep written records of all acceptance activities conducted in accordance with DID **Q-004 Tests and Trials Reports**. Records must be provided to Canada in accordance with DID **T-000 Compliance Matrix**.
- 17.5 **Factory Acceptance Tests (FATs)**
- 17.5.1 The Contractor must conduct FATs for all systems, machinery and equipment identified in the Acceptance Plan.
- 17.5.2 Shore based Trials, FATs, Tests must be completed in accordance with DIDs **T-000 Compliance Matrix** and **Q-005 Tests and Trials Agendas**. FATs must be conducted on systems and equipment identified in SNAME Technical and Research Bulletin 3-39, Guide for Shop and Installation Tests.
- 17.5.3 Where a Test is required by the Classification Society or Regulatory Bodies, the Contractor must inform Canada in order that Canada may witness the Test in conjunction with the Regulatory Bodies and Classification Society surveyors.
- 17.5.4 The Contractor must provide copies of the FATs procedures and the expected test results consistent with DID **Q-004 Tests and Trials Reports** to the Technical Authority. The agendas must include pass or fail criteria where there is a specified requirement.
- 17.5.5 The Contractor must include in the FATs protocol the systems, machinery and equipment identified as noise critical under through the Contractor's noise control program as identified in the Noise and Control Progress Plan (DID **T-073 Noise and Vibration**) and must undergo vendor-responsible FATs noise and vibration characteristics prior to shipment to the Contractor.
- 17.6 **Builder's Dock Trials (BDTs)**
- 17.6.1 The Contractor is to use the test and trials requirements for some of the these trials as described in Annex XX (TBD).
- 17.6.2 The Contractor must provide BDTs procedures to verify the installation and integration of each system in the Vessel in accordance with the agreed Technical Baseline.
- 17.6.3 The Contractor must conduct BDTs for all systems, machinery and equipment identified in the Acceptance Plan delivered in accordance with DID **Q-006 Acceptance Plan**. Agendas must be developed in accordance with DID **Q-005 Tests and Trials Agenda**. Results of the actual testing must be provided in accordance with DID **Q-004 Tests and Trials Reports**. BDTs documentation must clearly identify:
- a) Test and Trials Reports showing all Trials have been completed, documented and all trialed equipment or systems certified compliant, not compliant or for information only by the applicable Inspection Authority

- b) A report of all defects, deficiencies and deviations from BDTs and confirmation that all have been captured in the Defect and Deficiency Register as per DID **Q-007 Defects and Deficiencies Register**

17.7 **Builder's Sea Trials (BSTs)**

- 17.7.1 The Contractor is to use the test and trials requirements for some of these trials as described in Annex XX (TBD).
- 17.7.2 The Contractor must conduct BSTs for all systems, machinery and equipment identified in the Acceptance Plan. Agendas must be developed in accordance with DID **Q-005 Tests and Trials Agenda**. Results of the actual testing must be provided in accordance with DID **Q-004 Tests and Trials Reports**. BSTs documentation must clearly identify:
 - a) Test and Trials Reports showing all Trials have been completed, documented and all Tried equipment or systems certified compliant, not compliant or for information only by the applicable Inspection Authority
 - b) A report of all defects, deficiencies and deviations from BSTs and confirmation that all have been captured in the DID **Q-007 Defects and Deficiencies Register**

17.8 **Regulatory Inspections**

- 17.8.1 The Contractor must update and deliver to Canada a Regulatory Inspection Plan in accordance with DID **Q-002 Inspection Plan**. The Regulatory Inspection Plan must address when and how the Contractor will schedule and coordinate all inspections by the Classification Society, Transport Canada Marine Safety, and any other Regulatory Bodies involved in assessing the Vessel for compliance.
- 17.8.2 The Contractor must deliver certificates in accordance with DID **M-009 Class Review Register**.

17.9 **Inspections**

- 17.9.1 As part of the agreed Acceptance Plan, the Contractor must plan and schedule a series of Inspections for the Inspection Authority which progressively serves to:
 - a) Demonstrate that the Vessel has been constructed in accordance with the Technical Baseline and Good Shipbuilding Practice.
 - b) Verify that compartments are complete including markings, insulation, paint, labels and all fitted equipment planned to be installed at the time of the inspection.
 - c) Identify defects or deficiencies to be rectified at a later date.
 - d) Verify any tanks which are closed after inspection are properly coated, free from foreign material and debris and free from outstanding defects or deficiencies.
 - e) On completion of BSTs and prior to Vessel acceptance that loadout material and loose items are on board and properly stowed, or have been delivered to the agreed lay apart store.
 - f) Confirm that the Vessel is clean, all defects or deficiencies are resolved or properly recorded in the Defect and Deficiency Register and the Vessel is in all respects ready for delivery to Canada.

17.10 **Defects and Deficiencies**

- 17.10.1 The Work must be conducted such that little to no outstanding Work remains. Defects or deficiencies must be addressed within twenty four (24) to forty eight (48) hours of being reported. Canada will not accept outstanding defects or deficiencies related to safety of personnel, the ability of the Vessel to safely carry out its missions as detailed in the Technical Baseline and agreed during the Construction Engineering phase, or that impact any of the certificates required in accordance with DID **M-009 Class Review Register**.

- 17.10.2 Defect and deficiencies must be tracked across all acceptance activities and captured in a single register in accordance with DID **Q-007 Defects and Deficiencies Register (DDR)**.
- 17.10.3 Defects and deficiencies in the DDR must be prioritized in accordance with an agreed upon system of prioritization. The prioritization system must take into account the impact the defect or deficiency has on considerations such as:
 - a) Safety of personnel or material
 - b) The ability to successfully verify the operation of the remaining components of the equipment or system
 - c) The ability of the vessel to carry out its mission
 - d) Regulatory Bodies or Classification Society certification(s)
- 17.10.4 Prior to commencing any acceptance activity, the DDR must be reviewed for any outstanding defects and deficiencies related to the equipment or system affected. Normally, there should be no outstanding defects or deficiencies related to an equipment or system undergoing an acceptance activity. If there are outstanding defects or deficiencies, Inspection Authority and the Contractor must review the outstanding items and their priority and agree to allow the acceptance activity to proceed despite the defect or deficiency.

18. Integrated Logistic Support

- 18.1 The Integrated Logistic Support (ILS) scope of the following DIDs may be altered prior to the final release of the RFP.
- 18.2 The Contractor must submit ILS reports in accordance with the CDRL and DIDs accompanying this SOW. ILS is comprised of the activities required to support and operate the Vessel throughout its service life. The ILS elements to be delivered by the Contractor along with the Vessels are described in the following sections and the associated DIDs.
- 18.3 The Contractor must carry out failure modes and effects analysis as required by the Classification Society and Regulatory Bodies.
- 18.4 The Contractor is not responsible for preparing or submitting a Safety Management Plan for the Vessel as part of the Work.
- 18.5 The Contractor must provide an NSFRV Class Manual in accordance with DID **I-001 Class Manual**. The Class Manual must explain the function and general arrangement of the Vessel and its major systems and equipment.
- 18.6 The Contractor must deliver the necessary publications to operate and maintain the Vessel in accordance with DID **I-002 Vessel, System, and Equipment Manuals**. The Contractor must also provide Original Equipment Manufacturer (OEM) manuals in accordance with DID **I-003 Original Equipment Manufacturer Manuals and Technical Publications**.
- 18.7 The Contractor must provide Trim and Stability booklet reflecting Transport Canada Marine Safety and Classification Society requirements in accordance with DID **I-004 Trim and Stability Booklet**.
- 18.8 The Contractor must provide a Master Equipment List (MEL) that identifies all the systems and equipment fitted on the Vessel in accordance with DID **I-005 Master Equipment List**. The MEL should be locked down at the end of Phase 1 of the Contract and updated as required if the list evolves during Phase 2.
- 18.9 The Contractor must provide an Asset Breakdown Structure (ABS) in accordance with DID **I-006 Asset Breakdown Structure**. The ABS should be locked down at the end of Phase 1 of the Contract and updated as required if the list evolves during Phase 2.
- 18.10 The Contractor must provide a recommended spare parts list in accordance with DID **I-007 Recommended Spare Parts and Materiel List**. The Recommended Spare Parts List must include the following:

- a) Spares which are recommended by the Classification Society to meet guidance on minimum spare gear.
 - b) Identified spares which are required by the Construction Specification.
 - c) Recommended spares which are recommended by the Contractor or OEM to ensure continued availability of an equipment or system once in-service.
 - d) Identify the spares, repair parts and material needed to support operations for the first year.
 - e) Identify the spares and material purchased as installation and commissioning spares and/or base spares.
- 18.11 Mandatory spares must be provided by the Contractor as part of the Work. If required to be stowed on board, these spares must be properly identified and protected in good marine quality packaging suitable for the marine environment.
- 18.12 For the recommended spares, Canada will review the list of recommended items and may decide to purchase them from the Contractor as Additional Work.
- 18.13 The Contractor must provide updated Packaging, Handling, Storage, and Transportability information in accordance with DID **I-008 Packaging Handling Storage and Transportability Requirements List**, if the list has evolved since the last deliverable provided to Canada.
- 18.14 The Contractor must demonstrate a cohesive maintenance regime for the Vessel. An updated Initial Maintenance Task List must be provided in accordance with DID **I-009 Initial Maintenance Task List**. If the list or data has changed since the last deliverable provided to Canada, the list will be vetted via the first of two (2) Expert Panel Reviews (EPRs) to be led by the Contractor to determine the final Maintenance Task List. CCG maintainers will attend the EPR to provide insight. The final suite of agreed upon maintenance tasks or worksheets must be captured in the deliverable for DID **I-010 Maintenance Task Analysis**. The final suite of developed maintenance tasks will be vetted via the second EPR with CCG maintainers. From there, the final maintenance taskings and regime must then be captured in an overall maintenance plan to be developed in accordance with DID **I-011 Maintenance Plan**.
- 18.15 The Contractor must provide a list of any special tools and test equipment required in accordance with DID **I-013 Special Tools and Test Equipment**. The Special Tools and Test Equipment list must include the following:
- a) Mandatory special tools and test equipment which are required to meet minimum Classification Society requirements.
 - b) Mandatory special tools and test equipment which are required by the Construction Specification.
 - c) Recommended special tools and test equipment required to conducted all maintenance activities defined in the Initial Maintenance Task List.
 - d) Identify the special tools and test equipment purchased for installation and commissioning.
- 18.16 Mandatory special tools must be provided by the Contractor as part of the Work. If required to be stowed on board, these tools must be properly identified and protected in good marine quality packaging suitable for marine environments.
- 18.17 For the recommended special tools and test equipment spares, Canada will review the list of recommended items and may decide to purchase them from the Contractor as an Additional Work.
- 18.18 The Contractor must provide a list of Recommended Training in accordance with DID **I-014 Training Recommendations and Analysis**. Following agreement from Canada, the

recommended training items and relevant curriculum must be developed in accordance with **DID I-015 Training Materials and Course Delivery**. Once these plans are finalized, the Contractor must implement them to deliver technical training to Ship's crew and shore-based personnel. The shore-based personnel may consist of up to two (2) CCG electronic technicians and two (2) CCG marine engineers. The ship's crew may consist of up to eight (8) CCG engine room staff and eight (8) CCG deck staff. CCG vessel's staff present for training will have the Transport Canada Marine Certifications appropriate for their positions. Canada will provide a list of the certifications for the Vessel crew as necessary for the training. The selected training must occur prior to the delivery of the Vessel.

- 18.19 The Contractor must provide obsolescence information for applicable equipment in accordance with **DID I-016 Obsolescence Notices**.
- 18.20 For any hazardous products, Material Safety Data Sheets must be provided in accordance with **DID I-018 Material Safety Data Sheets**.
- 18.21 The Contractor must provide an engineering drawing package that reflects the as-built configuration of the NSFRV, and includes all drawings submitted to the Classification Society for information and all Classification Society approved drawings, in accordance with **DID I-019 As-Fitted Drawing Package** and **DID I-020 Equipment Certification Register**.

Appendix A-1

NSFRV Build Contract Deliverables Requirements List (CDRL)

DIDs are specified as either requiring Canada to “Accept” (A) or “Review” (R). Those requiring acceptance, must be accepted by Canada before the Contractor can progress the work for that particular requirement or deliverable. Those that need only be reviewed will still need to be accepted by Canada, however, Work for the requirement can progress as the Contractor works to address any of Canada’s outstanding comments.

If a DID has an ‘Initial Submission’ or ‘Frequency’ timeline of “As Required” within the CDRL, the Contractor must update the deliverable associated with a particular DID if even a single aspect of the Contractor’s approach to meeting the requirement has changed. The Contractor does NOT need to update all sections of the deliverable if only a section of the deliverable has been revised.

Unless otherwise specified, deliverables, issues, comments or questions must be provided in Microsoft Office Suite format.

DID Naming Convention: DIDs are divided into four separate categories:

- M series DIDs are those that address project management, experience and governance requirements.
- T series DIDs are those that address technical requirements.
- Q series DIDs are those that address quality management and validation.
- ILS series DIDs are those that address integrated logistics support requirements.

Acronyms

MACA= Month(s) After Contract Award

BDT= Builder’s Dock Trials

BST= Builder’s Sea Trials

DID Number	Title	Version	Accept/ Review	Initial Submission	Subsequent Submission(s)	Frequency	Review Period	Language of Deliverables
GOVERNANCE								
M-001	Project Management Plan	Rev. 0	R	1 MACA	As required	As required	5 Working Days	English
M-002	Integrated Master Schedule	Rev. 0	R	1 MACA	Each PRM	Every 6 weeks	5 Working Days	English
M-003	Risks and Issue Management Plan including the Risks and Issues Register	Rev. 0	R	1 MACA	Each PRM	Every 6 weeks	5 Working Days	English
M-004	Cost Estimate	Rev. 0	R	1 MACA	-	-	15 Working Days	English
M-005	Technical Data Management Plan and Technical Data Register	Rev. 0	R	1 MACA	Each TRM	Every 6 weeks	5 Working Days	English / French
M-006	Configuration and Change Management Plan	Rev. 0	R	1 MACA	As required	As required	5 Working Days	English
M-007	Meeting Agendas	Rev. 0	R	5 Working Days prior to each meeting	-	As required	5 Working Days	English
M-008	Meeting Minutes	Rev. 0	R	5 Working Days after each meeting	-	As required	5 Working Days	English
M-009	Class Review Register	Rev. 0	R	As required	As required	As required	5 Working Days	English / French
M-011	Progress Reporting	Rev. 0	R	1 MACA	Each PRM	Every 6 weeks	5 Working Days	English
M-013	Photographs(1) and Models(2)	Rev. 0	R	Start of build phase (1) 4 weeks prior to vessel acceptance(2)	Each TRM(1)	Every 6 weeks (1)	5 Working Days	English / French
M-016	System Report Requirements	Rev. 0	R	As defined by related T DID	As required	As required	-	English / French

M-017	System Drawing Requirements	Rev. 0	R	As defined by related T DID	As required	As required	-	English / French
M-018	System Calculation Requirements	Rev. 0	R	As defined by related T DID	As required	As required	-	English / French
M-019	Arrangement Drawing Requirements	Rev. 0	R	As defined by related T DID	As required	As required	-	English / French
M-020	Engineering Maturity Management Plan	Rev. 0	R	As required	As required	As required	10 Working Days	English
M-021	3D Modelling Development Plan	Rev. 0	R	As required	As required	As required	10 Working Days	English
QUALITY MANAGEMENT								
Q-001	Quality Plan	Rev. 0	A	1 MACA	As required	As required	15 Working Days	English
Q-002	Inspection Plan	Rev. 0	A	15 working days prior to Production Engineering Meeting	As required	As required	15 Working Days	English
Q-003	Tests and Trials Plan	Rev. 0	A	15 working days prior to Production Engineering Meeting	-	As required	15 Working Days	English / French
Q-004	Tests and Trials Reports	Rev. 0	A	5 Working Days after completion of the particular test or trial	-	As required	15 Working Days	English / French
Q-005	Tests and Trials Agenda	Rev. 0	A	20 Working Days prior to the first instance of	-	As required	15 Working Days	English / French

					the particular test or trial						
Q-006	Acceptance Plan	Rev. 0	A	15 working days prior to Design Review Meeting	As required	As required	10 Working Days	English / French			
Q-007	Defects and Deficiencies Register	Rev. 0	R	1 Month after start of build phase	Each TRM	Every 6 weeks	5 Working Days	English / French			
INTERGRADED LOGISTIC SUPPORT											
I-001	Class Manual	Rev. 0	A	Two months prior to the delivery of vessel	-	-	15 Working Days	English / French			
I-002	Vessel, System, and Equipment Manuals	Rev. 0	A	Two months prior to the delivery of vessel	-	-	15 Working Days	English / French			
I-003	Original Equipment Manufacturer Manuals and Technical Publications	Rev. 0	A	Two months prior to the delivery of vessel	-	-	15 Working Days	English / French			
I-004	Trim and Stability Booklet	Rev. 0	A	Two months prior to the delivery of vessel	-	-	15 Working Days	English / French			
I-005	Master Equipment List	Rev. 0	A	1 MACA	5 Working Days prior to PRM/TRM	As required	15 Working Days	English / French			

I-006	Asset Breakdown Structure	Rev. 0	R	1 MACA	5 Working Days prior to PRM/TRM	As required	15 Working Days	English / French
I-007	Recommended Spare Parts and Materiel List	Rev. 0	R	3 MACA	10 Working Days prior to PRM/TRM	As required	15 Working Days	English / French
I-008	Packaging, Handling, Storage and Transportability Requirements List	Rev. 0	R	3 MACA	10 Working Days prior to PRM/TRM	As required	15 Working Days	English / French
I-009	Initial Maintenance Task List	Rev. 0	R	3 MACA	10 Working Days prior to PRM/TRM	As required	15 Working Days	English / French
I-010	Maintenance Task Analysis	Rev. 0	R	3 MACA	As required	As required	15 Working Days	English / French
I-011	Maintenance Plan	Rev. 0	A	6 MACA	As required	As required	15 Working Days	English / French
I-013	Special Tools and Test Equipment	Rev. 0	R	6 MACA	As required	As required	15 Working Days	English
I-014	Training Recommendations and Analysis	Rev. 0	R	3 MACA	As required	As required	15 Working Days	English
I-015	Training Materials and Course Delivery	Rev. 0	A	6 MACA	As required	As required	15 Working Days	English / French
I-016	Obsolescence Notices	Rev. 0	R	6 MACA	As required	As required	15 Working Days	English / French
I-017	Disposal Plan	Rev. 0	R	6 MACA	As required	As required	15 Working Days	English / French
I-018	Material Safety Data Sheets	Rev. 0	R	To be onboard as required by regulations as	As required	As required	Check will be completed as part of Vessel Acceptance	English / French

					systems installed Final copies 15 working days prior to vessel Acceptance						
I-019	As-Fitted Drawing Package	Rev. 0	A	12 MACA	25 Working days prior to the delivery of the vessel and 15 Working days prior to the vessel Acceptance	-	15 Working Days	English / French			
I-020	Equipment Certification Register	Rev. 0	R	3 MACA	As required	As required	15 Working Days	English / French			
I-022	Inventory of Hazardous Materials	Rev. 0	R	12 MACA	20 Working days prior to the vessel Acceptance	As required	10 Working Days	English / French			
I-023	Life-Cycle Costing Analysis	Rev. 0	R	3 MACA	As required	As required	15 Working Days	English			
TECHNICAL											
T-000	Compliance Matrix	Rev. 0	R	15 working days prior to Design Review Meeting	15 working days prior to Complete Design development Meeting	-	15 Working Days	English			

T-001	Design Review Reports	Rev. 0	A	No later than 15 working days prior to the Design Review Meeting	-	-	15 Working Days	English
T-005	Technical Baseline	Rev. 0	A	15 working days prior to Complete Design development Meeting	-	-	15 Working Days	English
T-041	Construction Specification	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working Days	English
T-043	Margins	Rev. 0	A	1 month after start of Design Review	-	-	15 Working Days	English / French
T-051	Fuel Endurance	Rev. 0	R	15 working days prior to Design Review Completion	15 days after Complete of Test and Trials Program	-	15 Working Days	English / French
T-073	Noise and Vibration	Rev. 0	A	Initial part of DID 15 working days prior to Design Review Meeting	Remainder of DID 15 working days prior to final Complete Design Development Meeting	-	15 Working Days	English / French

T-074	Welding Schedule	Rev. 0	R	15 working days prior to Complete Design Development Meeting	As required	As required	15 Working Days	English
T-078	Bill of Material	Rev. 0	R	15 working days prior to Complete Design Development Meeting	15 working days prior to final Production Engineering Meeting	As required	15 Working Days	English / French
T-079	Stability Analysis	Rev. 0	R	1 month after start of Design Review	As required	As required	15 Working Days	English / French
T-096-1	Weight Report	Rev. 0	R	1 month after start of Design Review	Each TRM	Every 6 weeks	5 Working Days	English / French
T-096-2	Lightship Weight Estimate	Rev. 0	R	1 month after start of Design Review	Each TRM	Every 6 weeks	5 Working Days	English / French
T-096-3	Weight Control Program	Rev. 0	A	1 month after start of Design Review	As required	As required	15 Working Days	English / French
T-171	Mast Structure and Analysis	Rev. 0	R	15 working days prior to Complete Design Development Meeting	As required	As required	15 Working Days	English

T-200	Torsion Vibration and Whirling Analyses	Rev. 0	A	1 month after start of Complete Design Development phase	As required	As required	15 Working Days	English
T-201	Main Machinery Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting	As required	As required	15 Working Days	English / French
T-204	Engine-Generator Solid Body Dynamic Analysis	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working Days	English
T-207	Propeller Test Reports and Design Package	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-208	Propulsion System Alignment	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

T-235	Electric Propulsion System	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-245	Azimuthing Thrusters	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-256	Sea Water Cooling System	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-259	Intakes and Exhaust System	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-291	Selective Catalytic Reduction (SCR) and Diesel Exhaust Fluid (DEF) Systems	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French

T-300	Hybrid Electric Power Generation and Distribution Systems	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-301	Electrical Equipment Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-302	Electrical Equipment – IP Ratings	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-303	Coordination Analysis	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-304	Cable Tray and Schedule	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English

T-305	Receptacles Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English
T-310	Power Quality and Total Harmonic Distortion	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English
T-325	Electrical Load Analysis	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-326	Electrical Single Line Diagrams	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French
T-327	Power Management System	Rev. 0	A	15 working days prior to Complete Design Development Meeting	-	-	15 Working days	English / French

T-328	Fault Current Analysis	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-330	Lighting System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-405	Mast and Antenna Arrangements	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-406	Antenna Arrangement Electromagnetic Compatibility Analysis	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-420	Navigation Systems	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

T-428	Bridge Consoles	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-430	Internal Data Transmission Systems	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-436	Fire Detection System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-438	Ship Control and Monitoring System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-438.1	Propulsion Control System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

T-440	External Data Transmission	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-460	Science Sonar and Transducers	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-501	Auxiliary Machinery Arrangements	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-512	Heating, Ventilation, Air Conditioning (HVAC)	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-521	Firemain Systems	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

T-522	Water Mist System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-524	Scientific Sea Water System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-526	Scuppers and Drains System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-528	Black and Grey Water System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-529	Bilge & Ballast System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

T-533	Domestic Fresh Water System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-543	Lubrication Oil Fill, Transfer and Purification System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-544	Oily Bilge and Waste Oil Systems	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-551	Compressed Air System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-555	Fixed Fire Fighting System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

T-556	Hydraulic Systems	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-568	Bow Tunnel Thruster Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-581	Anchoring and Stowage System	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-582	Mooring and Towing Systems	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-591	Mission Equipment	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

T-601	General Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-602	Hull Designations and Markings	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-631	Coating and Surface Treatment Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-633	Cathodic Protection System and Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-634	Deck Covering Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

T-635	Insulation Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-640	Compartment Arrangements	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-666	Working Deck Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English
T-668	Bridge Arrangement	Rev. 0	A	15 working days prior to Complete Design Development Meeting		-	15 Working days	English

DID M-001 Project Management Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Project Management Plan (PMP).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-002 Integrated Master Schedule
DID M-003 Risks and Issue Management Plan including the Risks and Issues Register
DID M-005 Technical Data Management Plan and Technical Data Register
DID M-006 Configuration and Change Management Plan
DID Q-001 Quality Plan

3. PREPARATION INSTRUCTIONS:

Format:

The PMP must be prepared in the Contractor's format and reviewed by Canada.

The PMP must be provided in a searchable Portable Document Format (PDF) format for all versions prior to the final version. The final version of the PMP must be provided in both Microsoft Word format and PDF files.

Requirements:

The Contractor must prepare a PMP that conforms to standard project management practices such as A Guide to the Project Management Body of Knowledge (latest edition) and describes in appropriate detail all aspects of how the Contractor will effectively manage a complex ship construction project to achieve the objectives.

The PMP must address the project management plan elements as presented in the table below.

In some cases, elements are to be further elaborated in accordance with a specific and subordinate DID (ex. DID M-003 Risks and Issue Management Plan including

the Risks and Issues Register). In other cases, the Contractor may determine whether a subordinate plan is required. Regardless of whether a subordinate plan exists, the PMP must provide sufficient detail so that the Contractor's strategy to address each element is clear.

Project Management Plan Elements	Data Description
1. Executive Summary	Description of the objective(s) and the intended result(s) of the project. Definition of the quantitative and measurable objectives that can be used as criteria to assess the success of the project.
2. Integration Management	Description of all processes required to unify, coordinate and manage all project elements to completion and how integration will be accomplished. <u>Subordinate DID:</u> M-002 Integrated Master Schedule
2.1. Project Lifecycle	Description of the Project lifecycle that links the various activities conducted by the Contractor (or its subcontractors), and shows the major flows between discrete design development lifecycles in relation to the overall Project lifecycle. The Project Lifecycle description must include details of any Gate reviews that are planned to evaluate the overall technical, cost and schedule risk at regular intervals. <u>Subordinate DID:</u> M-002 Integrated Master Schedule
2.2. Project Governance	Illustration of the corporate and Customer governance bodies that may be involved in the approval process and a description of their roles and responsibilities. Illustration of the project team structure and relationships.
2.3. Roles and Responsibilities	Listing of the major roles identified in the project team structure diagram.

Project Management Plan Elements	Data Description
	Listing of internal and external project stakeholders who are not specifically members of the project team, including a description of their relevance to the project and their degree of interaction for specific project activities.
2.4. Change Management	<p>Description of how change will be managed throughout the Contract. This must include change management processes (i.e. change control and issue management), roles and responsibilities, tools and techniques and reporting.</p> <ul style="list-style-type: none"> a. Description of the change control process including change governance, change identification and request management, impact analysis, change approval process, and change tracking; and b. Description of the issue management process to capture and maintain information on all issues including how the issues are classified and prioritized based on the assessment of their impact, the escalation process that is applied when an issue cannot be resolved at the level where it was identified. <p><u>Subordinate DIDs:</u></p> <p>M-003 Risks and Issue Management Plan including the Risks and Issues Register</p> <p>M-006 Configuration and Change Management Plan</p>
2.5. Document & Record Management	<p>Description of the management arrangements to manage and control Documents & Records that the Project will create.</p> <p><u>Subordinate DID:</u></p> <p>M-005 Technical Data Management Plan</p>
2.6. System Engineering Management	Description of the system engineering approach providing the framework and guidance for all engineering activities.

Project Management Plan Elements	Data Description
3. Scope Management	Description of how scope will be managed throughout the Contract including scope verification and control, development of work breakdown structure (WBS), roles and responsibilities, tools and techniques and reporting.
3.1. Scope Statement	Scope statement describing what is within and what is not within Product scope (the features and functions of the Vessel) and Project scope (the work required to execute the Contract).
3.2. Requirements Management	Description of how requirements will be gathered, detailed, validated, controlled and managed including the tools and processes that will be used, such as requirements traceability. <u>Subordinate DID:</u> M-006 Configuration and Change Management Plan
3.3. Configuration Management	Description of what configuration management tools and techniques will be employed to maintain the various configuration baselines (technical, contractual, schedule etc.). <u>Subordinate DID:</u> M-006 Configuration and Change Management Plan
3.4. Specialized Information Technology (IT) Tools and Software	Description on what specialized IT tools and software are required to complete the Project, specifically: <ul style="list-style-type: none"> a. Finite element analysis tools; b. Computational fluid dynamics tools; c. Product modeling tools; d. Stability analysis tools; e. Product Lifecycle Management tools; f. Project Controls & Analysis tools; g. Production Control tools; and

Project Management Plan Elements	Data Description
	<p>h. Shared Data Environment.</p> <p>Details of the requisite qualifications and experience of Project personnel, and/or the learning and development plans to attain and maintain the required skills to effectively utilize these tools and software must be included in section 6.1 Human Resources Acquisition of the PMP.</p>
3.5. Project Deliverables	<p>Listing of the major items to be delivered including the recipients, interim and final delivery dates, and delivery method.</p> <p>The list must differentiate non-technical deliverables (e.g. project schedule, communication plan, progress report, etc.) from technical deliverables (i.e. Vessel, technical documents, operating manuals etc.).</p>
3.5.1. Work Activities	<p>Description of the work activities to be performed. A WBS must be used to depict the work activities and the relationships among work activities.</p> <p><u>Subordinate DID:</u></p> <p>M-002 Integrated Master Schedule</p>
4. Schedule Management	<p>Description of how the schedule (current shared and drafts thereof (i.e. Contractor's version numbering GFx) will be managed throughout the Contract including:</p> <ul style="list-style-type: none"> a. Tools, techniques and processes used to <u>develop</u> and <u>update</u> the schedule (such as adding new activities to a WBS element or changing activities); and b. Roles and responsibilities.
4.1. Critical Milestones	<p>Description of the critical milestones (phases, stages, decision gates, approval of a deliverable, etc.). A high-level project schedule must be included.</p>
4.2. Schedule Control & Progress Monitoring of Current Shared	<p>Description of the control mechanisms that will be used to measure the progress of the work, and</p>

Project Management Plan Elements	Data Description
Schedule and Drafts Thereof (i.e. GFx)	<p>Project performance (in terms of schedule, cost and quality).</p> <p>Description of the methods and tools used to compare actual performance to planned performance and to implement and manage corrective action(s) when actual performance deviates from planned or required performance.</p> <p>Description of how and when schedules will be modified and how agreement and commitment to the revised schedules will be achieved.</p>
5. Quality Management	<p>Description of how quality will be managed throughout the Contract to ensure quality of deliverables including:</p> <ul style="list-style-type: none"> a. Processes that will be used during quality planning; b. Definition of quality standards; c. Governance, roles and responsibilities; d. Tools and techniques; e. Continuous improvement (including identification of lessons learned); and f. Reporting. <p><u>Subordinate DID:</u> Q-001 Quality Plan</p>
5.1. Quality Assurance	Description of how quality assurance will be managed including governance, roles and responsibilities, tools and techniques and reporting.
5.2. Quality Control	Description of the mechanisms to be used to measure and control the quality of the Vessel including verification and validation, peer reviews, Gate reviews, product testing etc.
6. Human Resource Management	Description of how human resources will be managed throughout the Contract including how resource requirements will be determined, how resources will be acquired, how they will be developed and managed, roles and

Project Management Plan Elements	Data Description
	responsibilities, tools and techniques and reporting.
6.1. Human Resources Acquisition	Identification of the number of human resources needed by skill area or project role and the duration for which each resource is needed. Description of the anticipated resource profile (the mix of skills and effort levels needed at various times in the project), when people will be added to the project or depart from it, and how new team members will be oriented.
6.2. Infrastructure	Description of the infrastructure including office space and facilities.
7. Communication Management	Description of how communications will be managed throughout the Contract including processes that will be used to plan communications, identify and manage stakeholders, determine communication requirements, roles and responsibilities, tools and techniques.
7.1. Stakeholder Analysis	Description of key stakeholders and how they will impact and be impacted by the project.
7.2. Project Reporting and Communication	Description of the reporting mechanisms, report contents, and information flows used to communicate the status of requirements, schedule, budget, quality, risks, and other status indicators.
7.3. Metrics Collection	Description of the methods, tools, and techniques used to collect and retain project metrics required to report on the project performance including: <ul style="list-style-type: none"> a. The metrics to be collected; b. The collection frequency; and c. How the metrics will be validated, analyzed, reported, stored, and used.
8. Risk Management	Description of the plan for identifying (initial and ongoing identification), analyzing, and prioritizing project risks including: <ul style="list-style-type: none"> a. The procedures for risk response planning;

Project Management Plan Elements	Data Description
	<p>and</p> <p>b. The methods used in tracking risks, evaluating changes in individual risk exposures, and responding to those changes.</p> <p><u>Subordinate DID:</u> M-003 Risks and Issue Management Plan including the Risks and Issues Register</p>
9. Subcontract Management	Description of how work will be subcontracted throughout the Contract, including specific departmental procedures and processes that will be used to conduct make/buy decisions and control any work that is subcontracted.
10. Procurement Management	Description of how procurement will be managed throughout the Contract including specific departmental procedures and processes that will be used to develop procurement plans, solicitations, purchase, control the contract and manage vendors.
11. Information Management	<p>Description of how the principles of Information Management will be applied.</p> <p>Description of standards, processes and Information Technology (IT) tools and software that will be utilized to ensure efficient management of information assets.</p> <p><u>Subordinate DIDs:</u> M-005 Technical Data Management Plan and Technical Data Register Q-001 Quality Plan</p>
12. Security Aspects	Description of the Security Aspects for the Project.

4. DELIVERABLES:

One (1) electronic copy of the PMP must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID M-002 Integrated Master Schedule

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Integrated Master Schedule (IMS).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001 Project Management Plan
DID M-003 Risks and Issue Management Plan including the Risks and Issues Register
DID M-006 Configuration and Change Management Plan
DID M-011 Progress Reporting
DID Q-003 Test & Trials Plan

3. PREPARATION INSTRUCTIONS:

Format:

The IMS must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The IMS must be provided to Canada in Portable Document Format (PDF) and MS Project format.

Requirements:

The IMS must be fully integrated (a single schedule with all work packages included) reflecting the execution plan/strategy of each work element as described in the Management Plans.

The IMS must include at a minimum:

- a. The Contractor's Work Breakdown Structure to at least planning level 3;
- b. All activities including baseline start and finish as per the latest approved version, assigned resources, duration, start and finish dates and deliverables to achieve the objective(s) of each discrete work package within the Contractor's Work Breakdown Structure (WBS);
- c. All milestones, including dates for the following:

- i. Significant project events
 - ii. Significant project payment milestones; and
 - iii. Significant project performance reviews.
- d. The planned sequence between activities within and across work packages;
- e. The identification of activities and/or events in the IMS that are in response to risk mitigation actions in the Contractor's risk register. The Contractor must ensure a clear link between the activity/event in the IMS and the risk register; and
- f. A Gantt chart.

The initial baselined IMS and updated version as a result of a formal approved contract change request will be included in the Performance Measurement Baseline (PMB). To establish the baseline, the IMS must contain the following quality criteria:

- a. Assurances with supporting evidence that the IMS is realistic and optimized,
- b. Validation of the quality of the IMS by the Contractor's internal project management teams and subject matter expert(s);
- c. No missing logic - all activities should have at least one predecessor and one successor associated with it:
 - i. No open-ended activities;
 - ii. One start activity/milestone; and
 - iii. One finish activity/milestone.
- d. No negative float;
- e. No negative lags (leads);
- f. No hard constraints;
- g. A sufficiently detailed schedule - activities should not have a high duration relative to the project's duration; and
- h. No start-to-finish (SF) relationships.

The Contractor must include the rationale in the IMS should the schedule not meet any or all of the quality criteria above.

More detailed work packages may be prepared below the baselined IMS (PMB) on a rolling wave basis. These work packages must be part of the IMS and must meet the quality criteria above including:

- a. Proper linkages and relationships are established between lower-level work packages and the Contractor's Work Breakdown Structure within the

- IMS PMB in order to avoid illogical time-driven connections, invalid dates, and out-of-sequence status conditions;
- b. Dates of lower-level work packages are within the constraints of the IMS PMB work packages; and
 - c. Work packages are not to exceed two months in duration.

Requests to change the baselined IMS must be submitted in accordance with the Contractor's configuration and change management plan (DID M-006).

IMS updates must depict the actual status of Work done up to the reporting period and include actual progress data (at a minimum, activity % complete, actual start and finish dates) with:

- a. No activity starting (or that have started) outside the expected baselined period relative to the baselined activities starting (or that should have started) within this period; and
- b. No activity finishing (or that have finished) outside the expected baselined period relative to the baselined activities finishing (or that should have finished) within this period.

The IMS must show the data date on which the IMS status is being determined:

- a. For the initial baselined IMS, the data date is the project commencement date; and
- b. For schedule updates, the data date is the reporting period cut-off date which must be within the respective reporting period.

IMS updates must include a record of all changes that the Contractor has implemented, in accordance with the process defined in the Contractor's Configuration and Change Management Plan.

IMS updates will be a standing item on the Progress Review Meeting agenda and must be provided to both the Technical Authority and Contracting Authority in accordance with the NSFRV Build Contract CDRL.

4. DELIVERABLES:

One (1) electronic copy of the IMS must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID M-003 Risks and Issue Management Plan including the Risks and Issues Register

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Risk and Issue Management Plan (RIMP) and Risks and Issues Register (RIR).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001 Project Management Plan (PMP)
PMBOK
The Standard for Risk Management in Portfolios, Programs, and Projects

3. PREPARATION INSTRUCTIONS:

Format:

The Risk and Issue Management Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The RIMP must be provided in a searchable Portable Document Format (PDF) for all versions prior to the final version.

The RIR must be provided in Microsoft Excel format for initial version and all revised versions. Each revision must include version control details including date, version number, clear indication of modified risk or issue and a brief description of the changes.

Requirements:

The Contractor must have a plan and a process to manage issues and risks in accordance with industry best practices.

The RIMP must include the Contractor's strategy and plan to identify, describe, assess, manage and mitigate issue/risk that could impact on achievement of project objectives. The RIMP must contain the following, at a minimum:

- a. Risk and Issue management planning; including the concept for management, explanation of risk tolerance, processes, evaluation criteria, and how results will be documented and reported.
- b. Risk and Issue identification methodology
- c. Risk assessment methodology, both qualitative and quantitative risk and opportunity analysis methodologies should be covered and a risk assessment criteria matrix must be used.
- d. Risk and Issue response planning methodology; both risk response and implementation strategies to be provided
- e. Risk and Issue monitoring and control, including reporting methodology to the Contractor's corporate management and Canada.

The Contractor must record project risks and issues in an Risks and Issues Register (RIR) that must be kept up to date.

The RIR must include sufficient detail for each phase of the risk management process (Identification, Assessment, Monitoring and Closure) to allow a full understanding of the risk/issue and proposed response option(s), response actions, monitoring findings, and closure details.

The Register must, at a minimum, include the following information:

- a. Date the risk and issue was raised
- b. Risk ID number
- c. Indication of new, revised and closed risk items
- d. Description of the risk or issue (including when a risk is moved to an issue)
- e. Owner of the risk or issue;
- f. Risk Category
- g. Explanation of the impact of the risk or issue;
- h. Risk Rating; probability, impact, matrix score.
- i. Risk Response strategy, including options (if applicable)
- j. Risk Response action including plan, action choices (if applicable) and contingency plan (if applicable)
- k. Status of the risk or issue; including updates
- l. Date the risk and issue was or is projected to be resolved.

The **Risks and Issues Register** must be updated as required and a current version must be referenced in the Monthly Progress Report and must be a standing agenda item at both the Progress Review and Technical Review Meetings for review and status update.

However, all risks with criteria rating of medium or moderate and above for likelihood or impact must be reported to Canada as they happen. A detailed explanation for planning and response is to be provided including; risk tolerance and consequences.

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File No. - N° du dossier
[Insert File #]

Buyer ID – Id de l'acheteur
[Insert Buyer ID]

Canada will conduct an initial evaluation of the RIMP and RIR as well as ongoing quality and performance assessment through the review of the RIR, if determined necessary Canada may request further information and may increase review intervals.

The RIMP and RIR must be consistent with PMI Project Management methodologies as covered in the latest versions of the PMBOK and The Standard for Risk Management in Portfolios, Programs, and Projects.

4. DELIVERABLES:

One (1) electronic copy of the Risk and Issue Management Plan must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

One (1) electronic copy of the Risk and Issue Register must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID M-004 Cost Estimation

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Cost Estimation.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID I-006 Asset Breakdown Structure (ABS)

3. PREPARATION INSTRUCTIONS:

Format:

The specific format of the report must be developed by the Contractor and agreed to by Canada. The cost breakdown must be in accordance with the recognized Contractor's Work Breakdown Structure (CWBS).

Requirements:

The estimate must include:

- a. A cost breakdown of equipment, material and labour by main weight and / or work groups, with sub-groups developed to a level appropriate to the design maturity;
- b. The point estimate, defined as the deterministic estimate with no uncertainty applied, summarized for each main weight group;
- c. Level of confidence associated with the point estimate;
- d. Shipyard Costs as defined in the Contract;
- e. A summary of cost breakdown complete with margins; and
- f. Identification of any reasonably foreseeable financial risks associated with the potential for regulatory changes.

The Cost Estimate Model (CEM) and Cost Estimate Report (CER) must be presented to Canada according to the requirements listed below.

Cost Estimate Model (CEM)

- a. The CEM format must be provided in a fully accessible Excel format;

- b. There must be an overall summary sheet with a financial roll-up of the information contained in the model with labour hours indicated at the 1-digit level;
- c. The CEM must be structured in accordance with DID I-006 ABS;
- d. The CEM must contain a table of contents describing model structure;
- e. The CEM must include the following detail for each cost element:
 - i. Estimated direct labour costs, including labour hours broken down by white/blue collar labour;
 - ii. Estimated direct material costs;
 - iii. Estimated Subcontractor labour hours and labour costs broken down by white/blue collar labour; and
 - iv. Estimated Subcontractor material costs.
- f. The CEM must include all costs contributing to the target cost;
- g. Base productivity data such as production norms other base inputs such as material quantities must be included within the CEM and/or supporting cost models. If base productivity data and inputs are not contained within the CEM, supporting cost models containing this information and associated calculations must be provided to Canada upon request;
- h. The CEM must indicate the base year of all estimates;
- i. The CEM must provide all costs in Canadian Dollars; and
- j. Any explanation of assumptions, variables and factors, as well as supporting information applied in the CEM, can reference the content in the CER for expanded details.

Cost Estimate Report (CER)

- a. The CER report format must be developed by the Contractor and agreed to by Canada;
- b. The report must include a description of the NSFRV design configuration which was used to develop the estimate;
- c. The report must include a description of how the base production norms were established, including assumptions and how they were applied to both labour and material estimates, and a description of the data source and its significance and relevance;
- d. The report must include a description and rationale for all adjustments made to the base production norms used to estimate costs;
- e. The report must describe the process in which the schedule is captured in the CEM and must include a description of the version of the Integrated Master Schedule that was used;
- f. The report must include a brief description of the intended scope and involvement of each subcontractor in the cost model;

- g. The report must include a description of the cost estimating approach and methodology that was applied in the CEM to arrive at the cost estimate results. This description must include:
 - i. The method for estimating labour hours;
 - ii. The method for estimating material costs;
 - iii. The applied labour rates used to develop the estimate, broken down by labour categories (shipyard/Subcontractor white/blue collar labour) and linked to the SWBS structure; and
 - iv. The basis of estimate, including the most significant assumptions used to develop the cost estimate.
- h. The report must include the identified major cost drivers of the CEM;
- i. The report must describe essential modeling characteristics including any inflation, escalation, and learning curves applied in the CEM; and
- j. The report must present all cumulative costs in Canadian dollars.

4. **DELIVERABLES:**

One (1) electronic copy of the CEM must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

One (1) electronic copy of the CER must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID M-005 Technical Data Management Plan and Technical Data Register

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Technical Data Management Plan (TDMP) and Technical Data Register (TDR).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The TDMP and TDR must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The TDMP must be provided in Microsoft Word format and as a searchable Portable Document Format (PDF) for all versions prior to the final version. The final version of the TDMP must be provided in a searchable PDF format.

The TDR must be provided in Microsoft Excel format. The final version of the TDR must be provided in searchable PDF format.

Requirements:

The Contractor must develop and deliver a TDMP which defines the process through which the Contractor will identify, validate, manage, release to Canada, address and track comments to technical and other data produced during Build Contract phase.

The TDMP must be maintained current throughout Build Contract phase, and accurately reflect the processes used by the Contractor.

At a minimum, the TDMP must define the Contractor's system for:

- a. Identifying and numbering technical data;
- b. Managing and controlling versions of data; and

c. Notifying Canada of version changes.

The Contractor must also develop and deliver a TDR which lists all technical and non-technical deliverables produced by the Contractor,

The TDR must be a comprehensive listing of all deliverables required by the DIDs and their status. It must be maintained current by the Contractor. The TDR must include, but is not limited to, the following:

- a. Title and identifying number of document;
- b. Type of document;
- c. Revision level of document;
- d. Revision date of document;
- e. Related DID(s);
- f. Record of OPI for each register item;
- g. Date submitted and date returned by Canada;
- h. Acceptance status of the document;
- i. Version and date of the register; and
- j. A change log which clearly identifies changes between versions of the register.

TDR information changes may be submitted informally, with exception to the following, which must be formally submitted to Canada:

- a. Additions of a new document(s);
- b. Removal of a document(s); and
- c. Changes to the title or identifying number of a document.

4. **DELIVERABLES:**

One (1) electronic copy of the TDMP must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

One (1) electronic copy of the TDR must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID M-006 Configuration and Change Management Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Configuration and Change Management Plan (CCMP).

2. ATTACHMENTS and APPLICABLE REFERENCES :

Attachments: N/A

References: ISO 10007 or ANSI/GEIA-649-A
PWGSC-TPSGC 1686
DID T-041 Construction Specification
DID Q-001 Quality Plan
DID M-001 Project Management Plan
DID M-005 Technical Data Management Plan and Technical Data Register
DID M-016 System Report Requirements
DID M-017 System Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The CCMP must be developed in the Contractor's format and agreed to by Canada.

The CCMP must be provided in Microsoft Word format and as a searchable Portable Document Format (PDF) for all versions prior to the final version. The final version of the CCMP must be provided as a searchable PDF.

The Contract Change Request form must be the Government of Canada form PWGSC-TPSGC 1686.

Requirements:

Configuration and Change Management Plan:

The CCMP must outline the process that the Contractor will use to define, manage and change Canada's Requirements, as manifest in Canada's Technical Baseline

of the Vessel through the Design Review, Complete Design Development and Production Design phases.

At a minimum, the CCMP must define the following:

- a. The Contractor's plan and process for tracking Canada's requirements;
- b. The process for updating the Technical Baseline of the Vessel such that it aligns with the Final Construction Specification;
- c. A Design Change Request process for seeking approval from Canada to change the approved Final Construction Specification;
- d. A process to track modifications resulting from a Design Change Request (as defined above) and to demonstrate the proposed modification will meet the applicable requirement(s); and
- e. A Physical Configuration Audit process for confirming the as-fitted configuration reflects the approved Technical Baseline (DID Q-001 Quality Management Plan) and drawings.

The CCMP must include the procedures for either the Contractor or Canada to initiate a Change Request. Proposed procedures must reflect that all Design Change Requests must be approved by Canada.

The CCMP must be consistent with industry standards, such as ISO 10007 or ANSI/GEIA-649-A.

The contractor must raise any proposed changes to Canada as they arise.

Change Form:

Change forms must include the following information:

- a. Change Proposal name;
- b. Number;
- c. Schedule impact;
- d. Proposed cost impact and cost breakdown;
- e. Scope of Work;
- f. Documentation Affected;
- g. Rationale for the proposed change;
- h. History of change (ex. date of request, proposed change, consultation with relevant sub-Contractors, etc.);
- i. Assumptions (blocks affected, personnel to conduct work, location of work, SOC); and
- j. Deliverables to be updated as result of change (ex. requirements, drawings, 3D model, reports, etc.)

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4. DELIVERABLES:

CCMP

One (1) electronic copy of the CCMP must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

The CCMP may be combined with the Technical Data Management Plan and Technical Data Register (DID M-005), and may be submitted as a sub-plan under the Project Management Plan (DID M-001).

Change Forms

One (1) electronic completed copy of the Change form must be provided to Canada for acceptance.

DID M-007 Meeting Agendas

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Meeting Agendas.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: Sample Technical Review Meeting Agenda
Sample Project Review Meeting Agenda

References: DID M-002 Integrated Master Schedule

3. PREPARATION INSTRUCTIONS:

Format:

The Meeting Agendas must be developed in the Contractor's format.

Agendas are to be provided in Microsoft Word format and as a searchable Portable Document Format (PDF).

Requirements:

The agenda will provide all meeting attendees with the structure and schedule of meetings, which will permit participants to better prepare for the subject meeting.

The agenda must notify participants of the topics to be discussed at the applicable meeting. The agenda must address, but not necessarily be limited to, the following:

- a. The scope, purpose and objective of the meeting;
- b. The time, date, location and expected meeting duration;
- c. Suggested Canada attendees;
- d. Contractor attendees;
- e. Status of items to be discussed at the meeting;
- f. New subject items to be introduced by the Contractor and/or Canada; and
- g. Special circumstances or requirements.

Unless otherwise specified, any technical data to be discussed at a scheduled meeting will be submitted with the agenda and the agenda is expected to include

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any items identified by the Technical Authority and the Contracting Authority for discussion.

4. **DELIVERABLES:**

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SAMPLE TECHNICAL REVIEW MEETING AGENDA

TECHNICAL MEETING #

Date:

Time:

Location:

Attendees:

1. OPENING REMARKS
2. ACCEPTANCE OF PREVIOUS MINUTES
3. REVIEW OF PREVIOUS ACTION ITEMS
4. TECHNICAL AUTHORITY – NEW ITEMS
5. CONTRACTOR – NEW ITEMS
6. DESIGN CHANGE STATUS (DCR LIST)
7. WEIGHT REPORT
8. OTHER ISSUES
9. TRANSPORT CANADA REGULATORY ISSUES
10. CLASSIFICATION SOCIETY ISSUES
11. WARRANTY ISSUES
12. ISSUES REGISTER
13. ADJOURNMENT AND DATE OF NEXT MEETING

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SAMPLE PROGRESS REVIEW/PROGRAM MILESTONE MEETING AGENDA

PROGRESS MEETING #

Date:

Time:

Location:

Attendees:

1. OPENING REMARKS
2. ACCEPTANCE OF PREVIOUS MINUTES
3. REVIEW OF PREVIOUS ACTION ITEMS
4. CONTRACTOR – NEW ISSUES
5. TECHNICAL AUTHORITY – NEW ITEMS
6. DIRECTOR, SHIPYARD OFFICE (CCG)– NEW ITEMS
7. PWGSC CONTRACTING AUTHORITY – NEW ITEMS
(Milestone Payment Status)
8. LONG LEAD ITEM CONTRACT PROGRESS
9. MANUFACTURING INFORMATION PROGRESS
10. HIGHLIGHTS OF PROGRESS REPORT BY CONTRACTOR
11. SCHEDULE UPDATES
12. RISK REGISTER
13. ISSUES REGISTER
14. DATE OF NEXT MEETING AND CLOSING REMARKS

DID M-008 Meeting Minutes

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Meeting Minutes.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The specific format of Meeting Minutes must be developed by the Contractor and agreed to by Canada.

The Meeting Minutes must be provided in Microsoft Word format and as a searchable Portable Document Format (PDF).

Requirements:

The Meeting Minutes must be prepared using an acceptable format within the constraints imposed herein. Meeting Minutes must include the following, at a minimum:

- a. Scope, purpose and objective of the meeting;
- b. Time, date and meeting duration;
- c. Government of Canada attendees;
- d. Contractor attendees;
- e. Status of items discussed at the meeting;
- f. Summary of discussion surrounding each item discussed at the meeting;
- g. Record of decisions made at the meeting;
- h. Identify action addressees;
- i. Target dates for the completion of action items;
- j. Suggested agenda items for the next meetings; and
- k. The date, time and location of the next meeting.

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The Meeting Minutes must be signed by the Contractor, Contracting Authority, and Technical Authority once comments are incorporated to the satisfaction of the Contracting Authority.

4. **DELIVERABLES:**

One (1) electronic copy of the Meeting Minutes must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID M-009 Class Review Register

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the development and presentation of the Class Review Register.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-005 Technical Data Management Plan and Technical Data Register
DID M-006 Configuration and Change Management Plan
DID M-011 Progress Reporting
DID M-021 3D Modelling Development Plan
DID Q-002 Inspection Plan
DID T-000 Compliance Matrix
DID T-078 Bill of Material

3. PREPARATION INSTRUCTIONS:

Format:

The Class Review Register must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Class Review Register must be provided in Microsoft suite formats or as a searchable Portable Document Format (PDF) for all versions prior to the final version. The final version of the Class Review Register must be provided in searchable PDF files.

Remarks:

The Contractor must have a Inspection Plan under DID Q-002 defining the process to manage Class Review in accordance with the selected Class Society and Canada's practices.

The Contractor must record the review requirements in a Class Review Register that must be updated as the design develops. The Class Review Register must include the following information, as a minimum:

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- a. Date the Approval was requested
- b. The Plan Comment Form (PCF)
- c. The Design Appraisal Document DAD Identification number
 - i. Impact of the Appraisal Status
 - ii. Plan to address the Appraisal Status
 - iii. Date the Appraisal Status was resolved or is projected to be resolved

As a minimum, the Class Review Register must contain the following:

- a. Lines Plan
- b. Midship Section
- c. Shell Expansion
- d. Transverse Sections
- e. Profile and Decks
- f. Deckhouse Structure
- g. Sea Chest Arrangement
- h. Secondary Crane Foundation
- i. Main Crane Foundation
- j. Z-drive Foundation
- k. Machinery Foundations
- l. SW Cooling System
- m. Exhaust Arrangement
- n. Fuel Oil System
- o. Lube Oil
- p. Elec Equipment Arrangement
- q. Electrical One Line Diagram
- r. Lighting Arrangement
- s. Integrated Communication System
- t. Sound Powered Telephone
- u. Fire Detection
- v. Electrical Propulsion Control
- w. Machinery Control and Monitoring Systems
- x. Vents and Soundings
- y. Heating, Ventilation, and Air Conditioning (HVAC) System
- z. Machinery Space Ventilation System
- aa. Fire System
- bb. Scuppers and Drains
- cc. Black and Grey Water
- dd. Bilge Ballast System
- ee. Domestic Fresh Water
- ff. Fresh Water Cooling System Diagram
- gg. Compressed Air
- hh. Fire Fighting Equipment Plan

- ii. Anchoring Mooring & Towing Arrangement
- jj. Lifesaving Equipment Plan
- kk. Oily Recovery-Oily Bilge System
- ll. Tank Capacity Plan
- mm. Doors and Hatches
- nn. Window Arrangement
- oo. Insulation Plan
- pp. Fire Zone Arrangement
- qq. Battery Arrangement / Energy Storage System (ESS)

In addition, any further identified documents by class shall be included in the register.

The Class Review Register must be updated as required and a current version must be referenced in the Progress Reporting DID M-011.

The Class Review Register may be incorporated into the Technical Data Management Plan and Technical Data Register DID M-005.

The deliverable(s) provided in accordance with T-078 Bills of Material and 3D Modelling Development Plan DID M-021 constitute the Technical Baseline. As such, alignment must be maintained between all relevant deliverables for each applicable DID as updates are made.

In addition, the deliverables for DID M-006 Configuration and Change Management Plan and DID T-000 Compliance Matrix must be aligned with the construction specification as updates are made.

The Class Review Register must then feed into the deliverable(s) generated in accordance DID Q-002 Inspection Plan as applicable.

4. **DELIVERABLES:**

One (1) electronic copy of the Class Review Register must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID M-011 Progress Reporting

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the the Progress Report (PR) as per the SOW.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001 Project Management Plan (PMP)
DID M-002 Integrated Master Schedule (IMS)
DID M-003 Risks and Issue Management Plan including the Risks
and Issues Register
DID M-013 Photographs and Models
DID Q-001 Quality Plan

3. PREPARATION INSTRUCTIONS:

Format:

The specific format of the PR must be developed by the Contractor and agreed to by Canada.

Requirements:

The PR must present an overview of the status of the project as described below and presentable to PSPC and CCG Senior Management.

Each PR must contain the following, at a minimum:

- a. An executive summary of status, including work planned vs. actual work completed;
- b. Key accomplishments and milestones to date;
- c. Major tasks in progress during the reporting period and reasons for any deviation;
- d. A forecast of tasks to be completed in the three months following the reporting period;
- e. An updated Risks and Issues Register (RIR) as per DID M-003 including:
 - i. Any new issues and risks identified, along with mitigation strategies and, where appropriate, contingency plans; and
 - ii. Any issues concerning cost, schedule, quality and/or scope.

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- f. Work progress based on progress estimates for key activities in the IMS and monitoring of resources expended. Significant deviations from planned schedule and resources will be highlighted and recommendations for corrective actions discussed;
- g. Forecast Estimate at Completion (EAC) review, analysis and discussion;
- h. Quality report based on the quality metrics defined in the Quality Plan DID Q-001;
- i. A summary of milestones / progress claim payments;
- j. Interim status reports for deliverables listed in the CDRL;
- k. Status of Intellectual Property (IP) agreements, International Traffic in Arms Regulations (ITAR), Technical Assistance Agreements (TAA), Controlled Technology Access and Transfer (CTAT) or other agreements; and
- l. Submit at least twenty five (25) colour digitally dated photographs of each vessel, visually demonstrating the progress of the Work, once construction has commenced, with each PR in accordance with Photograph and Models DID M-013.

The PR must also identify any work being performed under sub-contract.

4. DELIVERABLES:

One (1) electronic copy of the PR must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID M-013 Photographs and Models

1. PURPOSE of DID:

The purpose of this DID is to define the requirements for the Contractor for Vessel Photographs and Models.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-011 Progress Reporting

3. PREPARATION INSTRUCTIONS:

Photographs

Format:

All digital photographs must be in Joint Photographic Experts Group (JPEG) format. All photographs, as specified in the Statement of Work (SOW) must be delivered to Canada in digital format via email for the PRM. The final deliverable will need to be transferred to an authorized and portable storage unit supplied by the CCG project team.

a. Progress Photographs

Photographs must be at least 2240 x 1680 pixels (4 megapixels) and be in full colour. The photograph metadata must include the date photographs were taken and a short description of the image together with an indication of the location.

b. Display Photographs

Photographs must be at least 3264 x 2448 pixels (8 megapixels) and be in full colour. The photograph metadata must include the date photographs were taken and a short description of the image together with an indication of the location.

c. Interior and Exterior Spaces Photographs

Photographs must be at least 2240 x 1680 pixels (4 megapixels) and be in full colour. The photograph metadata must include the date photographs were taken and a short description of the image together with an indication of the location.

Requirements:

a. Progress Photographs

The photographs must include those areas of the Vessel that have changed the most or correspond to significant work for that particular month. Consideration for the above should be given when selecting the areas for photograph each month. Progress photographs are to be delivered as part of the Monthly Progress Report delivered in accordance with DID M-011 Progress Reporting.

For a minimum of ten (10) of the twenty-five (25) photographs, the Contractor must provide written permission to release for external communications.

b. Display Photographs

- i. Only the Canadian flag shall be on display on the mast;
- ii. Close-up of the Vessel at sea in motion;
- iii. Vessel moving on an angle towards the left-hand side of the photo;
- iv. Vessel moving on an angle towards the right-hand side of the photo;
- v. Side view profiles, both port and starboard ;
- vi. View dead ahead; and
- vii. View dead astern.

c. Interior and Exterior Spaces Photographs

The photographs must show comprehensive general views of the arrangement of machinery, equipment, appliances, furniture, fittings, instruments, outfit and equipment within the spaces or on the exterior decks.

Scale Models and Display Stands

Requirements:

Models

The Contractor must deliver two (2) scale models of the Vessel for display purposes.

- a. The model shall be:
 - i. Built to a 1:100 scale
 - ii. Securely mounted on a wood base on simulated keel blocks
 - iii. Enclosed in a safety glass case
- b. The model must consist of the entire as built Vessel's exterior from the keel and underwater appendages to the top of the highest antenna
- c. Materials used in the construction of the model shall be resistant to humid conditions
- d. The hull form shall conform accurately to the lines of the Vessel as constructed

- e. The hull shall be built up in lifts of Grade A select white pine or clear basswood, dowelled, and glued with water resistant glue
- f. Balsa wood shall not be used for any part of the model.
- g. Veneers of hardwood or sheet brass may be used for coamings and bulwarks
- h. Propellers shall be cast in bronze or first copper plated and then brass plated
- i. Hull openings shall be shown on the model as constructed on the Vessel
- j. The drop keel shall be shown in its stored position
- k. Fittings, appendages, and apparatus installed on the Vessel and visible from the exterior shall be reproduced and attached including, but not limited to:
 - i. Watertight doors
 - ii. Searchlights
 - iii. Floodlights
 - iv. Navigational equipment and lights
 - v. Flags
 - vi. Bell
 - vii. Ladders
 - viii. Rails
 - ix. Life preservers
 - x. Scuttles
 - xi. Tow reels
 - xii. Anchors
 - xiii. Boats (Fast Rescue Craft(s), Lifeboat(s), rafts) including their cradles/davits
 - xiv. Crane(s)
 - xv. Coring Deployment and Retrieval System (in its stored position)
- l. Equipment covers shall not be used
- m. Fittings and accessories may be made of metal or other suitable materials which will permanently hold shape and not deteriorate from oxidation or age
- n. Parts shall be treated to prevent action of humidity or corrosion
- o. White metal castings, lead, or lead-bearing compounds shall not be used
- p. Metal joints shall be silver-soldered
- q. Non-skid deck coverings, if any, shall be represented as installed
- r. Flags shall be fabric
- s. The hull and appendages shall be smooth and fair without blemishes, sap pockets or tool marks
- t. The application of thick paint which distorts the scale and results in an untidy appearance will not be accepted
- u. All parts of the model shall have a surface treatment representing the actual appearance of the Vessel
- v. Prior to spray painting with lacquer, a suitable undercoat shall be applied in sufficient thickness so that when rubbed down, it shall completely hide the grain of the wood
- w. Colors and markings shall match the "as-built" Vessel's colors and markings

- x. Two (2) engraved nameplates of satin finished brass shall be attached to the wood base, one in English and the second in French, containing the following:
 - i. Near-Shore Fisheries Research Vessel Date of Construction: [insert Date of Construction]
 - ii. Length Overall: [insert Length Overall]
 - iii. Breadth: [insert Breadth]
 - iv. Draft: [insert Draft]
 - v. Speed: [insert Speed]
 - vi. Complement: [insert Complement]
 - vii. Name and location of the model builder
- y. Protective crating shall be supplied to ship the model

Display Stand

Each model shall have its own display stand (Figure 1- Example of Display Stand)

- a. The display stand shall support the weight of the model
- b. The display stand shall be of rectangular shape
- c. There shall be a lip at the top of the display stand so that the model base cannot easily slide off the display stand

Note - The model and its base free floats on the display stand. Gravity and the above mentioned lip is the only means of securing the model to the base.

- d. The display stand, complete with feet, shall have the same color and matte finish as the model's base
- e. The wood shall be of the same type and quality as that of the model base
- f. The display stand shall be the same overall dimensions to accommodate the model base. Approximate dimensions are as follows:
 - 1. Height: 780 millimeter (mm) (including feet which are approximately 20 mm)
 - 2. Width: To be determined by the final width of the model base
 - 3. Length: To be determined by the final length of the model base
- g. The Crown reserves the rights to inspect each display stand during construction and after completion at the builder's plant prior to final Acceptance and shipment
- h. If upon inspection, any part of the work is found not to comply with these requirements, corrective action acceptable to the Crown shall be taken by the Contractor prior to shipment
- i. Protective crating is not required for the display stands but it is the responsibility of the builder to deliver the display stands in undamaged condition to Canada

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Figure 1- Example of Display Stand

An electronic draft of the nameplate shall be approved by Canada prior to production.

4. **DELIVERABLES:**

One (1) electronic copy of all the Display Photographs must be delivered to Canada in accordance with the NSFRV Build Contract CDRL at the time of Acceptance.

One (1) electronic copy of all the Interior and Exterior Spaces Photographs must be delivered to Canada in accordance with the NSFRV Build Contract CDRL at the time of Acceptance.

All models, stands, and protective crating must be delivered to Canada in accordance with the NSFRV Build Contract CDRL at the time of Acceptance.

DID M-016 System Report Requirements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the System Reports.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-005 Technical Data Management Plan and Technical Data Register

3. PREPARATION INSTRUCTIONS:

Format:

The System Reports must be submitted in searchable PDF format. The final version of each report must also be submitted in Microsoft Word format.

Requirements:

The System Reports must incorporate an introductory title page which includes the name and contact information of the author, a table of contents, and supporting text and graphs and formulas.

The System Reports must be numbered in accordance with the Contractors Technical Data Management Plan and Technical Data Register (M-005) and must include in the title the relevant system's SWBS number and document revision number for easy identification.

The System Reports must contain Intellectual Property markings in accordance with Contract requirements.

The System Reports must describe the development of the system's design from the initial CCG Contract Design provided.

The System Reports must include, but are not limited to, the following elements:

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- a. The history of the design decisions and systems changes to ensure readers understand how the system has matured during the Design Development phase;
- b. A list and description of all changes to the defined requirements for the system's design, procurement, build or operation;
- c. A description/list of all interdependent systems. Interdependent systems include those systems that interface with, and may be affected by changes to this system, and those systems that, if changed, will affect this system;
- d. A description of the system's control philosophy and operational modes;
- e. A list and description of the system's major equipment and the associated arrangement;
- f. A description of any recommended changes to the system resulting from the build strategy or production standards; and
- g. Recommendations pertaining to any risks and/or issues relevant to the system for inclusion in the NSFRV Project Risk Register.

4. DELIVERABLES:

One (1) electronic copy of the system report in each format must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID M-017 System Drawing Requirements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for System Drawings.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N. A.

References: Canadian Coast Guard (CCG) Marine Engineering AutoCAD Template
And User Guide (GCDocs # 25019221)
DID M-005 Technical Data Management Plan and Technical Data
Register

3. PREPARATION INSTRUCTIONS:

Format:

System Drawings must be arranged such that, when printed, they are sized in accordance with Canadian Coast Guard (CCG) Marine Engineering AutoCAD Template And User Guide*.

System Drawings must be drafted in accordance with Canadian Coast Guard (CCG) Marine Engineering AutoCAD Template And User Guide*.

The scale on each drawing will not be greater than 1:100. When this is impractical, a larger scale or a larger sheet size, including custom sizes, may be used.

Delivery of drawings is to be multi-sheet drawings contained within a single file as opposed to single file per sheet methodology.

The drawings must be delivered in .dwf, .dwg, and PDF format to constitute the full record.

The .dwf file must also be configured to be suitable for printing to the size of paper indicated in the drawing's title block without the need for scaling. The .dwf files must be monotone (black and white) unless special requirements necessitate the use of colours (e.g. safety plans).

Requirements:

The System Drawings must incorporate a title block in accordance with Canadian Coast Guard (CCG) Marine Engineering AutoCAD Template And User Guide*.

The System Drawings must be numbered and titled in accordance with the Contractor's Technical Data Management Plan and Technical Data Register (DID M-005) and also must include the relevant system's ABS number and the document revision number for easy identification.

The System Drawings must contain Intellectual Property markings in accordance with Contract requirements.

The System Drawings must include, but are not limited to:

Mechanical Drawing(s):

- a. The material schedule for pipes, valves and fittings;
- b. The required flow rate(s);
- c. The required temperature(s);
- d. The required pressure(s);
- e. All devices that measure, and control fluid flow, pressure, and level;
- f. All equipment (pumps, compressors, filters, valves, drains, etc.) must be clearly identified;
- g. P&ID of the system;
- h. Overlay of system equipment and distribution piping onto the GA; and
- i. Extraction of any system details referenced and contained in shipyard or industry standards (ex. deckhead/bulkhead penetrations, isolation arrangements).

Electrical/Electronic drawing(s):

- a. Cable types;
- b. All system components, including displays and switches;
- c. Network/system redundancy;
- d. Interface to other systems;
- e. Components antennas; and
- f. Power input, including voltage level and location of power panel.

The System Drawings must include data tables for major and significant equipment items within the system (e.g. pump(s), compressor(s), heat exchanger(s), etc.), including specialty valves, regulating, and control devices. The data tables must indicate:

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- a. The service capacity and pressure; and
- b. The make, model and characteristics.

The System Drawings must include symbols in accordance with a recognized standard (e.g. ANSI, ISO) and contain a list of symbols for the components within the diagram.

4. DELIVERABLES:

One (1) electronic copy of the system drawing in each format must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

* During the design and build stages, the Contractor could propose an alternate drawing standard for Canada's considerations.

DID M-018 System Calculation Requirements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for System Calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-005 Technical Data Management Plan and Technical Data Register

3. PREPARATION INSTRUCTIONS:

Format:

The System Calculation must be submitted in searchable PDF format and in the native unlocked format of the software used to perform the calculations.

Requirements:

The System Calculations must incorporate a title page at the front with the name and contact information of the author, a table of contents and include supporting texts, graphs, labels, data sheets, vendor furnished information and calculations.

The System Calculations must be numbered in accordance with the Contractors Technical Data Management Plan and Technical Data Register (DID M-005) and include the relevant system's SWBS and document revision numbers for easy identification.

The System Calculations must contain Intellectual Property markings in accordance with Contract requirements.

The System Calculations must encompass the entirety of the supporting calculations used to design, size, select and assess the system and its component equipment, wiring, piping, control, interface and supporting structure.

The System Calculations must clarify to the reader how values were derived and detail the following:

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- a. All formulas used to calculate the values presented;
- b. All inputs (i.e. supporting information) used, along with the associated data sheets and vendor furnished information from which they were extracted;
- c. Any software used to perform the calculations;
- d. Any software inputs or input files used to perform the calculations;
- e. Any spreadsheet or software output files utilized must be annotated and explained;
- f. Any spreadsheet or software output files utilized must be unlocked; and
- g. Any assumptions and/or standards used to calculate the values present in the report.

4. DELIVERABLES:

One (1) electronic copy of the System Calculation Requirements in each format must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID M-019 Arrangement Drawing Requirements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for Arrangement Drawings.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: Canadian Coast Guard (CCG) Marine Engineering AutoCAD Template
And User Guide (GCDocs # 25019221)
DID M-005 Technical Data Management Plan and Technical Data
Register

3. PREPARATION INSTRUCTIONS:

Format:

Arrangement Drawings must be arranged such that their printed versions are sized in accordance with Canadian Coast Guard (CCG) Marine Engineering AutoCAD Template And User Guide*.

Arrangement Drawings must be drafted in accordance with Canadian Coast Guard (CCG) Marine Engineering AutoCAD Template And User Guide*.

Arrangement Drawings can be furnished in a large format or standard office paper sizes. The preferred size of large format drawings is A1 or A1.0.

Standard offices size paper is letter, legal, or tabloid size. A3 and A4 sizes, and their variants, are not acceptable.

The scale on each drawing will not be greater than 1:100. When this is impractical, a larger scale or a larger sheet size, including custom sizes, may be used.

Delivery of drawings is to be multi-sheet drawings contained within a single file as opposed to single file per sheet methodology.

The drawings must be delivered in *.dwf, .dwg, and PDF format to constitute the full record.

As such, the *.dwf file must be configured to be suitable for printing to the size paper indicated in the drawing's title block without the need for scaling. The *.dwf files must be monotone (black and white) unless special requirements necessitate the use of colours (e.g. safety plans).

Requirements:

Arrangement Drawings must incorporate a title block on the first page.

Arrangement Drawings must be numbered in accordance with the Contractors Technical Data Management Plan and Technical Data Register (M-005) and must include the relevant system's ABS and document revision number for easy identification.

The Arrangement Drawings must contain Intellectual Property markings in accordance with Contract requirements.

Arrangement Drawings must develop and maintain the plan, elevation, and sections views.

Arrangement Drawings must show:

- a. The compartment boundaries;
- b. Doors;
- c. Hatches;
- d. Manholes;
- e. Windows and Portlights;
- f. Liners and joiner bulkheads;
- g. Deckheads;
- h. HVAC - FCUs and duct space reservations;
- i. Electrical including Fixtures, Outlets and Lighting;
- j. LAN Drop;
- k. Phones;
- l. Fire Detection and Suppression;
- m. Space reservation for piping and valve manifolds;
- n. Space reservation for HVAC and Cable routing indicated;
- o. Space reservations for equipment access, maintenance and removal indicated; and
- p. A compartment outfit list with all items shown on the drawing showing the item name and quantity. The compartment outfit list must include, but is not limited to:
 - i. All furniture; and

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ii. All equipment.

Arrangement Drawings must include symbols in accordance with a recognized standard (e.g. ANSI, ISO) and contain a list of symbols for the components within the diagram.

4. DELIVERABLES:

One (1) electronic copy of the system arrangement drawing in each format must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

* During the design and build stages, the Contractor could propose an alternate drawing standard for Canada's considerations.

DID M-020 Engineering Maturity Management Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Engineering Maturity Management Plan (EMMP).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The EMMP must be provided in the Contractor's format.

Requirements:

The NSFRV EMMP must outline the specific maturity requirements to be achieved during each contract phase.

The Contractor will work in collaboration with Canada and agree upon the expected levels of maturity for each contract phase prior to the Contractors submission.

The plan may be based on the Contractor's generic Engineering Maturity Management Plan, but must be customized to address the unique aspects and requirements of the NSFRV Project including, but not limited to, the design maturity at the beginning of the NSFRV Build Contract work, and the required maturity at the end of the Work, and all interim phases.

4. DELIVERABLES:

One (1) electronic copy of the EMMP must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID M-021 3D Modelling Development Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the 3D Modelling Development Plan.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-041 Construction Specification
DID T-078 Bill of Material (BOM)
DID T-000 Compliance Matrix
DID M-006 Configuration and Change Management Plan

3. PREPARATION INSTRUCTIONS:

Format:

The 3D Modelling Development Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The 3D Modelling Development Plan must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version must be provided in both Microsoft Word format and PDF.

Requirements:

The Contractor must provide to Canada a plan identifying its approach to 3D modelling. The plan must identify at what phase of work the Contractor intends to begin using and providing 3D models to Canada.

As part of the 3D Modelling Plan, the Contractor must provide a review and analysis incorporating 3D modelling into its own internal processes.

The Contractor's 3D modelling plan must include a description of the proposed methods of managing model data, and outline how the Contractor will manage the change inherent in an iterative design process.

The plan must include a description of how the Contractor plans to develop and maintain a Bill Of Material (BOM) or Advanced BOM in model environment.

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4. DELIVERABLES:

One (1) electronic copy of the 3D Modelling Development Plan must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID Q-001 Quality Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Quality Plan.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: ISO 10005: 2018 Quality Management – Guidelines for Quality Plans
DID M-001 Project Management Plan (PMP)

3. PREPARATION INSTRUCTIONS:

Format:

The Quality Plan must be prepared in the Contractor's format and accepted by Canada.

The Quality Plan must be provided in Microsoft Suite formats and as a searchable PDF for all versions prior to the final version. The final version of the Quality Plan must be provided in a PDF file.

Requirements:

The Quality Plan must be consistent with and subordinate to the Project Management Plan and prepared in accordance with the current version of ISO 10005: 2018 Quality Management - Guidelines for Quality Plans.

The Quality Plan must specify how the required quality control and assurance activities will be performed, including the quality assurance of Subcontractors and Suppliers. The Quality Plan must include and/or reference all of the processes, procedures, standard practices, work instructions, tools and techniques, and timing records of quality activities implemented in the Quality Management activities.

The Quality Plan must clearly identify roles and responsibilities for Quality Control (QC) and Quality Assurance (QA) activities, particularly as it relates to the transition between Production activities to Acceptance activities (ex. Tests and Trials).

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4. **DELIVERABLES:**

One (1) electronic copy of the Quality Plan must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID Q-002 Inspection Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Inspection Plan.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-009 Class Review Register

3. PREPARATION INSTRUCTIONS:

Format:

The Inspection Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Inspection Plan must be provided in Microsoft suite formats and as a searchable PDF for all versions prior to the final version. The final version of the Inspection Plan must be provided in PDF files.

Requirements:

The Inspection Plan must be developed in accordance with Classification Society requirements, Transport Canada Marine Safety requirements, and the inspection requirements of Canada's Inspection Authority.

The plan must detail all inspections which must be witnessed by a Regulatory Body, Canada and/or the Classification Society surveyor.

The Inspection Plan must include, at a minimum:

- a. Inspection schedule and a description of how this schedule will be integrated into the build schedule and work packages;
- b. Inspection type and description including methodology;
- c. Pass or fail criteria;
- d. Non-destructive testing program;
- e. A description of how the inspection documentation will be controlled outlining documentation flow and numbering systems;

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- f. Cross reference for each inspection to the requirements in the Ship's Specification being demonstrated; and
- g. Witnessing requirements.

4. **DELIVERABLES:**

One (1) electronic copy of the Inspection Plan must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID Q-003 Tests and Trials Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Tests and Trials Plan.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-002 Integrated Master Schedule (IMS)

3. PREPARATION INSTRUCTIONS:

Format:

The Tests and Trials Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Tests and Trials Plan must be provided as a Microsoft suite file and as a searchable PDF for all versions prior to the final version. The final version of the Tests and Trials Plan must be provided in PDF.

Requirements:

The Tests and Trials Plan must demonstrate how the Contractor will organize, conduct and record the results of all tests and trials.

The Tests and Trials Plan must be developed in accordance with Classification Society rules, Transport Canada Marine Safety (TCMS) requirements, and Canada's test and trial requirements. The Tests and Trials Plan must detail all test and trials that must be witnessed by Canada, the Regulatory Body, the Classification Society surveyor and/or the Technical Authority in order that all specified certifications and notations can be obtained.

The Tests and Trials schedule must be captured in the Master Plan and Schedule provided in accordance with DID M-002 Integrated Master Schedule (IMS).

The Tests and Trials Plan must contain the following types of Tests and Trials:

- a. Factory Acceptance Tests (FATs).

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Overall, the cumulative Tests and Trials Plan must include high level information on the following, at a minimum:

- a. A list of all Tests and Trials to be completed including the high level objective of each Test and Trial;
- b. A detailed description of all Test and Trial stages and which Tests and Trials will be conducted in those stages, outlining the logic behind the sequencing; and
- c. A description of how the Test and Trial documentation will be controlled, outlining documentation flow and numbering system.

4. DELIVERABLES:

One (1) electronic copy of the Tests and Trials Plan must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID Q-004 Tests and Trials Reports

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Tests and Trials Reports.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID Q-003 Tests and Trials Plan
DID Q-005 Tests and Trials Agenda

3. PREPARATION INSTRUCTIONS:

Format:

The Tests and Trials Reports must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Tests and Trials Reports must be provided as a Microsoft suite file and as a searchable PDF for all versions prior to the final version. The final version of the Tests and Trials Reports must be provided in PDF.

Requirements:

Each Tests and Trials Report must be clearly aligned with the Tests and Trials Plan provided in accordance with DID Q-003. Where the plan indicates the high level rationale and purpose of each specific Test or Trial, the Reports must clearly spell out whether the objective of the plan has been met and whether the applicable requirements can now be said to be met.

Each Tests and Trials Report must be clearly aligned with the related Tests and Trials Agenda provided in accordance with DID Q-005. Where the Agenda spells out the process to confirm or validate that a requirement has been met, the Report must clearly show the agenda was executed upon and whether the Test or Trial was a pass or fail.

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The tests and trials agenda created in accordance with DID Q-005 may act as the basis of the tests and trials report so long as all criteria below are met in the final agenda or report.

Each Tests and Trials Report must, at a minimum:

- a. Provide a purpose for the inspection, test, and/or trial, along with the specification requirement or reference being addressed for validation;
- b. Identify any changes to the test or trial conditions or procedures from those described in the Test and Trials Agenda, including any factors which could have influenced the conduct or results of the inspection, test or trial;
- c. Provide a scanned copy of the original Record Sheet, which was appended to the Test and Trials Agenda and used during the particular inspection, test, and / or trial;
- d. Provide a summary of the Test or Trial outcome (pass or fail); and
- e. Identify by name and position, all personnel involved in the conduct, supervision and witnessing of the test or trial.

4. **DELIVERABLES:**

One (1) electronic copy of the Tests and Trials Reports must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID Q-005 Tests and Trials Agenda

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Tests and Trials Agenda.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: Q-003 Tests and Trials Plan
Q-004 Tests and Trials Reports

3. PREPARATION INSTRUCTIONS:

Format:

The Tests and Trials Agenda must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Tests and Trials Agenda must be provided as a Microsoft suite file and as a searchable PDF for all versions prior to the final version. The final version of the Tests and Trials Agendas must be provided in PDF.

Requirements:

Each Tests and Trials Agenda should be clearly aligned with the Tests and Trials Plan provided in accordance with DID Q-003. Where the plan indicates the high level rationale and purpose of each specific Tests or Trials, the Agendas should clearly spell out the specifics for executing each Test or Trial.

The results of each Test or Trial, upon being executed, must be captured in Tests and Trials Report(s) to be delivered in accordance with DID Q-004.

Each Tests and Trials Agenda must:

- a. Provide a purpose for the Test or Trial, along with the relevant specification requirement or reference it is meant to address;

- b. Provide any prerequisites which must be met prior to conducting the Test or Trial (i.e. set to work procedures, inspections, etc.);
- c. Outline the conditions or parameters under which the Test or Trial is to be conducted, including any safety precautions peculiar to that particular Test or Trial;
- d. Give details of applicable statutory regulatory and/or any Class requirements to be met by the Test or Trial, plus the requirement for witnesses such as Classification Society, Inspection Authority, Technical Authority, OEM, Regulatory Body, etc.;
- e. A list of all instrumentation and data collection equipment requiring calibration records;
- f. Give a detailed description of the steps required to conduct the Test or Trial;
- g. Indicate the specific required personnel from both the Contractor and Canada; and
- h. Provide a Record Sheet, which must include check-off lists for readings and observations required during the Test or Trial and space for recording the readings, observations, and data that are to be collected during the Test or Trial. At a minimum, the Record Sheet will also provide space for signature from a builder's representative, Classification Society, Inspection Authority and Technical Authority. The record sheet must be appended to the Test and Trials Agenda prior to the commencement of the Test or Trial.

4. **DELIVERABLES:**

One (1) electronic copy each Tests and Trials Agenda must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID Q-006 Acceptance Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Acceptance Plan.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-002 Integrated Master Schedule
DID M-009 Class Review Register
DID Q-002 Inspection Plan
DID Q-003 Tests and Trials Plan

3. PREPARATION INSTRUCTIONS:

Format:

The Acceptance Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Acceptance Plan must be provided in Microsoft suite formats and as a searchable PDF for all versions prior to the final version. The final version of the Acceptance Plan must be provided in PDF files.

Requirements:

The Acceptance Plan must reflect the Contractor's cumulative plan for overall vessel acceptance.

In general, progressive acceptance must take a structured approach, commencing with design reviews demonstrating that the equipment, systems and Vessel as designed meet the requirements. Design reviews will be followed by physical audits or inspections demonstrating that the equipment, systems and Vessel have been constructed in accordance with the design. Tests, trials and demonstrations will then follow, demonstrating that the equipment, systems and Vessel as an integrated system function correctly as designed and as intended by the OEM or integrator.

Specifically, the Contractor's Acceptance Plan must demonstrate interim and final compliance with the requirements in a progressive methodology, as follows:

- a. Design: Development Test and Evaluation;
- b. FAT/Environmental: Factory Acceptance Trial and Environmental Trials (if not currently qualified);
- c. Tests and Trials: Shore Based Trials, Harbour Acceptance Trials System Integration, Sea Acceptance Trials, Customer Trials;
- d. QC Inspection and Compartment Inspections; and
- e. Program Acceptance Requirements.

The Acceptance Plan must show the clear progression between various acceptance activities. Specifically, it must identify how the Contractor will transition from:

- a. Design review (ensuring requirements are met);
- b. Verification that equipment/system is installed according to the drawing;
- c. Inspections;
- d. Functional tests/trials; and
- e. Delivery.

The Acceptance Plan must demonstrate how the Contractor intends to ensure all necessary certificates (Regulatory and Class) are received upon delivery. This must be linked directly to the necessary certificates as defined in M-009 Class Review Register.

The Acceptance Plan must demonstrate how the Contractor intends to ensure the Vessel Condition upon Delivery.

The Acceptance Plan must capture all of the activities defined in the Compliance Matrix and correlate them to demonstrating progressive compliance with each individual requirement.

The Contractor may determine whether subordinate plan(s) are required. Regardless of whether subordinate plan(s) exists, the Acceptance Plan must provide sufficient detail so that the Contractor's strategy is clear.

The Acceptance Plan must be aligned with the Inspection Plan delivered in accordance with DID Q-002, the Tests and Trials Plan delivered in accordance with DID Q-003, and the Integrated Master Schedule delivered in accordance with DID M-002.

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As part of the Acceptance Plan, the Contractor must create an Acceptance Checklist indicating the list of items required to ensure all Acceptance criteria are met prior to delivery. The Acceptance Criteria must demonstrate how the Contractor will demonstrate, by the time of Final Ship Acceptance, that the vessel is safe to operate, all requirements are met, all regulatory elements are addressed, the vessel is mission ready, and that the vessel is in new condition.

4. DELIVERABLES:

One (1) electronic copy of the Acceptance Plan must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID Q-007 Defects and Deficiencies Register

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Defects and Deficiencies Register (DDR).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID Q-001 Quality Plan
Appendix F-2 Ship Acceptance Form (PWGSC 1105)

3. PREPARATION INSTRUCTIONS:

Format:

The DDR must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The DDR must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the Quality Plan must be provided in PDF files.

Requirements:

The Contractor must develop and maintain a DDR to show all deficiencies and their status.

The DDR will be applied to each defect/deficiency as it arises and must be updated as new information becomes available.

The DDR must include, at a minimum:

- a. Name of the defect/deficiency;
- b. Date the defect/deficiency was identified;
- c. How the defect/deficiency was identified (i.e. Inspection, Test X, etc.);
- d. Related documents. For example, the source document for the defect/deficiency was first identified (i.e. Test Report for Text X);
- e. Proposed methodology to address defect/deficiency;
- f. Severity;
- g. Priority;

- h. Whether the defect/deficiency affects compliance with a particular requirement in Construction Specification;
- i. Whether the defect/deficiency affects safety;
- j. Whether the defect/deficiency affects ability to meet regulatory certification;
- k. Whether the defect/deficiency affects mission readiness; and
- l. Identification of the gate the defect/deficiency must be addressed by in order to advance the Work (ex. A defect noted during Builder's Dock Trials that must be rectified prior to advancing to Builder's Sea Trials).

The DDR must inform progress reporting and will be a standing agenda item during the Progress Review Meetings (PRMs) and Technical Review Meetings (TRMs).

The Contractor's DDR must be available to Canada in real-time.

Any remaining defects/deficiencies at the time of final Ship Acceptance must be captured in the PWGSC 1105 form.

4. DELIVERABLES:

One (1) electronic copy of the DDR must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID I-001 Class Manual

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements of the Class Manual.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID I-002 Vessel, System, and Equipment Manuals
DID I-009 Initial Maintenance Task List
DID I-010 Initial Maintenance Task Analysis
DID I-011 Maintenance Plan
DID I-015 Training Materials and Course Delivery

3. PREPARATION INSTRUCTIONS:

Format:

The Class Manual must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Class Manual must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the Class Manual must be provided in PDF files.

Requirements:

The Class Manual provides general information on construction, performance, and high level system overviews. The audience is for all applicable CCG personnel. Specific in depth technical information regarding systems and their operations, maintenance, and certification shall be detailed in the other publications to be delivered in accordance with DID I-002 and the suite of DIDs covering Maintenance I-009, I-010 and I-011.

For the purposes of **this DID only**, 'Class' does not refer to the Classification Society, but to the Vessels as a class of vessels.

The Class Manual must be provided in English and in French.
The Class Manual must describe the vessel, the general layout of each deck, the vessel's design and performance characteristics and cover general system

information. Chapters must have the same names and be in the same order as the training modules of the Crew Training Courses delivered in accordance with I-015 Training Materials and Course Delivery and must provide details regarding each of the major systems listed.

Introduction:

This section introduction must contain outboard profile and plan views for the vessel with a legend indicating all of the compartments on the vessel to be described in this section.

Design:

Note if the design was based on another design. Note the name of the designer for the particular class and the year(s) the design was developed.

Vessel Builder/Manufacturer:

Note the shipyard that built the vessel and the engineering firm they worked with for production engineering.

Principal Particulars:

Note the general features that describe the vessel's characteristics from a structural perspective (i.e. dimensions, gross tonnage, hull form, buoyancy characteristics, draft etc.).

Complement and Accommodations:

Number of crew plus additional complement and description of accommodations.

General Performance Data:

- Environmental Limits based on design criteria, including ice condition data
- Fuel consumption and range
- Station keeping
- Seakeeping (General – Not Trim and Stability Booklet)
- Acceleration
- Speed/safe speed
- Tactical Diameter
- Deceleration
- Crash stops
- Propeller characteristics
- Endurance

Program Information:

This section must include all information regarding the raison d'être for the ship based on the mission profiles for the vessel i.e. based on the Science missions e.g.: Science compartments, lab arrangements capabilities, cranes and winches limitations, configuration and functionality of all systems involved for the science missions

System / Equipment Information:

To include a basic description and a schematic/drawing or pictures for specific pieces of equipment.

Cross-references to the Vessel, System and Equipment manuals and OEM manuals must call out specific references to sections, chapters and/or appendices, in addition to the manual's title, version, reference number, and/or date of publication.

The deliverables in response I-002 Vessel, System and Equipment Manuals will then include more detail for ease of use for operators and maintainers.

- General Information and ship layout including lab arrangements, etc.
- Key safety features (including water tight doors, escape routes, fire detection and fire suppression systems, fire main, hoses, firefighting lockers, smoke hoods and air packs etc.)
- Lifesaving equipment
- Stability (general statement details will be in the Trim and Stability Booklet)
- Tank capacity tables
- Ballast system (including filling, transfer and discharge etc.)
- Main propulsion system propulsion and machinery control system
- Ship Control Monitoring System (SCMS)
- Electrical generation and distribution system
- Energy Storage System (ESS), fuel storage and transfer system (including filling, lubrication oil filling, transfer and storage system, etc.)
- Compressed air system
- Fire fighting system
- Bilge suction system
- Navigation systems
- Bridge control systems (including oily water separator and storage, tank filling, transfer and discharge etc.)
- Internal communications system
- External communications system
- Heating, Ventilation & Air Conditioning (HVAC) system

- Fresh water system (including reverse osmosis system, waste heat evaporators etc.)
- Oily water system
- Science equipment including science electronics equipment
- Domestic systems and equipment, including sanitary system (such as black and grey water systems)
- Auxiliary equipment and control (including refrigeration and freezer systems, etc.)
- Hull, program container services and working deck equipment (including anchor windlass, cranes, davits, rigid hull inflatable boat davit)
- Machine tools and industrial shop equipment

Layout:

The layout of each page must conserve space without lessening usability or clarity of material. Blank pages and spaces must be avoided whenever possible and if applicable, the statement “This page is intentionally left blank” will be used. Leading spacing must be used to ensure legibility and conservation of space. Double spaced text is not acceptable. Slight variations are permitted to avoid layout practices that would result in the following:

- The first line of the paragraph being at the bottom of the page
- The last line of a paragraph being at the top of a new page
- A side-head falling on the last line of a page
- A warning, cautions, notes being divided so that the first lines appear on one page and the remaining lines on another.

Images, graphics, figures, schematics, drawings, etc. must be embedded at a suitable resolution and must not degrade when magnified.

4. DELIVERABLES:

One (1) deliverable submission of the Class Manual – English must be delivered in accordance with the NSFRV Build Contract CDRL.

One (1) deliverable submission of the Class Manual – French must be delivered in accordance with the NSFRV Build Contract CDRL

DID I-002 Vessel, System, and Equipment Manuals

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Vessel, System, and Equipment Manuals.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: I-001 Class Manual
I-003 Original Equipment Manufacturer (OEM) Manuals and
Technical Publications
I-009 Initial Maintenance Task List
I-010 Maintenance Task Analysis
I-011 Maintenance Plan
I-014 Training Recommendations and Analysis
I-015 Training Materials and Course Delivery

3. PREPARATION INSTRUCTIONS:

Format:

The Vessel, System and Equipment Technical Manuals must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Vessel, System and Equipment Technical Manuals must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the System Technical Publications must be provided in PDF files.

Requirements:

All Manuals supplied must cross reference OEM manuals to the level of detail required to allow for an easy search of the manual.

The audience includes all CCG / Department of Fisheries and Oceans (DFO) personnel who operate and maintain the vessel, vessel systems and equipment. Specific maintenance information for systems and equipment will be delivered via the suite of DIDs covering maintenance in DIDs I-009, I-010 and I-011.

The Vessel, System and Equipment Manuals must be provided in English and in French.

Given that OEM manuals for pieces of equipment are more readily available, focus must be on the full system and all integrated system functionality, configuration, operations and technical details as opposed to simply the equipment level. Existing OEM manuals must be provided to Canada in accordance in accordance with DID I-003 OEM Manuals and Technical Publications.

Where OEM manuals are referenced in the System Technical Publications deliverable(s), cross-references must call out specific references to sections, chapters and/or appendices, in addition to the manual's title, version, reference number, and/or date of publication.

The Vessel, System and Equipment Technical Manuals must contain the following, at a minimum:

- Information describing all configuration, functionality, technical data and operations
- Initialization / start up sequences and options
- Inputs that are required while the system is in use, and that may affect the system's interface with the user
- Termination / shut down sequences and options
- Restart conditions and sequences
- Expected outputs, including errors and error messages
- Drawings and diagrams beneficial to the operations, the functionality and configuration
- Notes, Hazards, Cautions, and Warnings
- Diagnostic routines, procedures, and tools
- A cross reference to all maintenance procedures and task lists as per DIDs I-009, I-010 and I-011
- System design documentation (i.e. theory of operation, system configuration and specification)
- Built-In-Test (BIT) capabilities, stating fault detection capabilities and faults
- Special adjustments, calibrations required and required intervals
- Technical application notes
- An Illustrated Parts Breakdown
- Supplier equipment nomenclature
- Supplier part numbers of equipment in use

While some information may be covered in DID I-001 Class Manual, the Vessel, System and Equipment Technical Publications must also include any general

information that aids in understanding the system and equipment operation, and must define any terms and acronyms used.

Within each manual, a combination of schematics/drawings and pictures can be used, however emphasis must be placed on schematics/drawings rather than pictures. These schematics/drawings must be labelled appropriately to identify the system components being addressed in each section or subsection.

Items to be addressed must include:

- Index of all manuals
- Ballast System Manual
- Weight Control Manual
- Main Propulsion System Propulsion and Machinery Control System Manual
- Ship Control Monitoring System Manual
- Electrical Generation and Distribution System Manual
- Energy Storage System Manual
- Fuel Storage and Transfer System Manual
- Compressed Air System Manual
- Fire Fighting System Manual
- Bilge Suction System Manual
- Navigation and Integrated Bridge Systems Manual
- Bridge control systems Manual
- Internal Communications System Manual
- External Communications System Manual
- Heating, Ventilation & Air Conditioning System Manual
- Fresh Water System Manual
- Manuals for Science equipment including science electronics
- Domestic systems and equipment, including sanitary system manual
- Auxiliary equipment and control Manual
- Working Deck Equipment Manual (including science equipment, anchor windlass, cranes, davits, rigid hull inflatable boat davit)
- Environmental Protection features manual
- Damage Control Information Book
- Manual of all Workflows

Program Manual

This section must include all information needed to specify in full detail the functionality, configuration and operation of all associated equipment required to achieve Mission Profiles.

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The Trim and Stability Booklet is not included here as it is under addressed in DID I-004 Trim and Stability Booklet.

The Manuals / Plans anticipated to be delivered also include the following:

- Manuals and Plans
- Intact Stability Manual
- Damage Stability Manual
- Oil record Book
- Ship Oil Pollution Emergency Plan (SOEPEP)
- Shipboard Marine Pollution Emergency Plan (SMPEP)
- Cargo Securing Manual
- Dangerous Goods Loading Manual
- Ballast Water Management Plan
- Garbage Management Plan
- Ship Energy Efficiency Management Plan (SEEMP)
- Loading Instrument
- Lifting Appliance Manual/Tackle Register
- Life Saving Maintenance / Training Manual
- Winterization Manual
- Fire Zone Plan
- Life Saving Plan
- Fire Control Plan
- Hazardous Zone Plan

Document Layout

The layout of each document is to be as similar as possible and each page must conserve space without diminishing the usability or clarity of the material. Blank pages and spaces must be avoided whenever possible, though if required, the statement "This page is intentionally left blank" will be used. Leading spacing must be used to ensure legibility and conserve space. Double spaced text is not acceptable. Slight variations are permitted to avoid layout practices that would result in the following:

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Images, graphics, figures, schematics, drawings, etc. must be embedded at a suitable resolution and must not degrade when magnified.

4. DELIVERABLES:

One (1) deliverable submission of the Vessel, System, and Equipment Manuals – English must be delivered in accordance with the NSFRV Build Contract CDRL.

One (1) deliverable submission of the Vessel, System, and Equipment Manuals – French must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-003 Original Equipment Manufacturer Manuals and Technical Publications

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Original Equipment Manufacturer (OEM) Manuals and Technical Publications.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: I-003 OEM Manuals and Technical Publications & I-019 As-Fitted Drawings Technical Data Deliverables Metadata Index

References: DID I-002 Vessel, System and Equipment Manuals

3. PREPARATION INSTRUCTIONS:

Format:

Any existing OEM manuals and technical publications must be presented unaltered.

Requirements:

All OEM manuals and technical publications for specific equipment and systems must be provided in English and in French. Where OEM manuals and technical publications are not available in both official languages, the Contractor must identify those in I-003 OEM Manuals and Technical Publications & I-019 As-Fitted Drawings Technical Data Deliverables Metadata Index.

The Contractor must ensure that final versions are provided, and ensure that manuals and technical publications are not in draft format upon submission.

An index must be provided to list the complete list of OEM Manual and Technical Publications provided in accordance with the I-003 OEM Manuals and Technical Publications & I-019 As-Fitted Drawings Technical Data Deliverables Metadata Index. Metadata must be populated in a consistent approach (i.e. Revision Date: YYYY-MM-DD vice MM-DD-YY). Format and naming instructions will be provided in the I-003 OEM Manuals and Technical Publications & I-019 As-Fitted Drawings Technical Data Deliverables Metadata Index.

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4. **DELIVERABLES:**

One (1) deliverable submission must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-004 Trim and Stability Booklet

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Trim and Stability Booklet.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: Trim and Stability Book Production for Canadian Coast Guard (CCG) Vessels V5

3. PREPARATION INSTRUCTIONS:

Format:

The Trim and Stability Booklet must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Trim and Stability Booklet must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the Trim and Stability Booklet must be provided in PDF files.

Requirements:

The Trim and Stability Booklet must include applicable inclining and Light Ship Weight survey results.

The Stability Software selected to calculate trim and stability must be General Hydro Statics (GHS) program created by Creative Systems, Inc. The Contractor must use the latest version of GHS available at the date of Contract Award for Trim and Stability Booklet production.

The Trim and Stability Booklet must be prepared and laid out in accordance with Trim and Stability Book Production for CCG Vessels V5 and contain the information required by that document.

The Trim and Stability Booklet must be provided in English and in French.

In addition to the Booklet, the Contractor must submit the following:

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- Source files for any tables and graphics embedded in the Booklet must also be included (e.g. Excel tables, photographs etc.). In addition, these electronic files must include all stability program files required to generate the information within the Trim and Stability Booklet, including all hull geometry, tank and compartment definition, library, macro, loading, intact stability and damaged stability run files.
- Load Line calculation report in both Adobe PDF and Microsoft Word formats. Source files for any tables and graphics embedded in the Word file must also be included (e.g. Excel tables, photographs etc.). In addition, a report must include a marked up drawing #xxxxx Lines Plan showing the actual locations of all measurements used in the load line calculation.
- Instructions on how to use and maintain/update the Onboard Stability Software (GLM or similar) as per IS Code - International Code on Intact Stability, 2008, Part B Ch 4.

4. DELIVERABLES:

One (1) deliverable submission of the Trim and Stability Booklet – English must be delivered in accordance with the NSFRV Build Contract CDRL.

One (1) deliverable submission of the Trim and Stability Booklet – French must be delivered in accordance with the NSFRV Build Contract CDRL

DID I-005 Master Equipment List

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Master Equipment List (MEL).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References:

DID I-006 Asset Breakdown Structure (ABS)
DID I-007 Recommend Spare Parts and Materiel List (RSPML)
DID I-008 Packaging Handling Storage and Transportability (PHST)
Requirements List
DID T-078 Bill of Materials (BoM)
Reference A: MEL Additional Instructions and Guidance
Canadian Coast Guard (CCG) Fleet Safety Manual (most recent
version)

3. PREPARATION INSTRUCTIONS:

Format:

The MEL must be prepared in the Contractor's format. The final format must be reviewed and accepted by Canada.

The MEL must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the MEL must be provided in PDF files.

Requirements:

The MEL is a listing of equipment and components, based on the Construction Specification (requirements), General Arrangements, and key system diagrams that impact design. The MEL is a subset of the BoM developed under DID T-078.

The MEL will be used to develop a list of equipment and components used as unique items in the CCG Maintenance Management System for the purpose of tracking maintenance data. The MEL must specify equipment in accordance with the Contractor's Ship Work Breakdown Structure (SWBS) and DID I-006 ABS.

The MEL must include the following, at a minimum:

- Make, model, and tracked serial number.
 - **Tracking serial numbers** are required for each of the following items:
 - Items deemed to be a Configuration Item (CI)
 - Items deemed to be an important subcomponent of a CI
 - Items that require maintenance tasks
 - Repairable items that require data collection during maintenance to be tracked
 - Line Replaceable Units (LRUs) that will be swapped out after a failure.
- Vessel name
- Location onboard the vessel – Port, Starboard, etc.
- CCG 5-Point naming standard (Common Name/Physical Description, Brand, Material, Size, Power)
- TAG number on associated drawing
- Equipment identifier or level number
- Equipment nomenclature/description
- Original Equipment Manufacturer (OEM) name and address
- OEM model number
- OEM part number
- Supplier name and address
- Supplier equipment nomenclature/description
- Supplier's Commercial and Government Entity (CAGE) number (full address if no cage number allocated) – see Reference A.1
- Supplier part number
- Weight (kg)
- NATO Name and NATO Stock Number (NSN) – see Reference A.2
- Capacity and/or rating
- Quantity
- OEM warranty information, including coverage, terms, and start and end dates
- Identity of all components, sub-assemblies and parts down to the lowest repairable level
- Identity of the versions of all hardware and software items
- A listing of common consumable items, such as o-rings, fuses, gaskets, fasteners, and indicate where they are used.
- Rotating Item (Y/N) – see Reference A.3 Fitted Equipment. The MEL must identify Critical Equipment as listed in the CCG Fleet Safety Manual section 10.A.1 3.1 b).

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For each item identified as Critical Equipment on the MEL, the following additional information must be provided:

- Regulatory body approval
- Unit of issue
- Production lead-time
- Unique tools or support and test equipment necessary to inspect, test, calibrate, service, repair, or overhaul the end item and associated part numbers
- The name, address, telephone number of the vendor supplying the part

The long lead items on the list must be identified and must also include the following additional information, at a minimum:

- Source of supply, including the vendor name and location
- Required 'order by' date with a justification based on the project schedule
- Impact of late ordering on the schedule and cost
- Mitigation strategies to reduce the impacts on the project schedule

4. DELIVERABLES:

One (1) deliverable submission of the MEL must be delivered in accordance with the NSFRV Build Contract CDRL.

Reference A: MEL Further Instructions and Guidance

1. Commercial and Government Entity (CAGE) Code (Manufacturer) or Manufacturer/Authorized Vendor Contact Data:

If the plant where the item is manufactured does not have a CAGE code, the Contractor must provide the manufacturer's address, website, telephone number and email address in an associated Manufacturer's Contact Data List and include vendor contact data in the list, if applicable.

Note: The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM.

2. NATO Stock Number (NSN):

The contractor must provide the NSN for every individual item. The contractor must clearly indicate to Canada when the NSN is not available.

3. Repairable / Rotating Item:

Interchangeable assets that are moved in and out of service as needed, for example, motors, pumps, or computers. The term is generally applied to assets that can be repaired or refurbished rather than replaced, and can be used interchangeably at different locations or as subassemblies on different assets. Generally rotating assets have both an asset number and an inventory item number. This allows tracking of the asset as it moves from an operating location to a storeroom and vice versa. Note that this is a Maximo term.

DID I-006 Asset Breakdown Structure

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Asset Breakdown Structure (ABS).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: DID I-006 ABS Template

References: DID M-005 Technical Data Management Plan
DID I-005 Master Equipment List (MEL)
DID I-007 Recommended Spare Parts and Materiel List (RSPML)
DID I-008 Packaging, Handling, Storage and Transportability
(PHST)
DID I-009 Initial Maintenance Task List (IMTL)
DID I-010 Maintenance Task Analysis (MTA)

3. PREPARATION INSTRUCTIONS:

Format:

The ABS must be prepared in the Contractor's format. The final format must be reviewed and accepted by Canada.

The ABS must be prepared in accordance with the CCG Generic ABS.

Requirements:

The ABS must be based on the CCG's Generic ABS and particularized to suit the design. Canada will provide the generic ship structure as a Microsoft Excel file.

The ABS must follow on from the results generated for the Master Equipment List (MEL) DID I-005.

The Contractor must complete the ABS with the following required equipment information:

- The ABS code broken down by level (i.e. L1, L2, L3, etc.), full ABS code and location

- The ABS must be based on the NSFRV design. In general, the ABS for the NSFRV should extend no deeper than the equipment level
- The ABS must include all designated hardware and software configuration items
- Hardware items must appear in the ABS at the level at which they will be removed and replaced
- Software items must be identified by name, software identification number and version number
- The ABS need not identify items internal to Commercial-Off-The-Shelf (COTS) equipment that will be maintained by industry
- The lower levels of the ABS must not include repair parts, common items (such as o-rings, gaskets and fasteners) or bulk items (such as glues, paints and solvents) needed to perform maintenance. Rather, these items must be identified in the appropriate provisioning lists

The output of the ABS will inform the I-007 RSPML, I-008 PHST, I-009 IMTL and I-010 MTA.

The ABS code must be used as an identifier throughout the Work as defined in DID M-005 Technical Data Management Plan.

4. DELIVERABLES:

One (1) deliverable submission of the ABS must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-007 Recommended Spare Parts and Materiel List

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Recommended Spare Parts and Materiel List (RSPML).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: RSPML Canadian Coast Guard (CCG) Provisioning Support Excel Template

References: DID I-005 Master Equipment List (MEL)
DID I-006 Asset Breakdown Structure (ABS)
DID I-008 Packaging, Handling, Storage, and Transportability (PHST) Requirements
DID I-013 Special Tools and Test Equipment (STTE)
Reference A: RSPML Further Instructions and Guidance

3. PREPARATION INSTRUCTIONS:

Format:

The RSPML format must be prepared by the Contractor in accordance with the CCG Provisioning Support Excel Template. The final format must be reviewed and accepted by Canada.

The final version of the RSPML must be provided in Microsoft Excel and as a PDF.

Requirements:

All spares provided by the Contractor under this Contract or any potential Long Lead Items (LLI) Contracts and subject to this DID must be packaged in accordance with DID I-008 PHST.

The RSPML must identify which category the proposed spare falls under:

- **Class recommended spares** - Mandatory spares which are recommended by the Classification Society to meet minimum spare equipment requirements
- **Construction specification required spares** - Mandatory spares which are required by the Construction Specification

- **Contractor recommended spares** - spares which are recommended by the Contractor or OEM to ensure daily operation and continued availability of an equipment or system once in-service
- **Previously purchased spares and materiel** - Identify the spares and materiel purchased as commissioning spares and/or base spares
- Identify the spares, repair parts and materiel needed to support operations for the first year of vessel operations following delivery and acceptance. The RSPML must also include a lifetime inventory of those repair parts that will no longer be manufactured after the last asset is delivered

The RSPML must follow on from the deliverables for DID I-005 MEL, I-006 ABS and I-012 RMS. The output of the RSMPL will inform the I-008 PHST deliverable.

The RSPML must contain the following, at a minimum:

Item Data: TAB1 - Spares:

The Contractor must provide the following data for each recommended item. Further instructions are captured in Reference A: RSPML Further Instructions and Guidance.

Some of the following items will be populated during potential subsequent program phases.

- ABS code broken down by level (i.e. L1, L2, L3, etc.), full ABS code and location (and configuration item serial number, if applicable)
- NATO Name and NATO Stock Number (NSN) – see Reference A.1
- CCG 5-Point Naming Standard (Common Name/Physical Description, Brand, Material, Size, Power)
- Original Equipment Manufacturer (OEM) name and address
- OEM equipment nomenclature/description
- OEM model number
- OEM part number – see Reference A.2
- Item Description (Short and Long Description)
- Online Manual Weblink
- Provisioning List Line Item Sequence Number
- Authorized Supplier(s) (if different from manufacturer) name
- Supplier's Catalogue / Part Reference Number (if different from the Manufacturer's Part Number)
- Supplier's equipment nomenclature/description
- Supplier's Commercial and Government Entity (CAGE) number (full address if no cage number allocated) – see Reference A.3
- Repairable / Rotating Item (Y/N) – see Reference A.4
- Fitted quantity (number installed in the asset)

- Usage Rate Anticipated Demands Per Year
- Unit of Issue (i.e. each, box of 100, etc.)
- Procurement Lead Time (months)
- Shelf Life (in months, if applicable)
- Installed life (maximum allowable operating time)
- Contractor turnaround time (if subject to Contractor repair and overhaul)
- Materiel Safety Data Sheet (MSDS) Number (if applicable)
- Storage Location Data (if applicable) – see Reference A.5
- Price per Unit – Canadian dollars – see Reference A.6
- Lifetime Buy (if applicable; based on planned asset life)
- Recommended Buy Quantity (in same units as Unit of Issue) – see Reference A.7

Item Data: TAB 2 - Materiel:

Materiel is defined as supplies that are consumed in use, such as paint, fuel, cleaning and preserving materials, etc.; generally, these are products that are customarily consumed (i.e. used up or discarded) on a daily basis while performing vessel maintenance (predictive, preventative and corrective). Also called consumable supplies and materiel.

The Contractor must provide the following data for each recommended item. Further instructions are captured in Reference A: RSPML Further Instructions and Guidance.

Some of the following items will be populated during potential subsequent program phases.

- ABS code broken down by level (i.e. L1, L2, L3, etc.), full ABS code and location
- NATO Name and NATO Stock Number (NSN) – see Reference A.1
- CCG 5-Point Naming Standard (Common Name/Physical Description, Brand, Material, Size, Power)
- Provisioning List Line Item Sequence Number
- Manufacturer versus Local Commercial Purchase – see Reference A.8
- Manufacturer's Part Number or Product Standard/Specification Number – see Reference A.9
- Item Short and Long Description
- Online Manual Weblink
- CAGE Code (Manufacturer) – see Reference A.3
- Local Commercial Purchase – (Y/N)
- Unit of Measure (litre, ounce, etc.)

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- Shelf Life (in months, if applicable)
- Usage Rate (forecast usage per year in Unit of Measure)
- MSDS number (Y/N) – mandatory to hazardous materiel
- Storage Characteristic Handling Code
- Storage Location Data (if applicable) – see Reference A.4
- Price per Unit – Canadian dollars – see Reference A.5
- Procurement Lead Time (months)
- Lifetime Buy (in same units as Unit of Measure)
- Recommended Buy Quantity (in same units as Unit of Measure) – see Reference A.6

4. **DELIVERABLES**

One (1) deliverable submission of the RSPML must be delivered in accordance with the NSFRV Build Contract CDRL.

Reference A: RSPML Further Instructions and Guidance

1. NATO Stock Number (NSN):

The Contractor must provide the NSN for every individual item. The Contractor must clearly indicate to Canada when the NSN is not available.

2. OEM's Part Number:

If the item does not have a manufacturer's part number, then the Contractor must provide a drawing that identifies and defines the part.

3. Commercial and Government Entity (CAGE) Code (Manufacturer) or Manufacturer/Authorized Vendor Contact Data:

If the plant where the item is manufactured does not have a CAGE code, the Contractor must provide the manufacturer's address, website, telephone number and email address in an associated Manufacturer Contact Data List (TAB 4) and include vendor contact data in the list (TAB 5), if applicable.

Note: The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM.

4. Repairable / Rotating Item:

Interchangeable assets that are moved in and out of service as needed, for example, motors, pumps, or computers. The term is generally applied to assets that can be repaired or refurbished rather than replaced, and can be used interchangeably at different locations or as subassemblies on different assets. Generally rotating assets have both an asset number and an inventory item number. This allows tracking of the asset as it moves from an operating location to a storeroom and vice versa. Note that this is a Maximo term.

5. Storage Location Data:

If the RSPML is in support of ship(s), the Contractor must include the following data:

- Quantity On-Board (sail-away spares for running maintenance, per ship); and
- Quantity Ashore (per region)

The Contractor must provide an onboard storage layout plan for spare and repair parts, and all other materiel stored on-board. The plan must outline all special storage requirements, conditions and maintenance that may apply to spares and repair parts stored on-board and shore based.

6. Price per Unit:

The Price per Unit is the price in effect when the RSPML was submitted to Canada, consistent with the Recommended Buy Quantity. This data will be used for budgeting and inventory management purposes. It is understood that a future price quote for the item will reflect market value at the time.

7. Recommended Buy Quantity:

For Tab 1: Spares, if the item is repairable, the recommended buy quantity must be based on the failure rate and the repair turn around time. If the item is non-repairable, the recommended buy quantity must be based on the usage rate and the provisioning period. The need for a lifetime buy will be a consideration determined by Canada in consultation with the Contractor.

For Tab 2: Materiel, the total amount needed over the provisioning period from all sources of supply. Unit prices provided as part of the meta-data must be supported by the OEM's listed price.

8. Manufacturer versus Local Commercial Purchase:

If the item is best obtained through Local Commercial Purchase, the Manufacturer and CAGE Code fields may be left blank and the Contractor must then complete the Local Purchase field instead. In this case, the item description must be sufficient to enable purchase of the correct item.

9. Product Standard/Specification Number:

If the materiel has a specification or standard (such as 3-GP-691 for grease or HD 80W-90 for gear reducer oil), the specification or standard must be identified.

DID I-008 Packaging, Handling, Storage and Transportability Requirements List

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Packaging, Handling, Storage and Transportability (PHST) Requirements List.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: RSPML Canadian Coast Guard (CCG) Provisioning Support Excel Template

References: DID I-005 Master Equipment List (MEL)
DID I-006 Asset Breakdown Structure (ABS)
DID I-007 Recommended Spare Parts and Material List (RSPML)
DID I-013 Special Tools and Test Equipment (STTE)

3. PREPARATION INSTRUCTIONS:

Format:

The PHST Requirements List must be prepared in the RSPML CCG Provisioning Support Excel Template. The final format must be reviewed and accepted by Canada.

The PHST Requirements List must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the PHST Special Requirements List must be provided in PDF files.

Requirements:

The PHST must follow on accordingly from the deliverables for DIDs I-005 MEL, I-006 ABS, I-007 RSPML and I-013 STTE.

Special Considerations:

The PHST Requirements List must identify items of concern. An item may be considered an item of concern for any of the following reasons:

- Requires a special container for shipping
- Subject to damage from electrostatic discharge
- Requires the removal of the protective packaging only in a clean room environment

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- Subject to damage from shock (of more than 25G instantaneous)
- Subject to degradation from magnetic or electromagnetic radiation
- Subject to degradation from freezing
- Subject to degradation from humidity
- Subject to degradation from heat
- Subject to degradation from ultra-violet light
- Requires periodic maintenance while in storage (i.e. shaft rotation)
- Dangerous goods
- Hazardous material
- Must be kept in a special orientation
- Requires special external blocking or bracing
- Must have an internal blocking/locking device engaged
- Emits electromagnetic radiation that could degrade nearby susceptible items
- Requires continuous power application
- Can be without power application only for a short period of time
- Classified and must have an escort or have Controlled Goods considerations including if dismantled

Recommended Action:

Items on the PHST Requirements List must contain the following, for each special consideration item along with a recommendation to address the special consideration:

Items on the PHST Requirements list must contain the following, as a minimum:

- Packaged Length (mm)
- Packaged Width (mm)
- Packaged Depth (mm)
- Unit Pack Cube (cubic meters)
- Unit Pack Weight (Kg)
- Packing Code
- Degree Protection Code
- Hazardous Code
- Supplemental Provisioning Data/Storage/Special Handling
- Quantity Per Unit Package

4. DELIVERABLES:

One (1) deliverable submission of the PHST Requirements List must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-009 Initial Maintenance Task List

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Initial Maintenance Task List (IMTL).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID I-005 Master Equipment List (MEL)
DID I-006 Asset Breakdown Structure (ABS)
DID I-007 Recommended Spare Parts and Materiel List (RSPML)
DID I-010 Maintenance Task Analysis (MTA)
DID I-011 Maintenance Plan
Reference A: IMTL Further Instructions and Guidance

3. PREPARATION INSTRUCTIONS:

Format:

The IMTL must be prepared in the Contractor's format. The final format must be reviewed and accepted by Canada.

The IMTL must be provided as a Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the IMTL must be provided in PDF.

Requirements:

Some of the following items will be populated during potential subsequent program phases.

The IMTL must follow on accordingly from the deliverables for DID I-005 MEL and I-006 ABS. The IMTL must be developed in accordance with the New Vessel Maximo Data Entry Standard.

The IMTL must identify the proposed maintenance tasks for presentation to Canada. The IMTL must include, for each proposed task, the following information*, at a minimum**:

- ABS code broken down by level (i.e. L1, L2, L3, etc.), full ABS code and location

- CCG 5-Point Naming Standard (Common Name/Physical Description, Brand, Material, Size, Power)
- Configuration Item (CI)
- Equipment name
- Original Equipment Manufacturer (OEM) name and address
- OEM equipment nomenclature/description
- OEM model number
- OEM part number
- Supplier name and address
- Supplier equipment nomenclature/description
- Supplier's Commercial and Government Entity (CAGE) number (full address if no cage number allocated) – see Reference A.1
- Supplier part number
- Equipment identification (i.e. Commercial-off-the-shelf (COTS) or other)
- Maintenance Task Identification, including:
 - Task title
 - Task number
 - Task name (short description)
 - Task description (long description)
 - Task duration
 - Task type (e.g. Preventative Maintenance (PM), Predictive Maintenance (PdM), or Corrective Maintenance (CM))
 - Task frequency
 - Task responsibility
 - Task source (i.e. OEM, regulation, experience, etc.)
 - Task rationale
- Indicate if the task is required to maintain warranty

The output of the IMTL will inform the I-010 MTA and I-011 Maintenance Plan.

4. **DELIVERABLES:**

One (1) deliverable submission of the IMTL must be delivered in accordance with the NSFRV Build Contract CDRL.

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Reference A: IMTL Further Instructions and Guidance

1. Commercial and Government Entity (CAGE) Code (Manufacturer) or Manufacturer/Authorized Vendor Contact Data:

If the plant where the item is manufactured does not have a CAGE code, the Contractor must provide the manufacturer's address, website, telephone number and email address in an associated Manufacturer's Contact Data List and include vendor contact data in the list, if applicable

Note: The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM.

DID I-010 Maintenance Task Analysis

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Maintenance Task Analysis (MTA).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID I-005 Master Equipment List (MEL)
DID I-006 Asset Breakdown Structure (ABS)
DID I-007 Recommended Spare Parts and Materiel List (RSPML)
DID I-008 Packaging, Handling, Storage and Transportability (PHST)
DID I-009 Initial Maintenance Task List (IMTL)
DID I-013 Special Tools and Test Equipment (STTE)
DID I-018 Material Safety Data Sheets (MSDS)
Reference A: MTA Additional Information and Guidance

3. PREPARATION INSTRUCTIONS:

Format:

The MTA must be prepared in the Contractor's format. The final format must be reviewed and accepted by Canada.

The MTA must be provided as a Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the MTA must be provided in PDF files.

Requirements:

Some of the following items will be populated under DIDs I-005 MEL, I-006 ABS, I-007 RSPML, I-008 PHST, I-009 IMTL and I-013 STTE, however, they must form the basis of and be included in the Contractor's I-010 template.

The MTA must follow on accordingly from the deliverables for DIDs I-005 MEL, I-006 ABS, I-009 IMTL and I-018 MSDS. The MTA is to be developed and submitted after DID I-009 IMTL is reviewed and accepted by Canada.

The MTA must be prepared in the approved excel template and contain the following information at a minimum:

- ABS code broken down by level (i.e. L1, L2, L3, etc.), full ABS code, description and location (i.e. Port/Starboard, Aft/Forward).
- Equipment name
- Original Equipment Manufacturer (OEM) name and address
- OEM equipment nomenclature/description
- OEM model number
- OEM part number
- CCG 5-Point Naming Standard (Common Name/Physical Description, Brand, Material, Size, Power)
- NATO Name and NATO Stock Number (NSN) - see Reference A.1
- Supplier name and address
- Supplier equipment nomenclature/description
- Supplier's Commercial and Government Entity (CAGE) number (full address if no cage number allocated) – see Reference A.2
- Supplier part number
- Equipment identification (i.e. Commercial-off-the-shelf (COTS) or other)
 - Quantity
- Maintenance Task Identification, including:
 - Task title
 - Task number
 - Task name (short description)
 - Task description (long description)
 - Task duration
 - Task type (e.g. Preventative Maintenance (PM), Predictive Maintenance (PdM), or Corrective Maintenance (CM))
 - PM and CM maintenance documentation for all maintenance tasks that describes all preventive maintenance routines, including a description of the work required to complete the routine, the periodicity, and any test or conditioning monitoring activities to be conducted
 - Task frequency
 - Task responsibility
 - Task source (i.e. OEM, regulation, experience, etc.)
 - Task rationale
- Level of maintenance (1st, 2nd, 3rd) – see Reference A.3
- Job Plan, including:
 - Job Plan Number
 - Procedure

- Description of the individual maintenance tasks for all equipment, specifying the work required to complete the maintenance task.
- Safety precautions (including identifying applicable Material Safety Data Sheet(s))
- Environmental protection requirements
- Required parts, materials, tools and test equipment and consumables:
 - Type
 - Description
 - OEM
 - OEM nomenclature/description
 - OEM part number
 - NATO Name and NATO Stock Number (NSN) – see Reference A.1
 - Unit of Issue
 - Quantity required
 - Store location
- Pre-maintenance conditions
- Applicable regulations and standards
- Applicable technical data
- Troubleshooting
- Maintenance envelope requirements
- Planned Labour:
 - Trade category
 - Trade name
 - Skill Level
 - Task classification
 - Labour hours
- Performance tests, and associated test sheets, required on completion of the maintenance task to verify equipment performance
- Data collection requirements including, but not limited to:
 - Serial numbers for configuration management purposes
 - Replacement parts and serial numbers for configuration management purposes
 - Maintainer's observations
 - Measurements and readings must be identified.

The output of the MTA will inform the I-011 Maintenance Plan.

4. DELIVERABLES:

One (1) deliverable submission of the MTA must be delivered in accordance with the NSFRV Build Contract CDRL.

Reference A: MTA Further Instructions and Guidance

1. NATO Stock Number (NSN):

The Contractor must provide the NSN for every individual item. The Contractor must clearly indicate to Canada when the NSN is not available.

2. Commercial and Government Entity (CAGE) Code (Manufacturer) or Manufacturer/Authorized Vendor Contact Data:

If the plant where the item is manufactured does not have a CAGE code, the Contractor must provide the manufacturer's address, website, telephone number and email address in an associated Manufacturer's Contact Data List and include vendor contact data in the list, if applicable.

Note: *The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM.*

3. Vessel Maintenance at CCG:

Maintenance Periods

The maintenance and repair of CCG vessels is an ongoing activity that takes place in both operational and non-operational periods. The periods are as follows:

- **Operational period:** The vessel is at sea or on stand-by, fully crewed and outfitted for operations. Level 1 maintenance and some Level 2 maintenance are carried out as operations permit, but preventive maintenance dominates

Note: The terms Level 1 maintenance and operational maintenance are used interchangeably in CCG

- **Self-maintenance period:** The vessel is in planned, non-operational status, and the focus is mainly on planned and corrective maintenance. Level 1 maintenance and Level 2 maintenance are performed mainly by ship's crew under the direction of the Chief Engineer (CE). Work may also be performed by CCG shore-based teams (i.e. navigation and communication electronics) or contractors, as necessary
- **Lay-up:** The vessel is non-operational, usually because of lack of program demand or funding or both. Level 2 maintenance and

Level 3 maintenance are conducted during this period, and maintenance may be preventive or corrective

- **Alongside Refit period:** This is a planned, non-operational period during which Level 2 maintenance is performed in accordance with specifications. Work may include Level 1 maintenance items when the CE and Superintendent Marine Engineering (SME) agree to them or when repairs are required to comply with operational requirements. Level 2 maintenance may be performed by ship's crew and may involve non-vessel personnel or ship repair contractor support. Work performed includes items from the ship's Defect List and items described in vessel maintenance plans and regulatory schedules
- **Dry-dock:** The vessel is non-operational. The priority is Level 2 and Level 3 maintenance performed by shipyard workers. Fleet and ITS jointly decide the number and competency of ship's crew required to manage the shipyard work or execute work onboard the vessel. The SME, in consultation with the CE, is responsible for planning and managing the maintenance activities. Vessels may be turned over, unmanned, to the care and custody of the shipyard
- **Vessel Life Extension (VLE):** Modifications and major repairs to improve the vessel's operational reliability and extend its expected life are carried out. VLE generally addresses Level 3 maintenance but may include Level 1 and Level 2 items

Responsibility for Maintenance Tasks

Within CCG, the terms **First Line**, **Second Line**, and **Third Line** identify who is responsible for completing maintenance activities. These terms describe organizational responsibility for maintenance and represent a formal support infrastructure in which higher lines are responsible for supporting lower lines. These terms are defined as follows.

- **First Line:** Normally consists of ship's crew. Is responsible for executing the maintenance integral to vessel operations. First Line carries out such activities as filter changes, continuous equipment inspections, greasing schedules, and weekly/monthly/per-cycle equipment testing
- **Second Line:** Normally consists of CCG technician or specialized contractor technicians. It is the regional engineering personnel who

manage the maintenance required (i.e., the CCG base and the regional marine engineering office). If support is contracted, this is typically obtained through a standing offer

- **Third Line:** Normally performed by a ship repair contractor. Provides long-term support to First and Second Lines. Third Line is normally managed by a shore-based Technical Authority or Life Cycle Manager in the region or at Headquarters Management activities include the provision of engineering and maintenance support, investigation and resolution of technical problems, performance of long-term planning, etc. Scope may include major maintenance such as refits and overhauls, mid-life upgrades, and the replacement of aging equipment

Maintenance Processes

Within CCG, the terms **Level 1 maintenance**, **Level 2 maintenance**, and **Level 3 maintenance** identify established processes for executing vessel maintenance. These terms describe the nature of the maintenance work being done, and they specify where, when, and how work is done:

- **Level 1 maintenance:**
 - Nature of work: Is usually performed on systems or equipment. It includes servicing, preventive maintenance, data gathering, the preliminary diagnosis of faults, and relatively simple repairs. Level 1 maintenance tasks are normally performed relatively quickly (usually in less than three hours) and have little or no impact on vessel availability or operational status. Level 1 maintenance is also known as operational maintenance. Level 1 maintenance is managed onboard the vessel and conducted by ship's personnel with functional direction from the Regional Superintendent Marine Engineering (SME).
 - Where: at sea, on standby at anchor or on standby alongside
 - When: while the vessel is in operational status
- **Level 2 maintenance:**
 - Nature of work: may include planned or unplanned maintenance that takes the form of repairing or replacing assemblies or parts (e.g., overhauling, reconditioning, or rebuilding equipment). Level 2 maintenance is limited by resources and time. Level 2 maintenance is managed by the SME and carried out either by Line 1 (ship's personnel) or Line 2 (CCG technician or specialized contractor technicians)

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- Where: secured at alongside berth, CCG retains custody of the vessel
- When: typically while vessel is non-operational
- **Level 3 maintenance:**
 - Nature of work: This level of maintenance includes the overhaul, reconditioning, or rebuilding of equipment; mid-life modernization; and vessel life extension. Vessels undergoing Level 3 maintenance are non-operational for a predetermined time period. Typical Level 3 regulatory and maintenance is coordinated under the authority of Regional Superintendent Marine Engineering (SME), however VLE/MLM activities are normally under ITS Headquarters (HQ) Service Delivery and managed by a designated project team
 - Where: secured at Contractors facility either alongside or dry-dock, Contractor typically assumes vessel custody
 - When: while vessel is non-operational

DID I-011 Maintenance Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Maintenance Plan.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID I-005 Master Equipment List (MEL)
DID I-006 Asset Breakdown Structure (ABS)
DID I-007 Recommended Spare Parts and Materiel List (RSPML)
DID I-008 Packaging, Handling, Storage and Transportation
(PHST) Requirements List
DID I-009 Initial Maintenance Task List (IMTL)
DID I-010 Maintenance Task Analysis (MTA)
DID I-013 Special Tool and Test Equipment (STTE)
DID I-014 Training Recommendations and Analysis (TRA)
DID I-015 Training Materials and Course Delivery (TMCD)
DID I-018 Material Data Safety Sheets (MSDS)
Reference A: Maintenance Plan Additional Instructions and
Guidance

3. PREPARATION INSTRUCTIONS:

Format:

The Maintenance Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Maintenance Task Detail Sheets must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Maintenance Plan must be provided as a Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the Maintenance Plan must be provided in PDF.

The Maintenance Task Detail Sheets must be provided in Microsoft Excel format and as a searchable PDF for all versions prior to the final version. The final version of the Maintenance Task Detail Sheets must be provided in Microsoft Excel and PDF formats.

Requirements:

The Maintenance Plan must follow on from the results and the materials generated for DIDs I-005 MEL, I-006 ABS, I-007 RSPML, I-008 PHST, I-009 IMTL, I-010 MTA and I-013 STTE.

The Maintenance Plan must include data compiled into the following sections:

- Chapter 1 – System Details
- Chapter 2 – Maintenance Concept
- Chapter 3 – Safety Precautions
- Chapter 4 – Asset Breakdown Structure
- Chapter 5 – Technical Data List
- Chapter 6 – Maintenance Task Detail Sheets

Cross-references to applicable technical data, controlled documents, regulations and standards must call out specific references to sections, chapters and/or appendices, in addition to the reference title, version, reference number, and/or date of publication.

The Maintenance Task Detail Sheets must follow on from the results and the materials generated for DIDs I-005 MEL, I-006 ABS, I-007 RSPML, I-008 PHST, I-009 IMTL, I-010 MTA, I-013 STTE, I-014 TRA, I-015 TMD and I-018 MSDS.

All Maintenance Plans and Maintenance Task Detail Sheets must be provided in English and in French.

The Maintenance Task Detail Sheets must be formatted in Microsoft Excel to facilitate data entry and provide the following information at a minimum.

Some items will have been previously populated and approved under DIDs I-005 MEL, I-006 ABS, I-007 RSPML, I-008 PHST, I-009 IMTL, I-010 MTA, I-013 STTE, I-014 TRA, I-015 TMD and I-018 MSDS.

- ABS code broken down by level (i.e. L1, L2, L3, etc.), full ABS code, description and location (i.e. Port/Starboard, Aft/Forward).
- Asset Information
- Equipment Name
- Original Equipment Manufacturer (OEM) name
- OEM nomenclature/description
- OEM model number
- OEM part number
- CCG Item Master number (if available)
- CCG 5-Point Naming Standard (Common Name/Physical Description, Brand, Material, Size, Power)

- NATO Name and NATO Stock Number (NSN) - see Reference A.1
- Rotating/Non-Rotating – See Reference A.2
- Critical (System Level) or Storeroom Critical (Inventory Level)
- Equipment Identification (i.e. component ID based on MEL designation).
- Item Assembly Structure (parent-level rotating items/assets and child rotating items and consumable parts)
- Level of maintenance (1st, 2nd, 3rd) – See Reference A.3
 - Including 3rd level support facility
- Job Plan:
 - Job Plan Number
 - Title (short description); follow short description format: Class and Equipment, Frequency, Verb or Action (i.e. Caterpillar C18 H500 Service)
 - Long description [i.e. safety precautions (including identifying applicable MSDS), pre-maintenance conditions, troubleshooting procedures, assembly instructions, drawings, diagnostics, disassembly, rectification, reassembly, check-out procedure, warranty, etc.]
 - Job Plan Owner
 - Priority (1, 2, 3, 4, 5) and verb (i.e. clean, inspect, lubricate, etc.)
 - Status
 - Duration
 - Schedule Type (i.e. calendar, hours, cycles)
- Job Plan Tasks:
 - Task type (i.e. predictive maintenance, preventative maintenance, corrective maintenance)
 - Include interval, interval type and interval measure
 - Predictive Maintenance (PdM) Specification Worksheet and Data Collection Worksheet (if applicable)
 - Task line (i.e. 10, 20, 30, etc.)
 - Task short description
 - Task duration
 - Task long description:
 - For mandatory tasks, this includes but is not limited to:
 - Safety procedures (task line 10); safety issues related to maintenance tasks such as lock out and/or tag out, entry to confined spaces and Hazardous Materials (HAZMAT), etc.
 - Maintenance completion record data collection requirements including, but not limited to:
 - Serial numbers for configuration management purposes.
 - Replacement parts and serial numbers for configuration management purposes

- Maintainer's observations and any corrective maintenance performed
 - Measurements, anomalies and readings must be identified
 - Action required to restore equipment to a ready-to-run state
 - Action required to maintain warranty.
 - Duration (actual)
 - Proof of performance
- References to applicable technical data, controlled documents, regulations and standards. Note: Cross-references must call out specific references to sections, chapters and/or appendices, in addition to the reference title, version, reference number, and/or date of publication
- Condition monitoring and / or equipment health monitoring data
- Maintenance envelope requirements
- System drawings and images
- Details such as equipment removal routes and lifting points must also be provided where applicable
- Computer and/or software resources required must be identified if applicable
- Environmental issues related to maintenance task must be identified
- Identify OEM extended warranty (as applicable)
- Required parts, materials, special tools and test equipment and consumables:
 - Item Master Number (where available)
 - Type
 - OEM
 - OEM nomenclature/description
 - OEM part number
 - NATO Name and NATO Stock Number (NSN) – see Reference A.1
 - Unit of Issue
 - Quantity required
 - Store location
 - Packaging, Handling and Storage
 - Supplier's nomenclature/description
 - Supplier's part number
- Planned Labour:
 - Trade Name
 - Trade Category/Craft
 - Skill Level
 - Quantity

- Task Classification
- Labour Hours
- Training and Training Equipment
- Other comments (as applicable).

These worksheets must be provided progressively to Canada as they are developed by the Contractor on a system-by-system basis (i.e. functionally related group of equipment).

The Maintenance Plan must also identify all condition monitoring and/or equipment health monitoring data collated by the Ship Control and Monitoring System or Alarm Monitoring Systems.

The Maintenance Plan must also provide routine inspection procedures and check-off lists to be accomplished prior to leaving the Machinery Plant unattended.

4. DELIVERABLES:

One (1) deliverable submission of the Maintenance Plan must be delivered in accordance with the NSFRV Build Contract CDRL.

Reference A: Maintenance Plan Additional Instructions and Guidance

1. NATO Stock Number (NSN):

The Contractor must provide the NSN for every individual item. The Contractor must clearly indicate to Canada when the NSN is not available.

2. Repairable / Rotating Item:

Interchangeable assets that are moved in and out of service as needed, for example, motors, pumps, or computers. The term is generally applied to assets that can be repaired or refurbished rather than replaced, and can be used interchangeably at different locations or as subassemblies on different assets. Generally rotating assets have both an asset number and an inventory item number. This allows tracking of the asset as it moves from an operating location to a storeroom and vice versa. Note that this is a Maximo term

3. Vessel Maintenance at CCG:

Maintenance Periods

The maintenance and repair of CCG vessels is an ongoing activity that takes place in both operational and non-operational periods. The periods are as follows:

- **Operational period:** The vessel is at sea or on stand-by, fully crewed and outfitted for operations. Level 1 maintenance and some Level 2 maintenance are carried out as operations permit, but preventive maintenance dominates.

Note: The terms Level 1 maintenance and operational maintenance are used interchangeably in CCG.

- **Self-maintenance period:** The vessel is in planned, non-operational status, and the focus is mainly on planned and corrective maintenance. Level 1 maintenance and Level 2 maintenance are performed mainly by ship's crew under the direction of the Chief Engineer (CE). Work may also be performed by CCG shore-based teams (i.e. navigation and communication electronics) or contractors, as necessary.
- **Lay-up:** The vessel is non-operational, usually because of lack of program demand or funding or both. Level 2 maintenance and Level 3 maintenance are conducted during this period, and maintenance may be preventive or corrective.
- **Alongside Refit period:** This is a planned, non-operational period during which Level 2 maintenance is performed in accordance with

specifications. Work may include Level 1 maintenance items when the CE and Superintendent Marine Engineering (SME) agree to them or when repairs are required to comply with operational requirements. Level 2 maintenance may be performed by ship's crew and may involve non-vessel personnel or ship repair contractor support. Work performed includes items from the ship's Defect List and items described in vessel maintenance plans and regulatory schedules.

- **Dry-dock:** The vessel is non-operational. The priority is Level 2 and Level 3 maintenance performed by shipyard workers. Fleet and ITS jointly decide the number and competency of ship's crew required to manage the shipyard work or execute work onboard the vessel. The SME, in consultation with the CE, is responsible for planning and managing the maintenance activities. Vessels may be turned over, unmanned, to the care and custody of the shipyard.
- **Vessel Life Extension (VLE):** Modifications and major repairs to improve the vessel's operational reliability and extend its expected life are carried out. VLE generally addresses Level 3 maintenance but may include Level 1 and Level 2 items.

Responsibility for Maintenance Tasks

Within CCG, the terms **First Line**, **Second Line**, and **Third Line** identify who is responsible for completing maintenance activities. These terms describe organizational responsibility for maintenance and represent a formal support infrastructure in which higher lines are responsible for supporting lower lines. These terms are defined as follows.

- **First Line:** Normally consists of ship's crew. Is responsible for executing the maintenance integral to vessel operations. First Line carries out such activities as filter changes, continuous equipment inspections, greasing schedules, and weekly/monthly/per-cycle equipment testing.
- **Second Line:** Normally consists of CCG technician or specialized contractor technicians. It is the regional engineering personnel who manage the maintenance required (i.e., the CCG base and the regional marine engineering office). If support is contracted, this is typically obtained through a standing offer.
- **Third Line:** Normally performed by a ship repair contractor. Provides long-term support to First and Second Lines. Third Line is normally managed by a shore-based Technical Authority or Life Cycle Manager in the region or at Headquarters Management activities include the provision of engineering and maintenance support, investigation and

resolution of technical problems, performance of long-term planning, etc. Scope may include major maintenance such as refits and overhauls, mid-life upgrades, and the replacement of aging equipment.

Maintenance Processes

Within CCG, the terms **Level 1 maintenance**, **Level 2 maintenance**, and **Level 3 maintenance** identify established processes for executing vessel maintenance. These terms describe the nature of the maintenance work being done, and they specify where, when, and how work is done:

- **Level 1 maintenance:**
 - Nature of work: Is usually performed on systems or equipment. It includes servicing, preventive maintenance, data gathering, the preliminary diagnosis of faults, and relatively simple repairs. Level 1 maintenance tasks are normally performed relatively quickly (usually in less than three hours) and have little or no impact on vessel availability or operational status. Level 1 maintenance is also known as operational maintenance. Level 1 maintenance is managed onboard the vessel and conducted by ship's personnel with functional direction from the Regional Superintendent Marine Engineering (SME)
 - Where: at sea, on standby at anchor or on standby alongside
 - When: while the vessel is in operational status
- **Level 2 maintenance:**
 - Nature of work: may include planned or unplanned maintenance that takes the form of repairing or replacing assemblies or parts (e.g., overhauling, reconditioning, or rebuilding equipment). Level 2 maintenance is limited by resources and time. Level 2 maintenance is managed by the SME and carried out either by Line 1 (ship's personnel) or Line 2 (CCG technician or specialized contractor technicians)
 - Where: secured at alongside berth, CCG retains custody of the vessel
 - When: typically while vessel is non-operational
- **Level 3 maintenance:**
 - Nature of work: This level of maintenance includes the overhaul, reconditioning, or rebuilding of equipment; mid-life modernization; and vessel life extension. Vessels undergoing Level 3 maintenance are non-operational for a predetermined time period. Typical Level 3 regulatory and maintenance is coordinated under the authority of Regional Superintendent Marine Engineering (SME), however

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- VLE/MLM activities are normally under ITS Headquarters (HQ)
Service Delivery and managed by a designated project team
- Where: secured at Contractors facility either alongside or dry-dock,
Contractor typically assumes vessel custody
 - When: while vessel is non-operational

DID I-013 Special Tools and Test Equipment

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Special Tools and Test Equipment (STTE).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: DID I-007 Recommended Spare Parts and Materiel List (RSMPL)
DID I-008 Packaging, Handling, Storage and Transportation
(PHST) Requirements List
DID I-013 STTE Excel Template – Tab 3 – STTE

References: DID I-007 Recommended Spare Parts and Materiel List (RSPML)
Reference A: STTE Additional Instructions and Guidance

3. PREPARATION INSTRUCTIONS:

Format:

The STTE list format must be prepared in accordance with DID I-007 RSMPL, I-008 PHST & I-013 STTE Excel Template. The final format must be reviewed and accepted by Canada.

The STTE list must be provided as a Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the STTE list must be provided in PDF.

Requirements:

The STTE List must identify which category that the proposed special tool and test equipment falls under:

- **Class recommended STTE** - Mandatory STTE which are required to meet minimum Classification Society requirements.
- **Construction specification required STTE** - Mandatory STTE which are required by the Construction Specification.
- **Contractor recommended STTE** - Recommended STTE required to conduct all maintenance activities defined in the IMTL.
- **Previously purchased STTE** - Identify the STTE purchased for installation and commissioning.

Item Data:

Tab 3 - STTE list must provide the following data for each recommended item:

- NATO name and NATO Stock Number (NSN) - see Reference A.1
- CCG 5-Point Naming Standard (Common Name/Physical Description, Brand, Material, Size, Power)
- ABS code broken down by level (i.e. L1, L2, L3, etc.), full ABS code and location (and configuration item serial number, if applicable).
- Original Equipment Manufacturer (OEM)
- OEM's Part Number – see Reference A.2
- OEM's Model Number
- Item Description (Short and Long Description)
- Online Manual Weblink
- Provisioning List Line Item Sequence Number
- Commercial and Government Entity (CAGE) Code (Manufacturer) – see Reference A.3
- Authorized Supplier(s) / Vendor(s) (if different from Manufacturer)
- Supplier's Catalogue / Part Reference Number (if different from the Manufacturer's Part Number)
- Reference to Applicable Maintenance Task
- Maintenance Level
- Quantity per Maintenance Level required
- Associated Software Details
- Local Commercial Purchase (Y/N) – see Reference A.4
- Storage location (if applicable) – see Reference A.5
- Document Number of Supplier's User Manual
- Calibration Required (Y/N)
- Calibration Interval
- Calibration Procedure in User Manual (Y/N)
- Procurement Lead Time (months)
- Unit Length (mm)
- Unit Depth (mm)
- Unit Height (mm)
- Unit Weight (Kg)
- Recommended Quantity – see Reference A.6
- Price per Unit – Canadian dollars – see Reference A.7

4. DELIVERABLES:

One (1) deliverable submission of the STTE must be delivered in accordance with the NSFRV Build Contract CDRL.

Reference A: STTE Additional Instructions and Guidance

1. NATO Stock Number (NSN):

The contractor must provide the NSN for every individual item. The contractor must clearly indicate to Canada when the NSN is not available

2. OEM's Part Number:

If the item does not have a manufacturer's part number, then the Contractor must provide a drawing that identifies and defines the part.

3. CAGE Code / Manufacturer Contact Data:

If the plant where the item is manufactured does not have a CAGE code, the Contractor must provide the manufacturer's address, website, telephone number and email address in an associated Manufacturer Contact Data List (TAB 4) and include vendor contact data in the list (TAB 5), if applicable.

Note: The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM.

4. Manufacturer versus Local Commercial Purchase:

If the item is best obtained through Local Commercial Purchase, the Manufacturer and CAGE Code fields may be left blank and the Contractor must then complete the Local Purchase field instead. In this case, the item description must be sufficient to enable purchase of the correct item.

5. Storage Location:

If the Recommended STTE is in support of ship(s), then include the following data:

- Quantity On-Board (sail-away STTE for running maintenance, per ship)
- Quantity Ashore (per region)

6. Recommended Buy Quantity:

The total number needed by the CCG above any quantity already held. Unit prices provided as part of the meta-data must be supported by the OEM's listed price.

Contract No. – N° de contrat
F7013-[Insert Contract #]
Client Ref. No. - N° de réf. du
client
F7013-[Insert PO #]

Amd. No. - N° de la modif.
File No. - N° du dossier
[Insert File #]

Buyer ID – Id de l'acheteur
[Insert Buyer ID]

7. Price per Unit:

The Price per Unit is the price in effect when the STTE was submitted to Canada, consistent with the Recommended Buy Quantity. This data will be used for budgeting and inventory management purposes. It is understood that a future price quote for the item will reflect market value at the time.

DID I-014 Training Recommendations and Analysis

1. PURPOSE of DID

The purpose of this DID is to identify to the Contractor the requirements for the Training Recommendations and Analysis (TRA).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID I-001 Class Manual
DID I-004 Trim and Stability Booklet
DID I-011 Maintenance Plan
DID I-015 Training Materials and Course Delivery (TMCD)
Reference A: TRA Additional Information and Guidance

3. PREPARATION INSTRUCTIONS:

Format:

The Recommended Training documents must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Recommended Training documents must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the Recommended Training must be provided in PDF files.

Requirements:

The Recommended Training deliverables will consist of two phases. The objective of Phase 1 is to determine the list of necessary training via a Training Needs Analysis (TNA). Phase 2 will entail taking the agreed upon list of necessary training generated during Phase 1 and creating the proposed suite of training materials and corresponding training delivery schedule.

Phase 1:

The Contractor is to provide a list of all available training (e.g. OEM courses), including costs, language, locations, durations, and type of training. CCG and the Contractor will then conduct a joint TRA to determine CCG's additional training requirements.

The TRA must focus on 3 aspects of training: type of training, personnel requiring training by position and or department, and systems to be trained on.

- **Types:** The proposed types of training shall fall into 3 categories, as appropriate: Familiarization, Operation and Maintenance (include information on Level 1, Level 2 and Level 3 Maintenance, as this will assist with identifying who requires the training) – see Reference A.1
- **Personnel:** The TRA must also identify the crew positions that will need any or all three categories of the training. As a subset, the TRA must list the anticipated level of prerequisite experience for each trainee.
- **Systems:** The following is a preliminary list of systems that will require a TRA and will need to be adjusted once the technical information on the ship is available:
 - General Information and ship layout including program compartments / lab arrangements
 - Key safety features (including water tight doors, escape routes, fire detection and fire suppression systems, fire main, hoses, firefighting lockers, smoke hoods and air packs etc.)
 - Lifesaving equipment
 - Stability (general statement details will be in the trim and stability booklet)
 - Tank capacity tables
 - Ballast system (including filling, transfer and discharge etc.)
 - Main propulsion system and machinery control system
 - Ship control monitoring system (SCMS)
 - Electrical generation and distribution system
 - Energy Storage System (ESS)
 - Fuel storage and transfer system (including filling and add the lubrication oil filling, transfer and storage system, etc.)
 - Compressed air system
 - Steering system (including Bow Thrusters and AZ Pods)
 - Firefighting system
 - Bilge suction system (including oily water separator and storage, tank filling, transfer and discharge etc.)
 - Navigation systems
 - Bridge control systems
 - Internal communications system
 - External communications system
 - Heating, ventilation & air conditioning system (HVAC)
 - Deck machinery
 - Fresh water system (including reverse osmosis system, waste heat evaporators etc.)
 - Oily water system
 - Domestic systems and equipment, including sanitary systems (such as black and grey water systems)

- Auxiliary equipment and control (including refrigeration and freezer systems, etc.)
- Hull, and working deck equipment (including missions equipment, anchor windlass, cranes, davits, rigid hull inflatable boat davit)
- Machine tools and industrial shop equipment.

On completion of the TRA the Contractor must correlate the information and provide a matrix showing all of the proposed training that addresses all 3 aspects of any proposed course, including what type of training is needed, who must attend, and what system(s) the course will address.

The Contractor and CCG will then jointly review the list generated as an output of the TRA to determine exactly which courses CCG requires.

Once that list has been agreed upon between Canada and the Contractor, the list shall be used to begin to create training materials.

Phase 2:

The Contractor must further develop the Recommended Training package to create a skeleton Table of Contents (ToC) of the proposed curriculum for all proposed courses. Within each subsection of the ToC, the Contractor must provide some high level text describing the objective and subjects of each subsection of each course.

From this the Contractor will then develop a full Training Plan and schedule in accordance with DID I-015 TMCD.

4. DELIVERABLES:

One (1) deliverable submission of the Training Recommendations and Analysis must be delivered in accordance with the NSFRV Build Contract CDRL.

Reference A: TRA Additional Information and Guidance

1. Vessel Maintenance at CCG:

Maintenance Periods

The maintenance and repair of CCG vessels is an ongoing activity that takes place in both operational and non-operational periods. The periods are as follows:

- **Operational period:** The vessel is at sea or on stand-by, fully crewed and outfitted for operations. Level 1 maintenance and some Level 2 maintenance are carried out as operations permit, but preventive maintenance dominates.

Note: The terms Level 1 maintenance and operational maintenance are used interchangeably in CCG.
- **Self-maintenance period:** The vessel is in planned, non-operational status, and the focus is mainly on planned and corrective maintenance. Level 1 maintenance and Level 2 maintenance are performed mainly by ship's crew under the direction of the Chief Engineer (CE). Work may also be performed by CCG shore-based teams (i.e. navigation and communication electronics) or contractors, as necessary.
- **Lay-up:** The vessel is non-operational, usually because of lack of program demand or funding or both. Level 2 maintenance and Level 3 maintenance are conducted during this period, and maintenance may be preventive or corrective.
- **Alongside Refit period:** This is a planned, non-operational period during which Level 2 maintenance is performed in accordance with specifications. Work may include Level 1 maintenance items when the CE and Superintendent Marine Engineering (SME) agree to them or when repairs are required to comply with operational requirements. Level 2 maintenance may be performed by ship's crew and may involve non-vessel personnel or ship repair contractor support. Work performed includes items from the ship's Defect List and items described in vessel maintenance plans and regulatory schedules.
- **Dry-dock:** The vessel is non-operational. The priority is Level 2 and Level 3 maintenance performed by shipyard workers. Fleet and ITS jointly decide the number and competency of ship's crew required to manage the shipyard work or execute work onboard the vessel. The SME, in consultation with the CE, is responsible for planning and

managing the maintenance activities. Vessels may be turned over, unmanned, to the care and custody of the shipyard.

- **Vessel Life Extension (VLE):** Modifications and major repairs to improve the vessel's operational reliability and extend its expected life are carried out. VLE generally addresses Level 3 maintenance but may include Level 1 and Level 2 items.

Responsibility for Maintenance Tasks

Within CCG, the terms **First Line**, **Second Line**, and **Third Line** identify who is responsible for completing maintenance activities. These terms describe organizational responsibility for maintenance and represent a formal support infrastructure in which higher lines are responsible for supporting lower lines. These terms are defined as follows.

- **First Line:** Normally consists of ship's crew. Is responsible for executing the maintenance integral to vessel operations. First Line carries out such activities as filter changes, continuous equipment inspections, greasing schedules, and weekly/monthly/per-cycle equipment testing.
- **Second Line:** Normally consists of CCG technician or specialized contractor technicians. It is the regional engineering personnel who manage the maintenance required (i.e., the CCG base and the regional marine engineering office). If support is contracted, this is typically obtained through a standing offer.
- **Third Line:** Normally performed by a ship repair contractor. Provides long-term support to First and Second Lines. Third Line is normally managed by a shore-based Technical Authority or Life Cycle Manager in the region or at Headquarters Management activities include the provision of engineering and maintenance support, investigation and resolution of technical problems, performance of long-term planning, etc. Scope may include major maintenance such as refits and overhauls, mid-life upgrades, and the replacement of aging equipment

Maintenance Processes

Within CCG, the terms **Level 1 maintenance**, **Level 2 maintenance**, and **Level 3 maintenance** identify established processes for executing vessel maintenance. These terms describe the nature of the maintenance work being done, and they specify where, when, and how work is done:

- **Level 1 maintenance:**
 - Nature of work: Is usually performed on systems or equipment. It includes servicing, preventive maintenance, data gathering, the preliminary diagnosis of faults, and relatively simple repairs. Level 1 maintenance tasks are normally performed relatively quickly (usually in less than three hours) and have little or no impact on vessel availability or operational status. Level 1 maintenance is also known as operational maintenance. Level 1 maintenance is managed onboard the vessel and conducted by ship's personnel with functional direction from the Regional Superintendent Marine Engineering (SME).
 - Where: at sea, on standby at anchor or on standby alongside
 - When: while the vessel is in operational status
- **Level 2 maintenance:**
 - Nature of work: may include planned or unplanned maintenance that takes the form of repairing or replacing assemblies or parts (e.g., overhauling, reconditioning, or rebuilding equipment). Level 2 maintenance is limited by resources and time. Level 2 maintenance is managed by the SME and carried out either by Line 1 (ship's personnel) or Line 2 (CCG technician or specialized contractor technicians).
 - Where: secured at alongside berth, CCG retains custody of the vessel
 - When: typically while vessel is non-operational
- **Level 3 maintenance:**
 - Nature of work: This level of maintenance includes the overhaul, reconditioning, or rebuilding of equipment; mid-life modernization; and vessel life extension. Vessels undergoing Level 3 maintenance are non-operational for a predetermined time period. Typical Level 3 regulatory and maintenance is coordinated under the authority of Regional Superintendent Marine Engineering (SME), however VLE/MLM activities are normally under ITS Headquarters (HQ) Service Delivery and managed by a designated project team.
 - Where: secured at Contractors facility either alongside or dry-dock, Contractor typically assumes vessel custody.
 - When: while vessel is non-operational

DID I-015 Training Materials and Course Delivery

1. PURPOSE of DID

The purpose of this DID is to identify to the Contractor the requirements for the Training Materials and Course Delivery (TMCD).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-002 Integrated Master Schedule
DID I-001 Class Manual
DID I-011 Maintenance Plan
DID I-014 Training Recommendations and Analysis (TRA)

3. PREPARATION INSTRUCTIONS:

Format:

The TMCD documentation must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The TMCD documentation must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the TMCD documentation must be provided in PDF files.

Requirements:

The Training Materials must follow on from the result of the recommended training package developed in response to DID I-014 TRA. The training materials are to be used to train to the agreed content from that deliverable.

The training materials must include:

- Training Plan
- Course Syllabus
- Master Lesson Plan
- Training Aids and Training Aids Document
- Instructor Manual
- Student Manual
- Course Evaluation and Feedback Form

The Training Materials must be provided in English and in French.

A schedule must be provided indicating how and where training will be delivered. The training schedule must be integrated as part of the Master Project Schedule delivered in accordance with M-002.

The training schedule may be phased to meet the needs of the overall program for the vessels following consultation with and approval by CCG.

The training shall be delivered in English and in French, following consultation with and approval by CCG.

Upon acceptance of the proposed course materials and the schedule, the Contractor must deliver the training in accordance with the CCG approved curriculum and as per the schedule.

The Contractor will arrange to ensure that all training is provided by suitably qualified personnel and or OEM factory certified representatives as applicable.

The Contractor will ensure that all training is supported by relevant vessel publications, support publications, technical publications and engineering data.

All Contractor Training Plan deliverables must be satisfied prior to Acceptance of the first vessel by CCG.

4. **DELIVERABLES:**

One (1) deliverable submission of the TMCD must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-016 Obsolescence Notices

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Obsolescence Notices.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID I-005 Master Equipment List (MEL)
DID I-006 Asset Breakdown Structure (ABS)
DID I-007 Recommended Spare Parts and Materiel List (RSPML)

3. PREPARATION INSTRUCTIONS:

Format:

The Obsolescence Notices must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

An index of Obsolescence Notices must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Obsolescence Notices and Index must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the Obsolescence Notices must be provided in PDF files.

Requirements:

If existing Obsolescence Notices are available from the Original Equipment Manufacturer (OEM) then they are preferred, but they must match the requirements set out below.

Obsolescence Notices issued must contain the following information, at a minimum:

- Unique Obsolescence Notice identifier
- Title of Obsolescence Notice
- The date issued to the Prime
- The date of the Obsolescence Notice release
- Last chance buy identified (Y/N)

Contract No. – N° de contrat
F7013-[Insert Contract #]
Client Ref. No. - N° de réf. du
client
F7013-[Insert PO #]

Amd. No. - N° de la modif.
File No. - N° du dossier
[Insert File #]

Buyer ID – Id de l'acheteur
[Insert Buyer ID]

- Item obsolescent or obsolete
- End of obsolescence period
- Configuration item serial number and ABS number (if applicable)
- Supplier part number
- Supplier equipment nomenclature/description
- OEM part number
- OEM equipment nomenclature/description
- A description of the obsolescence issue, including:
 - Whether the issue is end of sale of a particular part
 - End of sale of a product line
 - End of support
 - The relevant dates
- A description of the impact(s) to the subsystem affected
- The Supplier's recommendations

The Obsolescence Notices must include any attachments or general information that aids in the understanding, and will define any terms and acronyms used.

4. DELIVERABLES:

One (1) deliverable submission of the Obsolescence Notices must be delivered in accordance with the NSFRV Build Contract CDRL.

Contract No. – N° de contrat
F7013-[Insert Contract #]
Client Ref. No. – N° de réf. du
client
F7013-[Insert PO #]

Amd. No. - N° de la modif.
File No. - N° du dossier
[Insert File #]

Buyer ID – Id de l'acheteur
[Insert Buyer ID]

DID I-017 Disposal Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Disposal Plan for applicable equipment during the lifecycle of the vessel.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Disposal Plan must be provided in its existing format as created by the Original Equipment Manufacturer (OEM).

The Disposal Plan worksheets must be prepared in the Contractor's format. The final format must be reviewed and accepted by Canada.

The Disposal Plan Worksheets must be provided as a Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the Disposal Plan Worksheets must be provided in PDF files.

Requirements:

Where available, existing disposal plans from the OEM must be provided.

The Disposal Plan Worksheets must contain the following information, at a minimum:

- Unit Disposal Costs
- Controlled Goods Disposal Costs (if applicable)
- Hazardous Material Disposal Costs
- Disposal Packaging and Handling Costs
- Expected Item Life
- Disposal Methods and Procedures
- Agency or personnel responsible for disposal
- Safety provision for disposal
- Environmental provisions for disposal
- Resale potential of item

Contract No. – N° de contrat
F7013-[Insert Contract #]
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client
F7013-[Insert PO #]

Amd. No. - N° de la modif.
File No. - N° du dossier
[Insert File #]

Buyer ID – Id de l'acheteur
[Insert Buyer ID]

4. **DELIVERABLES:**

One (1) deliverable submission of the Disposal Plan must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-018 Material Safety Data Sheets

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Material Safety Data Sheets (MSDS).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: Workplace Hazardous Materials Information System (WHMIS)
DID I-011 Maintenance Plan

3. PREPARATION INSTRUCTIONS:

Format:

The MSDS must be provided in accordance with WHMIS standards.

An index must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The MSDS Index must be provided as a Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the MSDS Index must be provided in PDF.

Requirements:

All relevant MSDS must be posted in accordance with WHMIS standards and located onboard the vessel accordingly.

The MSDS must be provided in English and in French.

4. DELIVERABLES:

One (1) deliverable submission of the MSDS – English must be delivered in accordance with the NSFRV Build Contract CDRL.

One (1) deliverable submission of the MSDS – French must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-019 As-Fitted Drawing Package

1. PURPOSE of DID:

The purpose of this DID to identify to the Contractor the requirements for the As-Fitted Drawing Package.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: Required As-Fitted Drawing List (To be finalized at a later date)
DID I-003 OEM Manuals and Technical Publications
DID I-019 Technical Data Deliverables Metadata Index

References: Canadian Coast Guard (CCG) Marine Engineering AutoCAD
Template And User Guide (GCDocs # 25019221)
DID M-017 System Drawing Requirements
DID M-019 Arrangement Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The As-Fitted Drawings must be prepared in accordance with CCG Marine Engineering AutoCAD Template And User Guide.

As-Fitted Drawings must be arranged such that, when printed, they are sized in accordance with CCG Marine Engineering AutoCAD Template And User Guide.

As-Fitted Drawings must be drafted in accordance with CCG Marine Engineering AutoCAD Template And User Guide as provided.

The scale on each plan must not be greater than 1:100. When this is impractical, a larger scale or a larger sheet size, including custom sizes, may be used.

All necessary supplementary drawing data files, such as *.ctb format files, must be provided.

Delivery of drawings is to be multi-sheet drawings contained within a single file as opposed to single file per sheet methodology.

A *.dwf, .dwg, and PDF file shall constitute the record.

As such, the files must be configured to be suitable for printing to the size paper indicated in the drawing's title block without the need for scaling. The PDF files must be monotone (black and white) unless special requirements necessitate the use of colours (e.g. safety plans).

Requirements:

The individual as-fitted drawings are detailed in the Required As-Fitted Drawing List attached. The contractor is responsible to issue a representative and complete as-fitted drawing package, specific to the vessel in .dwf, .dwg and PDF formats.

The As-Fitted Drawings must be provided in English and in French format.

The diagrams must include:

- System components (equipment)
- Vendor makes
- Model numbers
- Location in relation with the General Arrangement (GA)
- Interconnection between components.

An index must be provided in English and in French format and in accordance with the Technical Data Deliverable Metadata Index attached. All drawings with relevant or required External Reference (XRefs) must be identified in the I-003 OEM Manuals and Technical Publications & I-019 As-Fitted Drawings Technical Data Deliverables Metadata Index. Metadata must be populated in a consistent approach (i.e. Revision Date: YYYY-MM-DD vice MM-DD-YY). Formatting instructions will be provided in the DID I-003 OEM Manuals and Technical Publications and DID I-019 Technical Data Deliverables Metadata Index.

If Classification Society or Regulatory Body approvals are required, they must be stamped on the drawing.

4. DELIVERABLES:

One (1) deliverable submission of the As-Fitted Drawing Package – English must be delivered in accordance with the NSFRV Build Contract CDRL.

One (1) deliverable submission of the As-Fitted Drawing Package – French must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-020 Equipment Certification Register

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for an Equipment Certification Register.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID I-005 Master Equipment List (MEL)
DID I-006 Asset Breakdown Structure (ABS)
DID T-078 Bill of Material (BoM)

3. PREPARATION INSTRUCTIONS:

Format:

The Equipment Certification Register must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Equipment Certification Register must be provided in Microsoft Excel and as a searchable PDF sized to fit either 8.5"x14" or 11"x17" standard size printer paper.

Requirements:

The Contractor must provide an Equipment Certification Register listing any equipment, material or supplies having an expiry date as defined by its Regulatory and/or Safety Certification Certificates. All equipment, materials or supplies identified in the Equipment Certification Register must have a remaining life of no less than 10 months after the date of Vessel Acceptance.

Equipment, materials or supplies that are tracked under the Tackle Registry need not be reproduced for the Equipment Certification Register.

The Equipment Certification Register must specify equipment in accordance with the Contractor's DID I-005 MEL and DID I-006 ABS.

The Equipment Certification Register must include the following, at a minimum:

- MEL cross-reference (Shipyard Part Number where available)
- Tracked serial numbers

Contract No. – N° de contrat
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client
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Amd. No. - N° de la modif.
File No. - N° du dossier
[Insert File #]

Buyer ID – Id de l'acheteur
[Insert Buyer ID]

- Date of manufacture
- Date of installation/commissioning
- Date of certificate expiry
- Detailed list of system components (equipment)
- Storage and/or installation location

4. **DELIVERABLES:**

One (1) deliverable submission of the Equipment Certification Register must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-022 Inventory of Hazardous Materials

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Inventory of Hazardous Materials (IHM).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: 2015 Guidelines For The Development Of The Inventory Of Hazardous Materials, Resolution MEPC.269(68)

3. PREPARATION INSTRUCTIONS:

Format:

The IHM must be prepared in accordance with the 2015 Guidelines For The Development of The Inventory of Hazardous Materials, Resolution MEPC.269(68). The format must be reviewed and accepted by Canada.

The IHM must be provided in Microsoft Office suite format and as a searchable PDF.

Requirements:

The Inventory of Hazardous Materials must address Part I and Part III of Section 3.1 of the 2015 Guidelines For The Development of The Inventory of Hazardous Materials, Resolution MEPC.269(68) and be developed in accordance with Section 4.1, 4.6, 4.7 and 5.1 of 2015 the Guidelines For The Development Of The Inventory of Hazardous Materials, Resolution MEPC.269(68).

4. DELIVERABLES:

One (1) deliverable submission of the IHM must be delivered in accordance with the NSFRV Build Contract CDRL.

DID I-023 Life-Cycle Cost Analysis

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for conducting the Life-Cycle Cost (LCC) Analysis.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: LCC Analysis Template

References: ISO 15686-5:2017-E Building and Constructed Assets – Service Life Planning: Part 5: Life Cycle Costing

3. PREPARATION INSTRUCTIONS:

Format:

The LCC Analysis must be prepared in accordance with ISO 15686-5: 2017-E Building and Constructed Assets: – Service Life Planning Part 5: Life Cycle Costing.

The format must be reviewed and accepted by Canada.

The LCC Analysis must be provided in Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version of the LCC Analysis must be provided in Microsoft Word, Microsoft Excel, and PDF formats.

Requirement:

The Contractor's LCC Analysis must quantify the life-cycle cost for input into CCG decision-making and evaluation processes, and must also include inputs from other evaluations (i.e. environmental assessments, design assessments, safety assessments, functionality assessments and regulatory compliance assessments).

The quantification must be to the level of detail required to meet the ISO 15686-5:2017-E Building and Constructed Assets – Service Life Planning: Part 5: Life Cycle Costing standard for the key project stages (i.e. Basic Design, Construction Engineering, Build, etc.). The scope of costs included/excluded from an LCC Analysis must be defined and agreed to by Canada.

NOTE 1: LCC takes into account cost or cash flows, i.e. relevant costs (including income and externalities if included in the agreed scope) arising from acquisition through operation to disposal.

NOTE 2: LCC typically includes a comparison between alternatives or an estimate of future costs at the component level. LCC is performed over an agreed upon period of analysis, clearly identifying whether the analysis is for part of or the entire life-cycle of the constructed asset.

The LCC Analysis shall include, but not be limited to the following in accordance with ISO 15686-5:2017-E Building and Constructed Assets – Service Life Planning: Part 5: Life Cycle Costing:

Whole Life Cost (WLC):

- Non-construction costs
- Income
- Externalities

Life Cycle Cost (LCC):

- Construction
- Operation
- Maintenance
- Disposal and End of Life

4. DELIVERABLES:

One (1) deliverable submission of the LCC Analysis must be delivered in accordance with the NSFRV Build Contract CDRL.

DID T-000 Compliance Matrix

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Compliance Matrix.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-041 Construction Specification

3. PREPARATION INSTRUCTIONS:

Format:

The Compliance Matrix must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Compliance Matrix must be provided in Microsoft Excel format and as a searchable PDF for all versions including the final version.

Requirements:

The Compliance Matrix must identify the Objective Quality Evidence (OQE) for each specific requirement within the Design Specification in the form of a deliverable demonstrating that each requirement has been met. OQE are the deliverables that will be formally submitted to demonstrate compliance. In addition to the specific requirements within the Design Specification, the Compliance Matrix must also demonstrate compliance with the selected Regulatory Body Regime or Classification Society requirements.

The OQE may take the form of a drawing, calculation, or report called for in an existing DID or results of an inspection, test or trial. However, the existing DIDs should not be considered exhaustive. Where, in collaboration with Canada, the Contractor determines that additional OQE is required, the Contractor must produce and submit the additional OQE documentation.

The final Compliance Matrix must reflect the evolution of the technical requirements from the beginning of the Complete Design Development phase (1B) through to the final end vessel acceptance when all requirements are met.

Given that the Contractor will have provided a completed Compliance Matrix as an output of the Complete Design Development phase (1B) , updates to the Compliance Matrix may not be necessary after submission. However, if a requirement, or the method or means to meet a technical requirement has changed, the Compliance Matrix must be updated accordingly to reflect the change.

The Compliance Matrix will identify the agreed upon acceptance criteria, the identified verification method, event or document, and the final submitted OQE. Additionally, the Compliance Matrix must also capture the status of each proposed verification method (to demonstrate how a requirement will be met). Once the verification event has been successfully completed, the OQE submitted to CCG must be identified in the Compliance Matrix.

The Compliance Matrix must clearly include the following:

- a. A complete list of initial requirements as per the Design Specification at the beginning of the Production Engineering phase (1C)
- b. The verification methodology from the beginning to the end of the process (i.e. design deliverable, report, Inspection, FAT, Tests and Trials, etc.);
- c. The status of the verification (Criteria Accepted, OQE Identified, OQE Submitted, OQE Accepted); and
- d. An indication of successful completion of the identified verification method, as well as the identification of the OQE documentation (number, name, revision) that has been submitted to CCG.

4. DELIVERABLES:

One (1) electronic copy of the Compliance Matrix must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-001 Design Review Reports

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the development and presentation of the Design Review Reports.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PRESENTATION INSTRUCTIONS:

Format:

The Design Review Reports must be prepared in the Contractor's template and agreed to by Canada.

The Design Review Reports must be provided in Word format, and must additionally be provided as a searchable PDF.

Requirements:

The Contractor must, as a minimum, submit a Design Review Report for each major Ship Work Breakdown Structure (SWBS). With Canada's acceptance, the Contractor may provide more additional reports within each major SWBS Group if this would improve the Contractor's ability to clearly and thoroughly detail identified concerns.

The Design Review Reports must include the following:

- a. Be numbered in accordance with the Contractor's Technical Data Management Plan and include the relevant system's Ship Work Breakdown Structure (SWBS) Group and the document revision for ease of identification.
- b. An introductory section that presents the document number, identifies which systems the Design Review Report covers, the revision and revision date, the name and contract information of the author, a table of contents and a table of figures, including texts, graphs, formulas and calculations.
- c. Confirmation that the design complies with identified requirements (to a level commensurate with the scope of the technical baseline associated with the maturity level of the TDP) and, if not, an assessment of the design issue per

the sections below.

- d. Identify and detail design issues within the relevant systems, provide an outline on how to resolve the identified issues and recommending a timeframe to implement this solution.
- e. An appendix that includes a summary table of all identified design issues. The summary table must contain, but is not limited to, the following:
 - i. Type of Design Issue:
 - Design not in accordance with Classification Society rules
 - Design not in accordance with Regulatory requirements
 - Contradiction between design documents
 - Design intent and/or clarification required
 - Design package insufficient or requires further development
 - ii. Impact of Design Issue:
 - Minor Impact – defined as requiring minimal engineering effort to resolve, has no impact on the General Arrangement, the vessel's structural arrangement, system and sub-system specifications or primary and secondary equipment specifications.
 - Important Impact – defined as requiring moderate engineering effort to resolve, may impact non-structural bulkheads and secondary structure, as well as secondary equipment and sub-system specifications.
 - Major Impact – defined as requiring significant engineering effort to resolve, significant impact on the General Arrangement, vessel primary structure and system and primary equipment specifications.
 - iii. Timeline:
 - Must be resolved before Design Development Phase 1B
 - Can be resolved during Design Development Phase 1B

4. **DELIVERABLES:**

Design Check Review Meeting

One (1) electronic copy of the Contractor's Design Review Reports must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-005 Technical Baseline

1. PURPOSE of DID:

The purpose of this DID is to define the requirements of the Technical Baseline. The technical Baseline comprises all the design information that defines the vessel to be constructed and will be used to determine the compliance of the vessel once constructed.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-041 Construction Specification
DID T-078 Bill of Material

3. PREPARATION INSTRUCTIONS:

Format:

The Technical Baseline must be developed in the Contractor's own format

Requirements:

The Contractor must deliver a detailed listing of all technical documentation and drawings that define the vessel to be constructed. This list will include, at minimum:

- Design Specification in accordance with DID T-041 Construction Specification,
- All drawings, models and design information that define the design to be built,
- All Classification Society Approvals and Approved Drawings,
- The Bill of Material developed in accordance with DID T-078, and
- Ship 3D Product Model if it has been developed in accordance with the Contractor's own procedures

The list must contain the following information:

- Document name,
- Revision number,

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- Date of last revision, and
- Status of document

4. **Deliverables:**

One (1) electronic copy of the List, the completed documents and drawings must be delivered to Canada in accordance with the NSFRV Build Contract CDRL..

DID T-041 Construction Specification

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Near-Shore Fishery Research Vessel (NSFRV) Construction Specification.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-004 Cost Estimate
DID M-006 Configuration and Change Management Plan
DID T-005 Technical Baseline
DID T-078 Bill Of Material (BoM)

3. PREPARATION INSTRUCTIONS:

Format:

The Construction Specification must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Construction Specification must be presented in book form, including text and reference to all supporting calculations and drawings.

The Construction Specification must be provided in Microsoft suite formats and as a searchable PDF for all versions prior to the final version. The final version of the Design Specification must be provided in searchable PDF file(s).

Requirements:

The Contractor must provide a Construction Specification that is clear, concise, consistent and unambiguous.

The Construction Specification must be numbered using the same system as Contractor's Ship Work Breakdown Structure (SWBS) or with a system that is mutually agreeable to the Contractor and Canada.

The Construction Specification contains Canada's requirements for the NSFRV and as such must be updated throughout the contract in accordance with DID M-006 Configuration and Change Management Plan.

The Construction Specification must reflect the refinement of the NSFRV's design throughout the contract. These include, but are not limited to:

- a. All requirements must be updated to reflect the design as it matures;
- b. Additional requirements must be added to the Construction Specification where the design has progressed from the generic to a specific requirement or set of requirements;
- c. Where the Construction Specification uses the terms "or equivalent" or "or equal", the Contractor must replace these terms in the Specification and identify the Original Equipment Manufacturer and model number for all material and/or equipment selected by the Contractor;
- d. All references must be updated to reflect those used; and
- e. Additional references must be added to the Construction Specification where the design has matured or used new or different reference documentation.

The Construction Specification must contain the necessary information, and/or provide the necessary document references that describe the salient features of the Vessel to the level of detail required to support DID M-004 Cost Estimate, Classification Society Approvals and Approved Drawings, T-078 Bill of Material, and any design specific drawing, calculations and analyses conducted.

For each submission, the Construction Specification must show the date of export from the requirements management database. The Specification must list, for each requirement:

- a. Unique identifier;
- b. SWBS; and
- c. Requirement statement.

A revisions table must be appended to the Construction Specification and all changes from the previous submission must be highlighted within the document.

The Contractor may use the original Construction Specification wording unless this wording is insufficient to reasonably describe the requirements. Where new wording must be developed, the Contractor must describe the requirements using sentence structures and formatting consistent with the agreed to format.

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4. **DELIVERABLES:**

One (1) electronic copy of the Construction Specification must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-043 Margins Policy

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Margins Policy.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-020 Engineering Maturity Management Plan
DID T-096-1 Weight Report
DID T-096-2 Lightship Weight Estimate
DID T-325 Electrical Load Analysis
DID T-512 Heating, Ventilation, Air Conditioning (HVAC) Integrated System

3. PREPARATION INSTRUCTIONS:

Format:

The reports, plans, analysis and results must be presented in the Contractor's format and agreed to by Canada.

Requirements:

The Contractor must provide a summary overview of the following for the Margins Policy:

- a. Weight and VCG: Details of these are normally included in the weight report and lightship weight estimates; only a summary of the margins consumed and available is required herein;
- b. Electrical Margins including Propulsion: Details of these are normally included in the electrical load analysis; only a summary of the margins consumed and available is required herein;
- c. HVAC Margins: Details of these are normally included in the HVAC System Heating and Cooling Load Calculations; only a summary of the margins consumed and available is required herein; and

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In addition, the Contractor must provide the following information:

- a. Comments on any risks and/or opportunities associated with the margins, lack of consumption, too much consumption, etc.;
- b. Recommendations to mitigate any risks; and
- c. Recommendations to take advantage of any opportunities.

The Margins Policy must explicitly state how the Contractor intends to manage the following:

- a. How much margin will be applied based on design maturity;
- b. What level of fidelity will be used for the system/equipment base value, prior to margins being applied, based on design maturity (e.g. for weight – estimate, calculation, VFI, and extraction from the weighed weight);
- c. How the level of margins will be consumed as the design passes through an established phase or interim phase as defined by the approved DID M-020 Engineering Maturity Management Plan;
- d. How the referenced design deliverables will be updated and re-baselined based on these revised margins; and
- e. Unless specifically approved by Canada, how all design and construction margins will be consumed prior to the inclining experiment.*

*Note: any use of solid ballast in the NSFRV must be specifically discussed with and approved by Canada.

4. DELIVERABLES:

One (1) electronic copy of the Margins Policy must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-051 Fuel Endurance

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Fuel Endurance report and calculation(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-018 System Calculation Requirements
219-087 10150 Hydrodynamic Performance Calculations

3. PREPARATION INSTRUCTIONS:

Format:

The report and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Ship Performance:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

For the purpose of the report and calculations, the Contractor must utilize the following analyses and information:

- a. 219-087 10150 Hydrodynamic Performance Calculations

The Contractor must provide calculations demonstrating the expected range and endurance fuel requirements for the vessel relying on diesel generating sets only. The calculations must address actual fuel storage requirements citing fill level,

permeability, and unpumpable allowances, specific fuel consumptions, system losses worst case hotel loads and loading conditions detailed in reference.

Calculation must be done for following operations:

- a. Economical transit:
- b. Full power operation (Open water); and
- c. Full power operation (Trawl).

The Contractor must provide an analysis identifying the usage the energy storage system (ESS) to offset emissions / fuel consumption. For example, where a selected power requirement for the vessel may be achievable using a single prime mover plus the ESS, the duration of the activity is to be noted and the resultant delta in fuel consumption for that activity. This is applicable to full power operation or transits / operations requiring more than one generating set.

4. DELIVERABLES:

One (1) electronic copy of the Fuel Endurance report and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-073 Noise and Vibration

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Noise and Vibration report, calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, calculations and arrangement drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Noise and Vibration:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. System calculations in accordance with DID M-018 System Calculation Requirements; and

In addition to the report and calculations, the Contractor must provide the following information:

Design Review Phase

- a. A description of the procedures the Contractor will utilize to incorporate the noise requirements into the design and construction and to otherwise implement the noise control program;

- b. The analytical and engineering methods employed for noise control. This element must also identify the major documentation to be submitted by the Contractor throughout the program to substantiate the noise and vibration control designs and the selection of noise control treatments and materials.
- c. A schedule and procedures for noise control deliverables, design reviews and Tests. The participants (e.g. Contractor, Sub-contractor, OEM, etc.) in each design review must be identified.

Design Development Phase

- d. The following analysis, as well as any additional analysis the Contractor deems necessary to substantiate the noise and vibration controls must be submitted during detailed design:
 - i. Podded Propulsion Mounting;
 - ii. Airborne noise;
 - iii. Hull vibration;
 - iv. Resilient mount and foundation vibration design and analysis;
 - v. Sonar self-noise;
 - vi. Intermediate mass or masses (raft) of any compound mounting system analysis;
 - vii. Underwater radiated noise;
 - viii. Fluid system noise control analysis, including flow velocities, pressure drops, orifices, pressure reducing valves and rationale for establishing procurement noise criteria;
 - ix. Rotating machinery balancing procurement criteria; and
 - x. Determine which systems, machinery and equipment are noise critical and what silencing treatments are required to meet the noise requirements.
- e. Planned noise control testing methodologies, including a description of all expected factory and/or pre-installation Tests, post-installation Tests, surveys and trials.

4. DELIVERABLES:

One (1) electronic copy of the Noise and Vibration report, calculations, and arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-074 Welding Schedule

1. PURPOSE of DID:

The purpose of this DID is to identify to the contractor the requirements for the Welding Schedule.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The schedule must be provided in book form.

Requirements:

The Contractor must provide the following information for the Welding Schedule:

- a. A table listing details for all structural fillet welds; and
- b. Any other welding details as required by the appointed Classification Society's Rules.

4. DELIVERABLES:

One (1) electronic copy of the Welding schedule must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-078 Bill of Material

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Bill of Material (BoM).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-006 Configuration and Change Management Plan
DID T-000 Compliance Matrix

3. PREPARATION INSTRUCTIONS:

Format:

The BoM must be prepared in the Contractors format and agreed to by Canada.

The BoM must be provided as a Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version must be provided in both Microsoft Word and as a searchable PDF.

Requirements:

The Contractor must provide a clear, concise, consistent, and unambiguous BoM.

For all equipment in the BoM, the following information must be included:

- Make, model, and tracked serial number;
- Location onboard the vessel – Port, Starboard, etc.;
- TAG number on associated drawing;
- Equipment identifier or level number;
- Equipment nomenclature/description;
- Original Equipment Manufacturer (OEM) name
 - OEM model number;
 - OEM part number;

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- Weight (kg);
- Quantity; and
- Regulatory body approval.

The BoM is expected to mature throughout the conduct of the Work.

Alignment must be maintained between all relevant deliverables for each applicable DID as updates are made.

In addition, the deliverables in response to DID M-006 Configuration and Change Management Plan and DID T-000 Compliance Matrix must be aligned with the Construction specification and system drawings as updates are made.

The final BoM should reflect the as-built configuration of the Vessel.

4. DELIVERABLES:

One (1) electronic copy of the BoM must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-079 Stability Analysis

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Stability Analysis report, calculations and arrangement drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-018 System Calculation Requirements
DID M-019 Arrangement Drawing Requirements
219-087 Preliminary Stability Book R1
219-087 CCG Internal Stability Calculations R1

3. PREPARATION INSTRUCTIONS:

Format:

The report, calculations and arrangement drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Stability Analysis must be completed in accordance with Flag/Class criteria.

The Contractor must provide the following information for the Stability Analysis:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. System calculations in accordance with DID M-018 System Calculation Requirements; and
- c. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawings Requirements.

The Contractor must complete an ongoing Stability Analysis throughout design and construction. The analysis must include:

- a. A table of Principle Characteristics including:
 - i. Length (overall);
 - ii. Length (between perpendiculars);
 - iii. Beam;
 - iv. Depth (to freeboard deck);
 - v. Load Line Draft;
 - vi. Load Line Displacement;
 - vii. Lightship Draft;
 - viii. Lightship Displacement;
 - ix. Lightship VCG;
 - x. Lightship LCG;
 - xi. Lightship TCG;
 - xii. Ship's Complement;
- b. A table of Tank Capacities with centers of gravity for individual tanks and totals;
- c. Definition of applicable stability criteria;
- d. Hydrostatics and cross curves (KN) table;
- e. Ice accretion calculations;
- f. A plot of the maximum VCG required to meet both intact and damage stability criteria which includes all loading conditions and multiple maximum VCG curves for varying trim; and
- g. A table of all loading conditions assessed and a full description of each loading condition must be attached as an appendix and must include:
 - i. Summary of weight, VCG, LCG, and TCG;
 - ii. Free surface correction;
 - iii. Draft at LCF;
 - iv. GM – solid and corrected for free surface;
 - v. Heel;
 - vi. Trim;
 - vii. Draft at FP and AP.

All numerical data provided in the Stability Analysis must be presented in the following units:

- a. Length, draft, GCG, LCG, TCG – metres (m);
- b. All tank capacities – cubic metres (m³) and metric tonnes (MT);
- c. Dry cargo – metric tonnes (MT); and
- d. Liquid cargo – cubic metres (m³) and metric tonnes (MT).

In addition to the report, calculations and arrangement drawing(s), the Contractor must include, but is not limited to, the following analyses and information:

- a. Damage control analysis;
- b. Watertight Integrity analysis;
- c. Freeboard Plan;
- d. Load Line calculation; and
- e. Additional stability calculations outside the scope of the requisites for Flag/Class compliance:
 - i. TP10943 – Passenger Vessel Operations and Damaged Stability Standards.

The Stability Analysis must contain the following:

- a. Tabulated results of analyses and accompanying graphics, along with text containing any key background or contextual information;
- b. One (1) electronic copy of the computerized GHS model input run file and geometric file with all compartments and sail areas related to the development of the DID.

Thereafter, update must be provided with any major weight or center of gravity change.

4. DELIVERABLES:

One (1) electronic copy of the Stability Analysis report, calculations, and arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-096-1 Weight Report

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Weight Report.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID T-096-2 Lightship Weight Estimate
DID T-096-3 Weight Control Program

3. PREPARATION INSTRUCTIONS:

Format:

The Weight Report must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Weight Report must be provided in Microsoft suite formats and as a searchable PDF for all versions including the final version.

Requirements:

The Weight Report will be utilized as the primary communication tool to present weight and centers information for the vessel. It must summarize and provide commentary on the information found in DID T-096-2 Lightship Weight Estimate.

The Weight Reports must contain the following information including, but not limited to:

- a. An executive summary describing the current weight, centers of gravity, and status of margins. It should also highlight any active weight issues considered high risk;
- b. A summary table of the current weight estimate in 1-digit SWBS form;

- c. A table indicating the differences in weight in the current weight estimate from the previously submitted version for each SWBS group;
- d. A summary of updates made to the weight estimate since the previous revision, along with a commentary on the impacts of these updates;
- e. A graph indicating the total lightship weight trend, including Beginning of Service Life (BOSL) and End of Service Life (EOSL) conditions, both with and without margin;
- f. A graph indicating the weight trend for each 1-digit SWBS section, including BOSL and EOSL conditions, both with and without margins;
- g. A graph indicating the Vertical Centre of Gravity (VCG), Longitudinal Centre of Gravity (LCG) and Transverse Centre of Gravity (TCG) trends, including BOSL and EOSL conditions, both with and without margins;
- h. A summary of margins, including a table indicating the remaining margin per SWBS section;
- i. A summary of all updated loading conditions;
- j. The minimum GM curve that includes all stability conditions;
- k. Conclusions and recommendations; and
- l. DID T-096-2 Lightship Weight Estimate as an appendix.

4. DELIVERABLES:

One (1) electronic copy of the Weight Report must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-096-2 Lightship Weight Estimate

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Lightship Weight Estimate.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-018 System Calculation Requirements
DID T-096-1 Weight Report
DID T-096-3 Weight Control Program

3. PREPARATION INSTRUCTIONS:

Format:

The calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Additionally, the Lightship Weight Estimate spreadsheet containing the raw weight data and calculations must be provided in Excel format.

Requirements:

The Contractor must provide the following information for the Lightship Weight Estimate:

- a. System calculations in accordance with DID M-018 System Calculation Requirements.

The Lightship Weight Estimate must contain the following information:

- a. A complete material take off of vessel structure;
- b. A complete line-by-line review and update of vessel equipment (SWBS 200-600);
- c. A review and update of assumptions made on unit weights (cabling, insulation, joinery, etc.); and

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- d. An update to reflect shipyard practices and standards.

The Lightship Weight Estimate must be updated continually and submitted to Canada as per DID T-096-1 Weight Report.

The Lightship Weight Estimate must have a detailed itemized breakdown in accordance with the Contractor's SWBS. Each item in the weight estimate must include, at a minimum:

- a. The applicable SWBS number;
- b. A description, including make and model number (if applicable);
- c. The last revision number the item was updated on;
- d. The source of information, indicating each item as either estimated, calculated, vendor supplied, weighed, etc.;
- e. Number of each item present on the vessel;
- f. Measurement, if applicable;
- g. Unit weight;
- h. Weight; and
- i. Centers of gravity in reference to the origin of the vessel as indicated.

The Lightship Weight Estimate must include a summary page indicating the subtotal of each 1-digit SWBS group, the overall weight and center of gravity of the vessel, as well as a summary of margins.

As Vendor Furnished Information (VFI) is provided to the Contractor, it must be submitted to Canada in the next revision of the Lightship Weight Estimate.

4. DELIVERABLES:

One (1) electronic copy of the Lightship Weight Estimate must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-096-3 Weight Control Program

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Weight Control Program.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID T-096-1 Weight Report
DID T-096-2 Lightship Weight Estimate

3. PREPARATION INSTRUCTIONS:

Format:

The Weight Control Program must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Weight Control Program must be provided in Microsoft suite formats and as a searchable PDF for all versions including the final version.

Requirements:

The Contractor must provide the following information for the Weight Control Program:

- a. A report in accordance with DID M-016 System Report Requirements

The Contractor must develop and implement a weight control program for the NSFRV throughout construction, outfit, trials and delivery. The program must include a description of the Contractor's procedures for determining weights and controlling weight growth.

The Weight Control Program must include the following topics:

- a. The Contractor's evaluation of the condition of the design with respect to

- the NSFRV's performance characteristics, the type of weight control, and where emphasis on weight control is to be applied;
- b. The degree of weighing planned for outfitting and samples;
- c. A discussion of anticipated weight problems and proposed solutions;
- d. The planned action for verification of mill tolerances, welding, and paint factor;
- e. The management of weight margins and allowances;
- f. The action which will be taken upon detection of weight or moment trends which will affect vessel performance;
- g. The method and degree of weight control that will be required of vendors; and,
- h. Proposals for maintaining or reducing weights from those in the weight report.

The Contractor must, in their procurement documents, require vendors to submit information on the net weight and location of the center of gravity if all major assemblies, equipment, fittings or components to be installed on the NSFRV. The weights of the material must be confirmed by the Contractor. The weighing program must include:

- a. Steel plates and shapes to determine mill tolerances;
- b. Material, structures, and components on a selective or sampling basis to verify actual weights;
- c. Insulation, sheathing, piping, paint, welding, etc., to obtain reliable unit weights;
- d. Vendor supplied components for verification of weights supplied by vendors; and,
- e. Items requested by Canada and agreed to by the Contractor.

Until the NSFRV is accepted by Canada, the Contractor must continuously monitor the weight.

The Contractor must physically weigh the NSFRV prior to delivery and provide the results as part of the weight report to Canada.

4. DELIVERABLES:

One (1) electronic copy of the Weight Control Program must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-171 Mast Structure and Analysis

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Mast Structure report and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report and drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirement:

The Contractor must provide the following information for the Mast Structure:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements.

The system report and system drawing(s) must specify and detail the arrangement and scantlings of the mast structure.

The system report must detail the structural analysis undertaken to devise the mast structure. A Finite Element Analysis (FEA) is required for the structural analysis. The FEA suite must be an industry recognized and/or class approved suite. The FEA must include and detail:

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For the FEA Model:

- a) Model geometry
- b) Model boundary conditions
- c) Model element and material properties

For the FEA strength Analysis:

- a) Mast Loading, including but not limited to environmental (wind and ice accretion), ship motions, mounted equipment and structural self-weight
- b) The utilized Load cases
- c) The resultant stresses and deflections

A recognized and class approved analysis methodology on deck structures and equipment, such as the Lloyd's Register Rules and Regulations, Code for Lifting Appliances in a Marine Environment or equivalent is required to guide the analysis.

4. DELIVERABLES:

One (1) electronic copy of the Mast Structure report and drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-200 Torsion Vibration Analyses

1. PURPOSE of DID:

The purpose of this DID is to define the requirements for the Torsion Vibration Analyses.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Torsion Vibration Analyses Must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The results of the Torsion Vibration Analysis must be presented in book form, including text, graphs and supporting calculations. All input data must be provided electronically with the results.

The Torsion Vibration Analysis must be provided in Microsoft Excel format and as a searchable PDF for all versions including the final version.

Requirements:

The deliverable must contain:

- a. The results of the torsion vibration analyses for the diesel generators and the combination of the propulsion motors and the azimuthing thrusters;
- b. In the event that the analyses disclose excessive stresses, or barred speed ranges within normal operating speeds, alternative configurations or equipment to bring results to acceptable values must be presented in this deliverable;
- c. A described propulsion system without any barred speeds within the operating speed range;
- d. written approval of analysis results from all propulsion equipment suppliers and from Class;
- e. copies of approvals in the final analysis reports;

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- f. analysis reports for review by the Technical Authority, and update analyses and reports to incorporate any comments or recommendations; and
- g. copy of final analysis reports to the Technical Authority, and include copies in the equipment operating manuals or alternate location(s) as directed by the Technical Authority.

4. **DELIVERABLES:**

One (1) electronic copy of the Torsion Vibration Analysis, including text, drawings, tabulated results of analysis and all supporting data used in the development of this booklet must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-201 Main Machinery Arrangements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Main Machinery Arrangements drawings.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements
DID T-301 Electrical Equipment Arrangements

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DID referenced in Section 2 above.

3D files to be delivered in Rhino 6 or NAPA format. Other file formats can be submitted to CCG for approval prior to use.

Requirements:

The Contractor must provide the following information for the Main Machinery Arrangements:

- a. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

The arrangement of the vessel's main machinery spaces must be determined in consultation with Canada to ensure that the requirements are complied with.

The Contractor must develop and maintain plan, elevation, and section view drawings and 3-dimensional model(s) for the vessel that clearly shows the vessel's main machinery spaces as the work progresses through increasing maturity. The drawings must include, but are not limited to:

- a. Engine room;
- b. Propulsion compartment; and
- c. Intake and exhaust casing;

The drawing(s) and/or model(s) must include all major and significant machinery as well as features of the space commensurate with the level of design detail available. The drawing(s) and models must demonstrate how the arrangement complies with the original equipment manufacturer's specifications, Contract Specifications, international conventions, statutory regulations, and Classification Society requirements.

In addition to the information required by DID M-019 Arrangement Drawings Requirements, the Contractor must provide the following information on the Main Machinery Arrangement equipment including, but not limited to:

- a. Propulsion machinery:
 - i. Diesel generators;
 - ii. Motors;
 - iii. Variable frequency drives;
 - iv. Propulsors;
 - v. Gearbox(es); and
 - vi. Shafting.
- b. Gyro stabilizing units;
- c. Purifier / Fuel Handling equipment;
- d. Intakes and uptakes, exhaust selective catalytic reducers and silencers;
- e. Main and Propulsion Switchboards;
- f. Transformers, and switchgear;
- g. Air conditioning units / Chillers;
- h. All major pumps, motors, heat exchangers, condensers, compressors, large strainers and air receivers;
- i. Main vent ducts outlined;
- j. Local Control Stations and Alarm Panels;
- k. Sea chest/seabay cross main piping;
- l. Valve-manifolds;
- m. Platforms and ladders;
- n. All service tanks and loose tanks; and
- o. Total flood fire suppression system agent storage if located within any of the spaces identified above.

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4. DELIVERABLES:

One (1) electronic copy of the Main Machinery Arrangements drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-204 Engine/Generator Solid Body Dynamic Analysis

1. PURPOSE of DID:

The purpose of this DID is to define the requirements of the Engine/Generator Solid Body Dynamic Analysis report.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Engine/Generator Solid Body Dynamic Analysis report must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The results of the Engine/Generator Solid Body Dynamic Analysis must be presented in book form, including text, graphs and supporting calculations. All input data must be provided electronically with the results.

The Engine/Generator Solid Body Dynamic Analysis must be provided in Microsoft Excel format and as a searchable PDF for all versions including the final version.

Requirements:

The content of this deliverable must include a solid body dynamic analysis of the diesel generator mounting system to verify there will be no critical speeds over the operating range. The analysis must determine the natural frequencies of vibration-isolated equipment in all 6 degrees of freedom, plus couple modes where appropriate and evaluate critical speeds where significant engine or electrical load generated excitation may excite the natural frequencies of the isolated equipment.

Where applicable, the analysis must include stiffness characteristics of couplings and shafts and demonstrate that the displacements expected at crankshaft, shaft coupling, and all piping connections (cooling, fuel, air, exhaust) due to changes in torque reaction forces between no load and full load, combined with movements due to sea state conditions (corresponding to the design environmental conditions specified in the NSFRV Construction Specification), are within the capabilities of the shaft coupling and of all flexible connections; and that forces transmitted to the

engine crankshaft, and turbochargers due to these displacements are within the limits established by the engine manufacturer.

The analysis report must include design calculations, drawings, and manufacturers' literature on isolation mounts, flexible coupling, and flexible connections. Specifically, the analysis report must include, but not necessarily be limited to:

- a. Frequencies of disturbing forces and moments for the engine and generator;
- b. Static and dynamic stiffness characteristics of all vibration isolators and shaft coupling predicted natural frequencies for the isolated system;
- c. Loading on individual isolators and isolator rated capacities;
- d. Predicted steady-state deflections at exhaust flanges, and other flexible connection points due to torque reaction forces and design sea states; and
- e. Drawings indicating isolator locations and the nature of support required beneath each isolator, and predicted creep-over time in case of elastomeric isolators.

4. DELIVERABLES:

One (1) electronic copy of the Engine/Generator Solid Body Dynamic Analysis, including text, drawings, tabulated results of analysis and all supporting data used in the development of this booklet must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-207 Propeller Design Report and Drawing Package

1. PURPOSE of DID:

The purpose of this DID is to describe the requirements for the Propeller Test Reports and Design Package.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report and drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

The Propeller Test Reports and Design Package must be provided in Microsoft Office Suite format – Word and/or Excel as applicable – and as a searchable PDF for all versions including the final version.

The reports must be presented in book form, including text, graphs and supporting calculations. All input data must be provided electronically with the results (see Deliverables).

Requirements:

The Contractor must provide the following information for the Propeller Design Report and Drawing Package:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements.
- c. A system calculations in accordance with DID M-018 System Calculations Requirements.

In addition, the Propeller Design Report must detail the rationale for all design deviations and report the effects of these deviations on propulsor efficiency, cavitation, and acoustic and hydrodynamic performance.

The report must include any associated calculations, studies, analyses, hydrodynamic model testing, and engineering data developed by the Contractor in support of the design.

The Propeller Design Report must detail the following:

- a. Cavitation inception speeds; Thrust coefficient (KT) and torque coefficient (KQ) versus advance coefficient(J) curves for the propeller;
- b. Propeller torque, power, and efficiencies over the full speed range of the propulsion system; and
- c. Propeller thrust and Vessel resistance versus vessel speed over the full speed range of the propulsion system.

Detailed drawings of the propellers clearly showing all relevant dimensions including, as a minimum:

- a. Blade side elevation, transverse, expanded blade and pitch diagram views; Propeller and propeller hub diameter;
- b. Pitch and pitch ratio;
- c. Disk Area, developed area, and area ratio;
- d. Blade projected area and projected area ratio;
- e. Skew and rake;
- f. Blade sections at intervals of at least 0.1R; Offset; and
- g. Tolerances.

The Propeller Design Report and drawings must include the information required for inspection, repair, and manufacture of the propellers. The final report must include verification inspection and test data for the propellers that are delivered to Canada.

4. DELIVERABLES:

One (1) electronic copy of the Propeller Design Reports and Drawing Package. (including text, drawings, tabulated results of analysis and all supporting data) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-208 Propulsion System Alignment

1. PURPOSE of DID:

The purpose of this DID is to describe the requirements for the Propulsion System Alignment booklet

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Propulsion System Alignment booklet must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Propulsion System Alignment booklet must be provided in Microsoft Office Suite format – Word or Excel as applicable – and as a searchable PDF for all versions including the final version.

The reports must be presented in book form, including text, graphs and supporting calculations. All input data must be provided electronically with the results (see Deliverables).

Requirements:

A propulsion system alignment booklet must be prepared prior to commencing installation. This booklet must contain, but not be limited to, the following:

- a. All alignment criteria (for example, tolerance values and limit values) that must be checked to confirm proper alignment of the propulsion system.
- b. Manufacturers' data applicable to alignment and related calculations.
- c. Alignment procedures detailing the procedures to be used for all components of the shafting and reduction gear to ensure that the alignment criteria will be met. Data sheets and other forms to be used during the alignment and validation proceedings shall be appended, and
- d. All initial bearing clearance must be record including tolerance and limit values.

After the final alignment has been completed, the propulsion system alignment booklet must be revised to include the as-measured hot and cold bearing loads (see below).

Cold Alignment Check

Machinery alignments must be measured in the cold condition to the extent that assurance can be given prior to sea trials that resulting hot alignment will meet the alignment criteria. Adjustments must be made as necessary to achieve that assurance.

Hot Alignment Check

Machinery alignments must be measured with the thruster machinery room foundations and machinery are up to operating temperature, such as while undergoing or immediately upon returning from underway sea trials.

4. DELIVERABLES:

One (1) electronic copy of the Propulsion System Alignment booklet (including text, drawings, tabulated results of analysis and all supporting data) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-235 Electric Propulsion System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Electric Propulsion System report, drawing(s), and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements
DID T-245 Azimuthing Thrusters
DID T-300 Hybrid Electric Power Generation and Distribution Systems

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Electric Propulsion System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

The drawing(s) and calculations must include, but are not limited to, the following information:

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- a. Propulsion generators (including the diesel engines);
- b. Propulsion energy storage system (PESS)
- c. Propulsion motors or podded propulsion motors; and
- d. Propulsion motor drives.

4. DELIVERABLES:

One (1) electronic copy of the Electric Propulsion System report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T - 245 Azimuthing Thrusters

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Azimuthing Thrusters report, drawing(s), and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s), and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Azimuthing Thrusters:

- a. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Azimuthing Thrusters drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-256 Seawater Cooling System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Seawater Cooling System drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Seawater Cooling System:

- a. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Seawater Cooling System drawing(s) and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-259 Intakes and Exhaust System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Intakes and Exhaust System report, drawing and calculations for Contract Design.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing and calculations must be provided as indicated in the reference DIDs in section 2 above.

Requirements:

The contractor shall provide the following information for the Intakes and Exhaust System:

- a. A system report in accordance with DID M-16 System Report Requirements;
- b. A system drawing in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of each system report, drawing, and calculation are to be delivered in accordance with the NSFRV Build CDRL.

DID T-291 Selective Catalytic Reduction (SCR) and Diesel Exhaust Fluid (DEF) Systems

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Selective Catalytic Reduction (SCR) and Diesel Exhaust Fluid (DEF) Systems report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the SCR and DEF systems:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

In addition to the report, drawing(s) and calculations, the Contractor must provide the following information:

Drawing(s):

- a. DEF design concentration.

Calculations:

- a. Calculations and assumptions used to size the SCR and DEF equipment and storage tank(s) to meet Class requirements and guidance;
- b. Calculations and assumptions used to size the SCR and DEF equipment and storage tank(s) to meet OEM requirements and guidance;
- c. Calculations and assumptions used to size the SCR and DEF equipment and storage tank(s) to meet the requirements and guidance of any used standard (ex. ISO, SNAME, etc.);
- d. DEF storage volume and anticipated range must be calculated using the same scenarios as the Fuel Endurance calculations. The DEF consumption value(s) used must also be identified; and
- e. A summary and associated datasheets for the system components (ex. Transfer Unit(s), Dosing Unit(s), Clean Emission Module(s), valves, gauges, etc.). Details are to include weight, dimensions, maintenance area requirements, and any interface requirements.

4. DELIVERABLES:

One (1) electronic copy of the Selective Catalytic Reduction and Diesel Exhaust Fluid Systems report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-300 Hybrid Electric Power Generation and Distribution Systems

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Hybrid Electric Power Generation and Distribution Systems Report.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID T-235 Electric Propulsion System
DID T-301 Electrical Equipment Arrangement
DID T-325 Electrical Load Analysis
DID T-326 Electrical Single Line Diagrams
DID T-327 Power Management System
DID T-328 Fault Current Analysis

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Electrical Power Distribution Systems:

- a. A system report in accordance with DID M-016 System Report Requirements;

The report must describe the hybrid electric power generation and distribution systems onboard the NSFRV and at a minimum describe all sections below:

1. The Contractor must include information on the equipment listed below. All equipment must be rationalized and described in accordance with other applicable deliverables (ELA, SLD, PMS, EEA, Short Circuit Analysis etc.):

- a. Generators, Emergency Generators, and ESS
- b. Propulsion Motors
- c. Harmonic filters
- d. Cable types
- e. Motor starter panels
- f. Semiconductor converters and VFDs
- g. Switchboards, section boards, distribution boards and panels
- h. Transformers
- i. UPS and DC Rectifiers
- j. Ship Service Batteries
- k. Receptacles including working deck kiosks
- l. Shore power equipment

2. The Contractor must provide:

- a. Description of all system voltages and grounding methods (HRG, ungrounded, solidly grounded etc) and rationale to support voltage levels used and grounding methods selected
- b. Discussion of future growth allowances and how these will be met including but not limited to: Main power sources, distribution equipment, and cable trays
- c. Analysis and description of expected vessel operating profiles in line with DID T-327 Power Management System
- d. Description of operational limitations
- e. Description of energy flows in accordance LR, Pt 6, Ch 2, 24.23 Power system development and integration - Energy flows
- f. Description of safety functions in accordance LR, Pt 6, Ch 2, 24.25 Power system development and integration - Safety functions
- g. Power system analysis in accordance LR, Pt 6, Ch 2, 24.24 Power system development and integration - Power system analysis
- h. Contractor's recommendations for optimizations and changes based on equipment selection, equipment commonality, application of the rules and regulations, as well as track any changes and their effects on other systems
- i. Additional innovative features that would improve the design of the NSFRV if applicable
- j. Any other analysis, calculations, data or otherwise not mentioned in this DID that was used as a basis for any aspect of the design of the Hybrid Electric Power Generation and Distribution System must be made available to CCG at the time of transmittal.

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The Report must track any changes and their effects on the systems as the design progresses.

Naming conventions and labels for all electrical components must be consistent across all deliverables.

4.DELIVERABLES:

One (1) electronic copy of the Hybrid Electric Power Generation and Distribution Systems report must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T - 301 Electrical Equipment Arrangements (EEA)

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Electrical Equipment Arrangement (EEA) drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements
DID T-201 Main Machinery Arrangements
DID T-300 Hybrid Electric Power Generation and Distribution System
DID T-302 Electrical Equipment - IP Ratings
DID T-326 Electrical Single Line Diagram

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DID referenced in Section 2 above.

3D files to be delivered in Rhino 6 or NAPA format. Other file formats can be submitted to CCG for approval prior to use.

Requirements:

The Contractor must provide the following information for the EEA:

- a. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

The Contractor must develop and maintain plan, elevation, and section view drawings and 3D model(s) for the vessel that clearly show the vessel's electrical equipment spaces as the work progresses through increasing maturity. The drawing(s) must include, but is not limited to:

- a. Switchboard room;
- b. Port and starboard battery compartments;
- c. Electronic equipment rooms; and
- d. Propulsion compartment.

The Contractor must provide a drawing(s) with a list of major and significant equipment, including:

- a. All major pieces of electrical equipment (panels, switchboards, transformers, Variable Frequency Drive (VFD), control panels, starters and Motor Control Centers (MCC), generators, Energy Storage Systems (ESS batteries, SS batteries, UPSs), ESS converters, equipment for generation, distribution, and grounding of electrical power;
- b. Electrical components servicing the electric propulsion system;
- c. MCC, Local Group Starter Panels (LGSP) and individual motor starters panels;
- d. The Ship Control and Monitoring System (SCMS); and
- e. Emergency control panels and switches.

Starter panels that come pre-packaged on skid equipment do not need to be labelled on the electrical equipment arrangement; however, any additional external starter panels provided with skid equipment will be shown on the arrangement.

The EEA must convey the spatial and maintenance requirements of all Major and Significant pieces of electrical equipment. The EEA drawing(s) must include:

- a. Identifiers for each piece of equipment with an appropriate labeling system;
- b. First or last page must include a table with the following information:
 - i. Equipment identifier;
 - ii. Equipment description;
 - iii. Equipment mounting method (flush/surface);
 - iv. Equipment IP rating;
 - v. Make and model number of the equipment;
 - vi. Dimensions of equipment (length, width and height);
 - vii. Weight of the equipment;
 - viii. Cable entry (specify top, bottom and sides requiring cable penetrations); and
 - ix. Mounting of equipment (deck, bulkhead, skid etc.)
- c. The maintenance and access requirements for each piece of equipment in accordance with the manufacturer's recommendations.

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All equipment clearance dimensions, maintenance, and access requirements governed by Classification Society or Statutory rules:

- a. Hashed/dotted lines to illustrate maintenance and access envelopes;
- b. Any critical clearances as determined by the designer to ensure the arrangement is functional; and
- c. Any elevation views in each compartment arrangement drawing, including all electrical equipment within the space.

4. DELIVERABLES:

One (1) electronic copy of the EEA arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-302 Electrical Equipment – IP Ratings

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Electrical Equipment – IP Ratings.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID T-201 Main Machinery Arrangement
DID T-301 Electrical Equipment Arrangement
IEC International Electrotechnical Commission Standard 60529
IEC International Electrotechnical Commission Standard 60092-201
UL 50 Enclosures for Electrical Equipment 2015

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Electrical Equipment – IP Ratings:

- a. A system report in accordance with DID M-016 System Report Requirements;

In addition to the report and drawing(s), the Contractor must provide the following information:

- a. A recommended IP rating for all equipment based on location of equipment for protection of personnel and equipment from hazards of corrosion, water ingress or arc flash events;

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- b. A table with all compartments shown on DID T-201 Main Machinery Arrangement and DID T-301 Electrical Equipment Arrangement, including an IP rating that meets IEC Standard 60529 and Class standards;
- c. Corrosion protection of exposed electrical equipment in accordance with IEC Standard 60529 as well as UL 50; and
- d. Any drawings and calculations associated with the products of this DID.

4. DELIVERABLES:

One (1) electronic copy of the Electrical Equipment – IP Ratings report, drawing(s) and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-303 Coordination Analysis

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the development and presentation of the Short Circuit Coordination Analysis and to ensure proper sequencing of the circuit breakers during a fault for both the AC and DC electrical distribution systems.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements
DID T-300 Hybrid Electric Power Generation and Distribution Systems
DID T-325 Electrical Load Analysis
DID T-326 Electrical Single Line Diagram
DID T-328 Fault Current Analysis

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Protective Devices:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

An approved Circuit Breaker Coordination Analysis must be provided by the builder or manufacturer and is to include timing curves for the selected circuit breakers to ensure the proper sequencing during a fault.

In addition to the report, drawing and calculations, the Contractor must provide the following information:

- a. The analysis must address proper circuit breaker coordination for the electrical system:
 - I. with the worst case electrical load plant loading with all main sources of power online as calculated in DID T-328 Fault Current Analysis and T-325 Electrical Load Analysis; and,
 - II. for power generating, propulsion, thruster, steering and auxiliaries, bus-tie and other essential services defined by LR Rules and Regulations.
- b. A schematic impedance diagram indicating all estimated impedance values used in the calculation of fault currents. Impedance must be provided for all major circuit elements, including generation, transformers, converters, battery banks/UPS, switchboards and conductors
- c. A summary table is to be included which lists all circuit breakers with the recommended timings.

The Report, Calculations, and Drawing deliverables must track any changes and their effects on the systems as the design progresses.

Naming conventions and label for all electrical components must be consistent across all deliverables.

4. DELIVERABLES:

One (1) electronic copy of the Short Circuit Coordination Analysis report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-304 Electrical Cables and Cable Installation

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Electrical Cables and Cable Installation report, drawing(s), and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements
DID T-301 Electrical Equipment Arrangement
DID T-326 Electrical Single Line Diagram
DID T-405 Mast and Antenna Arrangements
DID T-420 Navigation Systems
DID T-512 Heating, Ventilation, Air Conditioning (HVAC)
DID T-601 General Arrangement

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Electrical Cables and Cable Installation:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

The Cable Tray Arrangement drawing must be aligned with and developed in conjunction with the DID T-301 Electrical Equipment Arrangement Drawing and DID T-512 Heating, Ventilation, Air Conditioning (HVAC) to avoid interferences between systems. The Cable Tray Arrangement drawing must be overlaid on the latest version of the General Arrangement (GA) as defined by DID T-601 General Arrangement. The GA must be set as the base layer, with all cable trays shown on separate layers in accordance with Contractor's drafting standards.

In addition to the report, drawing(s) and calculations, the Contractor must provide the following information:

- a. A Cable Schedule including:
 - i. A list of all distribution cables that for the electrical distribution (high and low voltage) as well as all communication and data cables;
 - ii. The type of conductor/cables used;
 - iii. The length of conductor/cables;
 - iv. The voltage drop calculations for the conductors/cables;
 - v. The cable Category based on IEC 60533 used for cable separation required to mitigate Electromagnetic Interference (EMI);
 - vi. The "Equipment From" ID and the compartment from when the cable originates;
 - vii. The "Equipment To" ID and the compartment in which the cable terminates;
 - viii. Cable number and cable type; and
 - ix. Cable segregation code.
- b. Cable Node Plan in accordance with DID M-017 System Drawing Requirements.

The Electrical Cables and Cable Installation must be provided in a report format, and as an MS Excel file with all capacity data and fill percentages, both exported directly from the Contractor's cable management software.

For the purpose of the report, the Contractor must highlight and discuss the design rationale and associated risks of any areas of high cable density or choke points. Specifically, the following areas must be addressed:

- a. Vertical trunks - provide evidence that there is sufficient space for electrical cables, sufficient cable separation, and there is no interference with other services installed in the trunk (HVAC, piping, etc.);

- b. Server and electronics rooms - provide evidence that the design has considered the quantity of data and power cables in and out of these spaces;
- c. Mast - provide evidence there is proper cable separation and consideration for the routing of cables supply data and communications for radiating and receiving equipment;
- d. Areas of high risk of EMI - the sources of high EMR must be identified and a solution for cable routing to minimize EMI must be presented;
- e. Regulatory standards of cable segregation and spacing requirements;
- f. A discussion on cable access and maintenance; and
- g. A discussion of how the arrangement meets regulatory and class spacing requirements.

The drawing(s) must:

- a. Be an engineered drawing locating all the electrical cable trays for power distribution and communications/data systems;
- b. Route the cable trays on the most recent version of the GA drawing;
- c. Show all primary electrical cable tray for power distribution, and communications/data, with power distribution and data cables shown on different layers;
- d. Indicate the dimensions and type of cable trays used (width and height available for cables);
- e. Indicate the size and type of penetrations required;
- f. Include a table on the first sheet of the drawing package specifying the capacity of the cable trays based on the Rules and Regulations. For the power distribution cable trays, the quantity of cables in each section of cable tray is to be shown, including the amount of spare capacity left in each section of cable tray; and
- g. Define all cable tray and penetration types, including dimensions and part numbers.

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4. DELIVERABLES:

One (1) electronic copy of the Electrical Cables and Cable Installation report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-305 Receptacles Arrangement

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the development and presentation of the Electrical Receptacle Arrangement.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID T-601 General Arrangement

3. PREPARATION INSTRUCTIONS:

Format:

The report and drawing shall be provided as indicated in the reference DIDs.

Definitions:

Fixed Receptacle:

Fixed receptacles provide a dedicated interface to the ship's electrical system for any portable or semi-portable equipment that,

- comes standard with an electrical plug (rather than fly lead); and,
- is installed on the ship in a prescribed location.

Fixed receptacles have a dedicated circuit breaker that is not shared with any other circuit. These items do not factor into the calculation of growth allowance for the electrical system.

Convenience Receptacle:

Receptacles that are not dedicated to any particular system/equipment on the ship. These receptacles are for general use, and will be grouped together onto circuits in accordance with applicable standards. These receptacles must be factored when considering the required growth allowances.

Requirements:

The contractor shall provide the following information for the receptacles:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements.

In the drawing, the Contractor must provide the information on:

- a. The locations of all convenience and fixed receptacles on the Vessel including receptacles of all voltage levels and if they have UPS capability. Convenience and dedicated receptacles must be provided on different drawing layers and receptacles required for mission equipment brought on board must be included.
- b. The receptacle layout in each compartment must be reviewed in conjunction with deliverables T-601 and the Outfitting Plan Drawings.
- c. Identify relative mounting heights of all receptacles
- d. Be overlaid on the latest revision the general arrangement
- e. Include an Equipment Schedule on the first or last page with the following information:
 - i. Equipment ID
 - ii. Equipment Description
 - iii. Type and Part Number of the Equipment
 - iv. Mounting of Equipment (surface, recessed etc)
 - v. Ingress Protection (IP) rating in accordance with DID T-302

4. DELIVERABLES:

One (1) electronic copy of Electrical Receptacle Arrangement systems analysis report and drawing(s) is to be delivered in accordance with the NSFRV Build CDRL.

DID T-310 Power Quality and Total Harmonic Distortion

1. PURPOSE of DID:

The purpose of this DID is to provide an analysis of power quality in order to estimate the total harmonic distortion (THD) that will be observed on the electrical power system and the quality of the DC system. The analysis will provide the objective quality evidence to demonstrate that the system meets the requirements of the Construction Specification and Class Rules. The analysis will identify any need for additional filters or power quality improving devices.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-018 System Calculation Requirements
DID T-325 Electrical Load Analysis
LR, Rules and Regulations for the Classification of Ships, 2021

3. PREPARATION INSTRUCTIONS:

Format:

The report and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Power quality and total harmonic distortion:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

A harmonic analysis must be performed to demonstrate THD and power quality compliance. This study must address THD and power quality considering the following pieces of equipment:

- a. Main Propulsion VFDs
- b. Bow Thruster VFD
- c. Winch VFDs
- d. ESS Chargers/Converters
- e. All VFDs driving motors larger than 3kW
- f. Uninterruptible power supplies
- g. DC rectifiers
- h. Lumped lighting load
- i. Lumped electronics load

The analysis must investigate the total harmonic distortion and power quality based on four operating scenarios:

1. In transit in the open water in accordance with “Maximum Speed” scenario in DID T-325,
 - a. No battery charging
 - b. Propulsion motors for maximum speed (>10.5 knots)
 - c. No deck machinery
 - d. VFDs driving equipment loaded in accordance with ELA scenario
 - e. Uninterruptible power supplies and DC rectifiers loaded in accordance with ELA scenario
2. In transit while conducting science missions in accordance with the “Economic Cruise Summer Day” scenario in the ELA.
 - a. Charge batteries, if generator load below 75% MCR
 - b. Propulsion motors for cruising speed (9 knots)
 - c. Bow Thruster VFD at 0% output
 - d. No deck machinery
 - e. VFDs driving equipment loaded in accordance with ELA scenario
 - f. Uninterruptible power supplies and DC rectifiers loaded in accordance with ELA scenario

3. Station Keeping in worst case sea state in accordance with the “Fishing (Deploy Trawl Nets)” scenario in the ELA,
 - a. Charge batteries, if generator load below 75% MCR
 - b. Propulsion motors for trawling speed
 - c. Trawl Winch regenerative braking
 - d. VFDs driving equipment loaded in accordance with ELA scenario
 - e. Uninterruptible power supplies and DC rectifiers loaded in accordance with ELA scenario
4. Station Keeping in worst case sea state in accordance with the “Fishing (Recover Trawl Net)” scenario in the ELA,
 - a. Charge batteries, if generator load below 75% MCR
 - b. Propulsion motors for trawling speed
 - c. Trawl winches at 100%
 - d. VFDs driving equipment loaded in accordance with ELA scenario
 - e. Uninterruptible power supplies and DC rectifiers loaded in accordance with ELA scenario

THD must be calculated at all switchboard buses with all frequencies up to 100 times of the supply frequency in accordance with ABS, *Guidance Notes on Control of Harmonics in Electrical Power Systems*, 2006;

The total harmonic distortion and maximum single harmonics must be calculated to verify that the system is expected to operate within the harmonic limits specified in the DIG section 301 and Classification rules

If the harmonic level exceeds the specified limits, the Contractor shall provide recommendations for size and placement of harmonic filters. These filters must be incorporated into the calculation and design to ensure the levels are within limits.

The power quality of the DC systems must comply with power quality limits specified in the DIG section 301 and Classification rules. When supplied by batteries, different voltage variations as determined by the charging/discharging characteristics, including ripple voltage from the charging device, may be considered. When battery chargers/battery combinations are used as DC power supply systems adequate measures are to be taken to keep the voltage within the specified limits during charging, boost charging and discharging of the battery.

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4. DELIVERABLES:

One (1) electronic copy of the Power Quality and Total Harmonic Distortion system report and system calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

One (1) digital package including a table showing the harmonic contributions from all contributing loads and calculations used to determine the maximum single harmonic contributor, total harmonic distortion and power quality of the electrical system must be provided to Canada in accordance with the NSFRV Build Contract CDRL. The deliverable must demonstrate that the harmonic spectrum, THD, harmonic components and voltage characteristics are within the specified limits.

DID T-325 Electrical Load Analysis

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Electrical Load Analysis (ELA) report and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-018 System Calculation Requirements
DID T-300 Hybrid Electric Power Generation and Distribution Systems
DID T-301 Electrical Equipment Arrangement
DID T-326 Electrical Single Line Diagrams
CCG NSFRV Operational Profile
219-087 Electrical System Analysis Report

3. PREPARATION INSTRUCTIONS:

Format:

The report and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the ELA:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

For the purpose of the calculations, the Contractor must include a spreadsheet containing all ELA related analysis and information including:

- a. Every load connected to the AC and DC electrical systems on the NSFRV based on the selected equipment to be installed. Each load will include

information on the following:

- i. Quantity;
 - ii. Total Power;
 - iii. Real Power;
 - iv. Power Factor;
 - v. Utilization Factor;
 - vi. Demand Factor;
 - vii. Load Factor;
 - viii. Voltage; and
 - ix. Current.
- b. Calculations must support capacity and phase balance of
- i. All energy generation equipment, main and emergency, generators, Energy Storage Systems (ESS);
 - ii. All distribution equipment, panels, switchboards, Motor Control Centers (MCC), disconnect switches, automatic transfer switches, cables etc.;
 - iii. All conversion equipment such as transformers, converters, inverters, DC rectifiers and batteries, Uninterruptable Power Supply systems and Variable Frequency Drives (VFD);

The System Report must include:

- a. A description of each scenario considered in the ELA and the assumptions made. In addition to the primary missions of the Operational Profile the ELA will include, but is not limited to the scenarios described in 219-087 Electrical System Analysis Report, section 3.6:

- i. Science Station Keeping
- ii. Science Mission-Low Speed
- iii. Fishing (Deploy Trawl Nets)
- iv. Fishing (Trawling):
- v. Fishing (Recover Trawl Nets)
- vi. Vessel Idling (Minimum Load)
- vii. Shore Power Summer Day–Charging
- viii. Alongside–No Shore Power
- ix. Economic Cruise Summer Day
- x. Economic Cruise Winter Night
- xi. Search & Rescue (Max Speed)
- xii. Silent Overnight

- b. A summary of the propulsion and resistance report, including a speed vs electrical power curve for the propulsion system in open water and ice conditions. The power curve will be used as the basis for the propulsion system load in the ELA;
- c. The margins used in the ELA and a description of the margins necessary for the future, including production design and construction electrical margins; and
- d. A section describing the results of the ELA and how they relate to the sizing of the main and emergency generators and any other sources of installed power, harbour generator, shore power, batteries, UPS systems, etc.

All primary missions referenced in the Operational Profile must be included in the ELA. Each mission analyzed must take into account summer, winter, and standard sea day loading.

In addition to the report and calculations, the Contractor must provide the following information:

- a. The size of the shore power connection and harbour generator (if applicable) using the shore power scenario results. The Contractor must include discussions on the following:
 - i. The capabilities based on recommended size, and whether the deck equipment can be used;
 - ii. The impacts of low loading on the main engines and harbor generator selected for extended periods alongside without shore power; and
 - iii. The impacts on the generation system.

The Report must track any changes and their effects on the systems as the design progresses.

Naming conventions and labels for all electrical components must be consistent across all deliverables.

The calculations must be available in their native format.

4. DELIVERABLES:

One (1) electronic copy of the ELA system report and system calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-326 Electrical Single Line Diagram

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Electrical Single Line Diagram report and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID T-300 Hybrid Electric Power Generation and Distribution Systems
DID T-301 Electrical Equipment Arrangement
DID T-303 Coordination Analysis
DID T-325 Electrical Load Analysis (ELA)
DID T-327 Power Management System
DID T-328 Fault Current Analysis
219-087 Electrical System Analysis Report

3. PREPARATION INSTRUCTIONS:

Format:

The report and drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Electrical Single Line Diagram:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. A system drawing in accordance with DID M-017 System Drawing Requirements.

For the purpose of the drawing(s), the Contractor must include the following analyses and information:

- a. The following equipment must be sized according to the Electrical Load Analysis (ELA) and Short Circuit Analysis indicating its voltage, capacity, ratings etc:
 - i. All energy generation equipment, main and emergency, generators, Energy Storage Systems (ESS)
 - ii. All distribution equipment, panels, switchboards, Motor Control Centers (MCC), disconnect switches, automatic transfer switches etc.
 - iii. All conversion equipment such as transformers, converters, inverters, Uninterruptable Power Supply systems and Variable Frequency Drives (VFD)
 - iv. All electrical loads with circuit breaker level
 - v. All supplies to 500-level motors and mechanical equipment (Major and Significant) including location of motor starters; and
 - vi. Equipment tags
- b. Identify cable information in accordance with LR Rules and Regulations Part 6, Chapter 2, Section 11.6 and the analysis of DID T-301 Electrical Equipment Arrangement including:
 - i. Cable number
 - ii. Full load current Ampacity rating of the cable
 - iii. Number of conductors
 - iv. Size of conductors
 - v. Type of cable
- c. Identify circuit breaker information as per the calculations determined by the analysis of DID T-325 ELA including:
 - i. Breaker rating
 - ii. Breaker type
 - iii. Breaker frame rating
- d. Show all instrumentation, protection devices and interlocks included inside the electrical equipment switchboards and panels;
- e. Breakers, including an Input/Output (I/O) connections on the Single Line Diagram (SLD);

- f. All spare and blank circuit breakers inside the electrical equipment switchboards and panels;
- g. Include an equipment schedule on the drawing for all Major and Significant electrical generation, distribution and propulsion equipment (i.e switchboards, panels, transformers, shore supply, batteries, DC rectifiers, UPS's, motors);
- h. Identify control locations for MCCs, Local Group Start Panels (LGSP), and individual starter panels; and
- i. Indicate which breakers have remote control I/O functionality as described in the DID T-327 Power Management System, load shedding, digital interlocking, preferential tripping, etc.

The Drawing(s) must track any changes and their effects on the systems as the design progresses.

Naming conventions and labels for all electrical components must be consistent across all deliverables.

4. **DELIVERABLES:**

One (1) electronic copy of the Electrical Single Line Diagram system report and system drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-327 Power Management System (PMS)

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Power Management System (PMS) report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements
DID T-235 Electric Propulsion System
DID T-300 Hybrid Electric Power Generation and Distribution Systems
DID T-325 Electrical Load Analysis
DID T-326 Electrical Single Line Diagrams
DID T-420 Navigation Systems
DID T-438 Ship Control and Monitoring System
DID T-438.1 Electric Propulsion System
Canada Shipping Act (CSA) (2001)
International Maritime Organization (IMO)
IEC, International Electrotechnical Commission 60092-504

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the PMS:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and

- c. System calculations in accordance with DID M-018 System Calculation Requirements.

In addition to the report, drawing(s) and calculations, the Contractor must provide the following information:

- a. Scenarios for potential electrical power debilitation with the configuration of the proposed electrical system. The scenarios must range from total vessel power loss to a loss of a single electrical power source, and any reasonable combination or permutation within these limits;
- b. A description of how the PMS addresses the scenarios of electrical power loss on the vessel;
- c. A definition of the hardware/software used, alarm and monitoring details, functional description, and performance specifications for the PMS system;
 - i. Including a description of how the control, alarm and safety systems for the hybrid electrical power system provide effective means for operation and control during all defined ship operational conditions per DID T-300 Hybrid Electric Power Generation and Distribution Systems.
- d. A comprehensive explanation of the key features and functions of the PMS and the development of PMS system specifications based on system functionalities;
 - i. System description including operating modes include modes agreed to by CCG as well as all normal and foreseeably abnormal operating modes.
 - ii. System description including all operating modes safety functions and their hierarchy, and expected battery system behavior in case of malfunction, failure or emergency.
 - iii. Description for sequence of transition between operating modes.
- e. Details of interfaces/interactions with other equipment and control monitoring systems, with specific attention to:
 - i. The main and emergency sources of power equipment of DID T-235 Electric Propulsion System and T-300 Hybrid Electric Power Generation and Distribution Systems;
 - ii. Electrical distribution equipment of DID T-300 Hybrid Electric Power Generation and Distribution Systems;
 - iii. SCMS and Voyage Data Recorder of DID T-438 Ship Control and

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- Monitoring System and DID T-420 Navigation Systems;
 - iv. The Propulsion Control System (PCS) and propulsion equipment of DID T-438.1 Propulsion Control System and DID T-235 Electric Propulsion System; and
 - v. Large consumers identified by DID T-325 Electrical Load Analysis.
- f. All supporting data and tabulated results of the analysis used in the development of this DID T-327 Power Management System.

4. DELIVERABLES:

One (1) electronic copy of the PMS report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-328 Fault Current Analysis

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Protective Devices report, drawing(s), and calculations, as well as identify to the Contractor the requirements for determining and presenting detailed calculations and all assumptions made in the fault current analysis carried out at all significant points in the power distribution.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements
DID T-300 Hybrid Electric Power Generation and Distribution Systems
DID T-303 Coordination Analysis
DID T-325 Electrical Load Analysis
DID T-326 Electrical Single Line Diagrams

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Protective Devices:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and

c. System calculations in accordance with DID M-018 System Calculation Requirements.

The analysis must calculate the time domain fault current for the sub-transient, transient, and steady state stages of the fault, and illustrate the symmetrical and asymmetrical components of the waveform. The loading scenario used as initial conditions for calculation of the fault current must be based on the loading scenarios in accordance with DID T-325 Electrical Load Analysis (ELA) at a minimum. The possibility of a scenario where the short circuit current could be higher than any scenario in the ELA should be examined. A Fault Current Analysis must be provided and calculated with certified vendor generator information in accordance with IEC 61363.

In addition to the report, drawing and calculations, the Contractor must provide the following information:

a. Ratings of:

- i. Essential, non-essential, propulsion and emergency switchboards
- ii. Motor Control Centre (MCC) switchboards and panels
- iii. switchboards and panels
- iv. Other major loads such as cranes, thrusters, fire pumps, etc
- v. Main sources of power

b. Time dependent short circuit fault decrement at various electrical distribution levels in order to support Circuit Breaker Coordination Analysis of DID T-303 Coordination Analysis;

c. Fault current levels during the following scenarios:

- i. At the worst-case expected loading condition when operating on Main Power as determined in the analysis of DID T-325 Electrical Load Analysis with consideration for major and significant equipment that will contribute to fault current
- ii. At the worst-case expected loading when operating on emergency power as determined in the analysis of DID T-325 Electrical Load Analysis with consideration for major and significant equipment that will contribute to fault current
- iii. At the worst-case expected loading when operating on shore power as determined in the analysis of DID T-325 Electrical Load Analysis with consideration for major and significant equipment that will contribute to fault current

- iv. The possibility of a configuration where fault currents will be greater than the scenarios detailed in parts i, ii, or iii should be examined, and if found included in analysis
- d. Maximum available Root Mean Square (RMS) short circuit current at all selected fault locations;
- e. Peak cycle asymmetrical short circuit currents at all selected fault locations;
- f. Contributions from equipment, such as motors and pumps and main power sources;
- g. A schematic of the distribution system showing locations of assumed faults. Minimum key points in the distribution system are indicated above. The diagram must also detail assumed cable sizes, type, quantity of conductors and estimated length;
- h. A schematic impedance diagram indicating all estimated impedance values used in the calculation of fault currents. Impedance must be provided for all major circuit elements, including generation, transformers, converters, battery banks/UPS, switchboards and conductors;
- i. A summary table is to be included which lists all circuit breakers and distribution equipment with the recommended fault current ratings;
- j. Recommendation Kilo-Ampere Interrupting Capacity (KAIC) rating for all main electrical equipment and protective devices.

The Report, Calculations, and Drawing deliverables must track any changes and their effects on the systems as the design progresses.

Naming conventions and label for all electrical components must be consistent across all deliverables.

4. DELIVERABLES:

One (1) electronic copy of the Protective Devices report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-330 Lighting System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Lighting System report, drawing(s), and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements
DID T-304 Cable Tray and Schedule
DID T-325 Electrical Load Analysis
DID T-420 Navigation Systems
DID T-512 Heating, Ventilation, Air Conditioning (HVAC)
Integrated System
DID T-601 General Arrangement
ASTM F1166-07
IES RP-12, 1997
MOHS SOR-2010-120

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Lighting System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and

- c. System calculations in accordance with DID M-018 System Calculation Requirements.

In addition to the report, drawing(s) and calculations requirements, the Contractor must include, but is not limited to the following information:

- a. A Light Fixture Table that captures each type of fixture to be installed, including the following information:
 - i. Fixture type;
 - ii. Quantity of fixtures;
 - iii. Mounting type (surface, recessed, etc.);
 - iv. Lamp type and quantity;
 - v. Lens type and thickness;
 - vi. Wattage per fixture; and
 - vii. The fixture's IP rating.

Report:

- a. An analysis of the vessel's mission profile which describes the operational conditions and how the lighting system will be customized to support these operations;
- b. An analysis of the red/night lighting areas proposed for the vessel, i.e. bridge, accommodations, and the type of fixtures proposed for areas with drop/suspended ceilings;
- c. A section considering ergonomics of the lighting design as laid out by the Classification Standards, including light color temperature selection for spaces and its effects;
- d. A section describing the flood lighting provided for operations and information on floodlight control and control location; and
- e. A section describing the consideration taken in areas where space is an issue or concern, i.e. interference with HVAC ductwork, piping systems, cables, etc.

Drawing(s):

- a. All internal and external general, emergency, transitional and special purpose lighting fixtures for the vessel;
- b. All switches and switching locations for the lighting designed for the vessel;
- c. A table including the following:
 - i. A list of all internal and external spaces, including locations for working deck, boat launching, over the side deployment locations, helicopter deck and hanger, muster and embarkation areas. For Navigation DID T-420;
 - ii. Illumination levels required for each location listed in accordance with IES RP-12, 1997, ASTM F1166-07 Table 38 and MOHS SOR-2010-120 in both normal and emergency scenarios. The illumination levels are to be submitted to Canada for review prior to the development of the lighting arrangement and design for the Vessel; and
 - iii. Recommend illumination levels for the NSFRV based on referenced standards, not to be less than MOHS SOR-2010-120.
- d. All light fixtures with their associated mounting height, unless surface/recessed mounted on the deckhead arranged on the latest version of T-601 General Arrangement; and
- e. HVAC, cables and cable trays to demonstrate the lighting fixture arrangement has been arranged without interferences.

Calculations:

- a. Specify the space, using its location identifier as shown on DID T-601 General Arrangement;
- b. Specify the lighting level required by the Rules and Regulations, agreed to by Canada;
- c. The reflectance contribution levels of the finished surfaces (bulkheads, decks etc.);
- d. Specify the maintenance factors used;

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- e. Provide the calculation used to attain a lux level for each space;
- f. Provide the calculated lux level for spaces and working areas;
- g. Provide maximum, minimum, average calculated values for spaces and working areas; and
- h. Contour illumination levels superimposed on the Lighting Fixture Arrangement Drawing(s) for key functional areas.

4. DELIVERABLES:

One (1) electronic copy of the Lighting System report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-405 Mast and Antenna Arrangements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Mast and Antenna Arrangements report and arrangement drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-019 Arrangement Drawing Requirements
DID T-406 Antenna Arrangement Electromagnetic Compatibility Analysis

3. PREPARATION INSTRUCTIONS:

Format:

The report and arrangement drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Mast and Antenna Arrangements:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

In addition to the report and arrangement drawings, the Contractor must provide the following information:

- a. An external antenna arrangement plan showing all antenna, navigation equipment (including navigation lighting) and communication equipment;

- b. The location of equipment, maintenance platform, and fall protection points if required for the antennas;
- c. Both plan and elevation views, including the make and model of each antenna selected;
- d. The placement of all antennas, radiating and receiving devices which must be in accordance with the EMC Analysis as outlined in DID T-406 Antenna Arrangement Electromagnetic Compatibility Analysis;
- e. Show the RF Hazard areas that exceed Health Canada Code 6 Limits for personnel;
- f. A detailed description of alternative antenna configurations that were considered and the reasons for rejection; and
- g. A narrative, indicating all factors considered for the proposed antenna arrangement, and the impact of each factor on the selection of the proposed configuration.

4. DELIVERABLES:

One (1) electronic copy of Mast and Antenna Arrangements report and arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-406 Antenna Arrangement Electromagnetic Compatibility Analysis

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Antenna Arrangement Electromagnetic Compatibility (EMC) Analysis report and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-019 Arrangement Drawing Requirements
DID T-405 Mast and Antenna Arrangements
IEC 60533, Electrical and Electronic Installation in Ships –
Electromagnetic Compatibility

3. PREPARATION INSTRUCTIONS:

Format:

The report and arrangement drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Antenna Arrangement Electromagnetic Compatibility Analysis:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

In addition to the report and arrangement drawings, the Contractor must provide the following information:

- a. An electromagnetic capability analysis of all antennas, radiating and receiving devices;

- b. A detailed description of how to mitigate Electromagnetic Interference (EMI) between antennas and other systems;
- c. An analysis of the Hazards of Electromagnetic Radiation to Equipment (HERE);
- d. An analysis of the Hazards of Electromagnetic Radiation to Personnel (HERP);
- e. Show the RF Hazard areas that exceed Health Canada Code 6 Limits for personnel;
- f. An electromagnetic interference assessment between equipment causing performance degeneration;
- g. An assessment of the coverage of the various antennas;
- h. An analysis of the expected mitigation effects;
- i. Overall conclusions of the electromagnetic compatibility analysis and recommendations for optimal equipment placement;
- j. The vendor furnished information of the final equipment selection; and
- k. The placement of all antennas, radiating and receiving devices which must be in accordance with the DID T-405 Mast and Antenna Arrangements.

4. DELIVERABLES:

One (1) electronic copy of the Antenna Arrangement Electromagnetic Compatibility Analysis report and arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-420 Navigation Systems

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Navigation Systems report and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report and drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Navigation Systems:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements.

In addition to the report and drawing(s), the Contractor must produce a description of operation for the Navigation Systems which must describe the systems developed and include a brief discussion of the systems architecture, components, equipment location, operation, hardware, software and/or firmware used, display screens and details of interfaces and interferences with other components. The drawings and description of operations must include equipment specific information as equipment and components are selected.

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4. DELIVERABLES:

One (1) electronic copy of the Navigation Systems report and drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T- 428 Bridge Consoles

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Bridge Console report and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID T-668 Bridge Arrangement

3. PREPARATION INSTRUCTIONS:

Format:

The report and drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

3D files to be delivered in Rhino 6 or NAPA format. Other file formats can be submitted to CCG for approval prior to use.

Requirements:

The Contractor must provide the following information for the Bridge Consoles:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements, and
- c. 3-dimensional model(s)

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In addition to the report and drawing(s), the Contractor must provide the following information:

- a. A drawing that clearly illustrates the relative placement and orientations of all control/monitoring components forming the operator interface.

4. DELIVERABLES:

One (1) electronic copy of the Bridge Consoles report and drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-430 Internal Data Transmission

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Internal Data Transmission report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s), and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Internal Data Transmission:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

In addition to the report and drawing(s), the Contractor must produce a description of operation for the Internal Data Transmission which must describe the systems developed and include a brief discussion of the systems architecture, components, equipment location, operation, hardware, software and/or firmware used, display screens and details of interfaces and interferences with other components. The drawings and description of operations include equipment specific information as equipment and components are selected.

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4. DELIVERABLES:

One (1) electronic copy of the Internal Data Transmission report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-436 Fire Detection System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Fire Detection System report and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format

The report, drawing and calculations shall be provided as indicated in the reference DIDs.

Requirements

The contractor shall provide the following information for the Fire Detection System:

- a. A system analysis report in accordance with DID M-16 System Report Requirements.
- b. A system drawing in accordance with DID M-017 System Drawing Requirements.

In addition to the report, drawing and calculations, the Contractor must also provide the following information:

- a. Locations and detector types, including IP rating.

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4. DELIVERABLES:

One (1) electronic copy of the Fire Detection System systems report and drawing(s) is to be delivered to Canada in accordance with the NSFRV Build CDRL.

DID T-438 Ship Control and Monitoring System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Ship Control and Monitoring System (SCMS) report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the SCMS:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

For the purpose of the report and drawings, the Contractor must provide:

- a. An SCMS Block Diagram illustrating the interconnection of SCMS components including:
 - i. SCMS Operator/Viewer Stations;

- ii. SCMS network servers;
 - iii. Alarm towers/ annunciators;
 - iv. Remote Terminal Units (RTU)/slave units; and
 - v. Uninterruptable Power Supplies (UPS).
- b. The SCMS Input/Outputs and Alarm and Signal List must be prepared in a Microsoft Excel format and must identify all hardwired, discrete, analog and serial control and monitoring points associated with SCMS, as well as running time counters;
- c. SCMS Acceptance Test Plan must describe the method by which the SCMS equipment/system will be tested to verify/validate that the system operates as designed and in accordance with specifications; and
- d. Mimics and Displays must describe all graphical information to be implemented on the SCMS operator stations. The mimics must accurately represent the schematic, topology and configuration of all shipboard services controlled and/ or monitored by the SCMS.

4. DELIVERABLES:

One (1) electronic copy of the SCMS report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-438.1 Propulsion Control System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Propulsion Control System report, drawings, and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements
DID T-327 Power Management System
DID T-428 Bridge Consoles
DID T-438 Ship Control and Monitoring System

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s), and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Propulsion Control System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

In addition to the report, drawing(s) and calculations, the Contractor must provide the following information:

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- a. Detailed descriptions of the interfaces, coordinated control functionality and/or interactions with:
 - i. The power management system;
 - ii. The propulsion system equipment;
 - iii. Ship control and monitoring system;
 - iv. Autopilot system; and
 - v. Voyage data recorder.

4. DELIVERABLES:

One (1) electronic copy of the Propulsion Control System report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-440 External Data Transmission

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the External Data Transmission report and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report and drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the External Data Transmission:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements.

In addition to the report and drawing(s), the Contractor must produce a description of operation for the External Data Transmission which must describe the systems developed and include a brief discussion of the systems architecture, components, equipment location, operation, hardware, software and/or firmware used, display screens and details of interfaces and interferences with other components. The drawings and description of operations must include equipment specific information as equipment and components are selected.

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4. DELIVERABLES:

One (1) electronic copy of the External Data Transmission report and drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-460 Science Sonar and Transducers

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Science Sonar and Transducers report and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report and drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Science Sonar and Transducers:

- a. A system report in accordance with DID M-016 System Report Requirements; and
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements.

In addition to the report and drawing(s), the Contractor must produce a description of operation for the Science Sonar and Transducers which must describe the systems developed and include a brief discussion of the systems architecture, components, equipment location, operation, hardware, software and/or firmware used, display screens and details of interfaces and interferences with other components. The drawings and description of operations must include equipment specific information as equipment and components are selected.

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4. DELIVERABLES:

One (1) electronic copy of the Science Sonar and Transducers report and drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-501 Auxiliary Machinery Arrangements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Auxiliary Machinery Arrangements drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DID referenced in Section 2 above.

3D files to be delivered in Rhino 6 or NAPA format. Other file formats can be submitted to CCG for approval prior to use.

Requirements:

The Contractor must provide the following information for the Auxiliary Machinery Arrangements:

- a. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

The arrangement of the vessel auxiliary machinery spaces must be determined in consultation with Canada.

The Contractor must develop and maintain the plan, elevation, and section view drawings and 3-dimensional model(s) for the vessel that clearly show the vessel's auxiliary machinery spaces as the work progresses through increasing maturity. The drawing(s) must include, but is not limited to:

a. Auxiliary Machinery Space.

The drawing(s) and/or model(s) must include all major and significant machinery as well as features of the space commensurate with the level of design detail available. The drawing(s) and/or models must demonstrate how the arrangement complies with the original equipment manufacturer's specifications, Contract Specifications, international conventions, statutory regulations, and Classification Society requirements.

In addition to the information required by DID M-019 Arrangement Drawings Requirements, the Contractor must provide the following equipment information in the auxiliary machinery arrangement:

- a. Sewage Treatment equipment;
- b. Domestic Machinery (Refrigeration, Calorifiers, etc.);
- c. Potable Water Generation equipment;
- d. Shipboard air conditioning units / Chillers;
- e. Compartment heaters;
- f. Bow Thruster;
- g. Variable Frequency Drives (VFD's);
- h. All major pumps, motors, heat exchangers, condensers, compressors, large strainers and air receivers;
- i. An outline of the main vent ducts;
- j. Control stations and alarm panels;
- k. Valve-manifolds 500 mm and larger;
- l. Platforms and ladders;

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- m. Work benches;
- n. Loose tanks with a volume in excess of 1m³;
- o. Fire suppression equipment; and
- p. Total flood fire suppression system agent storage if located in machinery space.

4. DELIVERABLES:

One (1) electronic copy of the Auxiliary Machinery Arrangements drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-512 Heating, Ventilation, Air Conditioning (HVAC)

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Heating, Ventilation, Air Conditioning (HVAC) System report, drawing(s), calculations, and arrangement drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements
DID M-019 Arrangement Drawing Requirements
DID T-601 General Arrangement

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s), calculations, and arrangement drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

3D files to be delivered in Rhino 6 or NAPA format. Other file formats can be submitted to CCG for approval prior to use.

Requirements:

The Contractor must provide the following information for the HVAC System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements;

- c. System calculations in accordance with DID M-018 System Calculation Requirements; and
- d. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

In addition to the report, drawing(s), calculations and arrangement drawing(s), the Contractor must provide the following information:

Report:

- a. A separate report or separate section of the report dedicated to the HVAC Control and Monitoring System Description.

Drawing(s):

- a. An overlay of system equipment and distribution ducting onto the General Arrangement (GA); and
- b. A separate drawing or separate section of the drawing for the HVAC Control System Block Diagram.

Calculations:

The Contractor must provide a calculation deliverable which must cover the following calculations:

- a. Ventilation Requirements and Air Balance Calculation;
 - i. Calculations performed for system operation covering all design scenarios including summer conditions, winter operations, crewed winter lay-up, and uncrewed winter lay-up.
- b. Heating and Cooling Load Calculations;
 - i. Calculations performed for system operation covering all design scenarios including summer conditions, winter operations, crewed winter lay-up, and uncrewed winter lay-up; and
 - ii. Use of equipment VFI rather than equipment estimates for heat dissipation when available.

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- c. HVAC System Pressure Loss Calculations; and
- d. Noise Calculation and Silencer Definition.

Arrangement Drawing(s):

- a. Inclusion of plan and necessary elevation views, and 3D model, in order to demonstrate functional arrangement of HVAC compartment(s).

4. DELIVERABLES:

One (1) electronic copy of the HVAC System report(s), drawing(s), calculation(s), and arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-521 Firemain System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Firemain System report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Firemain System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Firemain System report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-522 Water Mist System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Water Mist System report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Water Mist System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Water Mist System report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T- 524 Scientific Sea Water System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Scientific Sea Water System drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Scientific Sea Water System:

- a. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Scientific Sea Water System drawing(s) and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-526 Scuppers and Drains System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Scuppers and Drains System drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Scuppers and Drains System:

- a. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Scuppers and Drains System drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T- 528 Black and Grey Water System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Black and Grey Water System report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Black and Grey Water System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Black and Grey Water System report, drawing(s) and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T- 529 Bilge and Ballast System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Bilge and Ballast System drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Bilge and Ballast System:

- a. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Bilge and Ballast System drawing(s) and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-533 Domestic Fresh Water System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Domestic Fresh Water System report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Domestic Fresh Water System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Domestic Fresh Water System report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-543 Lubricating Oil Fill and Transfer System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Lubricating Oil Fill and Transfer System drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Lubricating Oil Fill and Transfer Systems:

- a. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Lubricating Oil Fill and Transfer System drawing(s) and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T- 544 Oily Bilge and Waste Oil Systems

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Oily Bilge and Waste Oil Systems drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Oily Bilge and Waste Oil Systems:

- a. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- b. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Oily Bilge and Waste Oil Systems drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-551 Compressed Air Systems

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Compressed Air Systems report, drawing and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Compressed Air Systems:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

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4. DELIVERABLES:

One (1) electronic copy of the Compressed Air System report, drawing(s) and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-555 Fixed Firefighting System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Fixed Firefighting System report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Fixed Firefighting Systems:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Fixed Firefighting Systems report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-556 Hydraulic Systems

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Hydraulic Systems report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Hydraulic Systems:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

In addition to the report, drawing(s) and calculations, the Contractor must provide the following information:

Drawing(s):

- a. Directional control valve and hydraulic line Piping and Instrumentation Details (P&ID) for each hydraulic end user. These can be referenced as additional sheets within the deliverable if found to be too cluttered within the main system P&ID;
- b. P&ID details of the hydraulic tank and accumulator fitted components such as, but not limited to; manholes, handholes, heaters, gauges, and ports (connected and capped);
- c. Pump P&ID internal details such as, but not limited to: controllers, pilot feedback, valves, charge pumps, Power Take Offs (PTOs), and drains;
- d. Directional control valve P&ID internal details such as, but not limited to: pilot feedback, valves, and drains; and
- e. Hydraulic cleanliness levels as identified within the specification requirements, as well as the cleanliness required and that can be maintained by the system. Cleanliness is to be indicated as per ISO 4406 three point system.

Calculations:

- a. A Hydraulic Usage Table identifying for each Hydraulic Power Unit (HPU):
 - i. each hydraulic end user to be powered by the HPU;
 - ii. each end user pressure and flow demand;
 - iii. the activities/missions/mobilizations for which the hydraulic end users are employed (ex. Anchoring, Mooring, Storing, etc.);
 - iv. the usage factor of each end user intended to operate during each activity/mission/mobilization;
 - v. the maximum pressure demand per activity/mission/mobilization the HPU must meet;
 - vi. the total flow demand per activity/mission/mobilization the HPU must meet;
 - 1. Note: bullets a.v. and a.vi are used to assess the required capacity of the HPU(s).
- b. The calculations and assumptions used to select the HPU pumps, heat exchangers, accumulators, control valves, etc.;

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- c. A summary of the calculated pipe or tube size requirements for each end user, as well as any distribution piping shared by multiple end users, and the necessary inputs used in the evaluation;
- d. At least one detailed example calculation of the method(s) used to arrive at the solutions within the above bullet;
- e. A summary of the recommended off-the-shelf pipe or tube size for each end user, as well as any distribution piping shared by multiple end users; and
- f. A summary and associated datasheets for the HPU and hydraulic system components (ex. pumps, valves, gauges, accumulators, etc.). Details are to include weight, dimensions, maintenance area requirements, and any interface requirements.

4. DELIVERABLES:

One (1) electronic copy of the Hydraulic Systems report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-568 Bow Tunnel Thruster Arrangement

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Bow Tunnel Thruster Arrangement drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-017 System Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Bow Tunnel Thruster Arrangement:

- a. A system drawing(s) in accordance with DID M-017 System Drawing Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Bow Tunnel Thruster Arrangement drawings must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-581 Anchoring and Stowage System

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Anchoring and Stowage System report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Anchoring and Stowage System:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

Within the report, drawings, calculations and arrangement drawing(s), the Contractor must provide the following information:

Drawing(s):

- a. A title page listing the Anchoring and Stowage equipment details. The details must include the following:
 - i. The manufacturer name, model;
 - ii. Safe Working Load (SWL);
 - iii. chain and/or wire and/or rope details (ex. size, length, minimum break strength, etc.); and
 - iv. description (i.e. information in excess of the above to have an appreciation of the equipment).
- b. Arrangements are to clearly identify local and remote control positions and anticipated space requirements;
- c. Console drawings are to include overall dimensions, anticipated ship interface/connection positions, and details on the control joysticks, buttons, and alarms fitted; and
- d. Electrical equipment (ex. VFD cabinet(s), brake resistor(s)) details and drawings, if fitted, including weight, dimensions, maintenance area requirements, and any interface requirements.

Calculations:

- a. Calculations and assumptions used to size the Anchoring and Stowage equipment to meet Class requirements and guidance;
- b. Calculations and assumptions used to size the Anchoring and Stowage equipment to meet the requirements and guidance of any used standard (ex. ISO, SNAME, etc.);
- c. A summary and associated datasheets for the Anchoring and Stowage equipment (ex. windlasses, winches, bits, chocks, smit brackets, etc.). Details are to include weight, dimensions, maintenance area requirements, anticipated reaction loads, and any interface requirements.

4. DELIVERABLES:

One (1) electronic copy of the Anchoring and Stowage System report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-582 Mooring and Towing Systems

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Mooring and Towing Systems report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Mooring and Towing Systems:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

Within the report, drawings, calculations and arrangement drawing(s), the Contractor must provide the following information:

Drawing(s):

- a. A title page listing the Mooring and Towing equipment details. The details must include the following:
 - i. The manufacturer name, model;
 - ii. Safe Working Load (SWL);
 - iii. chain and/or wire and/or rope details (ex. size, length, minimum break strength, etc.); and
 - iv. description (i.e. information in excess of the above to have an appreciation of the equipment).
- b. Arrangements are to identify both normal mooring configurations and heavy weather configurations;
- c. Arrangements are to clearly identify local and remote control positions and anticipated space requirements;
- d. Console drawings are to include overall dimensions, anticipated ship interface/connection positions, and details on the control joysticks, buttons, and alarms fitted; and
- e. Electrical equipment (ex. VFD cabinet(s), brake resistor(s)) details and drawings, if fitted, including weight, dimensions, maintenance area requirements, and any interface requirements.

Calculations:

- a. Calculations and assumptions used to size the Mooring and Towing equipment to meet Class requirements and guidance;
- b. Calculations and assumptions used to size the Mooring and Towing equipment to meet the requirements and guidance of any used standard (ex. ISO, SNAME, etc.); and
- c. A summary and associated datasheets for the Mooring and Towing equipment (ex. winches, bits, chocks, etc.). Details are to include weight, dimensions, maintenance area requirements, anticipated reaction loads, and any interface requirements.

4. DELIVERABLES:

One (1) electronic copy of the Mooring and Towing Systems report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-591 Mission Equipment

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Mission Equipment report, drawing(s) and calculations.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-017 System Drawing Requirements
DID M-018 System Calculation Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The report, drawing(s) and calculations must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Mission Equipment:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. A system drawing(s) in accordance with DID M-017 System Drawing Requirements; and
- c. System calculations in accordance with DID M-018 System Calculation Requirements.

Within the report, drawing(s) and calculations, the Contractor must provide the following information:

- a. Specifications for the crane must include, but are not limited to:
- i. The dry and wet weight;
 - ii. Control and monitoring details;
 - iii. Dynamic loading factors and operating temperatures used to design the lifting equipment and the assumptions used to determine the safe working loads;
 - iv. Fitted winch details including: wire specifications (i.e. length, nominal diameter, material type, construction type (ex. 6x19, 7x19, etc.), core type, breaking strength), drum dimensions, line pull, and line speed;
 - v. Sheave details including monitoring details, dimensions, and materials of construction;
 - vi. Hydraulic system details;
 - vii. Materials of construction;
 - viii. Power requirements;
 - ix. Surface treatment details; and
 - x. Technical data including safe working loads at associated reaches for both onboard and offboard lifts, and speed of movement.
- b. Drawings for the cranes must include, but are not limited to:
- i. Elevation and plan drawings showing the dimensions, the configuration of the crane, hoist, hook, and crutch/lashing;
 - ii. Performance and specifications including, at a minimum: certification type and society, safety features (ex. MPS, Anti-Two Block, etc.), slewing angle limits and speed, operating temperature range, maximum wind speed, main hoist capacity and hook speed, dry and wet weight, crutch/lashing weight, oil cleanliness level (ISO 4406 three point).
 - iii. Main hook travel path overlayed on crane profile showing height and reach dimensions, and dead zones. The following details are to also be tabulated: lift Sea States and Scenarios as agreed to through consultation with Canada, with associated reach and safe working load limits, identification of lift type, and Heel, Trim, Offlead, and Sidelead limits;
 - iv. Maintenance envelope requirements;
 - v. Foundation loading and associated assumptions; and
 - vi. Control and powering details including, at a minimum, hydraulic flow rates and pressures and associated P&ID, and electrical power requirements.

- c. Specifications for mission winches must include, but are not limited to:
- i. A table listing the total wire length on the drum per drum layer, the total wire length deployed per drum layer, and the winch line pull and corresponding speed per drum layer;
 - ii. Drum freeboard;
 - iii. The cable or wire specifications: length, nominal diameter, material type, construction type (ex. 6x19, 7x19, etc.), core type, breaking strength, and end fitting details;
 - iv. The calculations and assumptions used to calculate the winch pulls and package loads, including the dynamic loading forces due to package drag (resulting from winch recovery speed, and towing forces, etc.), inertia loads, in addition to the static mass of the package and cable/wire;
 - v. The dry and wet weight of each winch;
 - vi. Loading factors used in both the design and construction of the winches;
 - vii. Brake details;
 - viii. Control and monitoring details;
 - ix. Lebus shell details;
 - x. Level wind details;
 - xi. Materials of construction;
 - xii. Motor and gearbox details;
 - xiii. Power requirements; and
 - xiv. Surface treatment details.
- d. Drawings for the mission winches must include, but are not limited to:
- i. Elevation and plan drawings demonstrating the configuration of the winch and level wind arrangement, and winch dimensions including clearances required for maintenance and/or operation;
 - ii. The total wire length on the drum, and wire details (i.e. nominal diameter, material, construction type, core type);
 - iii. The winch line pull and corresponding speed for the bare drum, mid drum, and full drum conditions;
 - iv. The cable or wire nominal diameter, type, and breaking strength;
 - v. The dry and wet weight of the winch;
 - vi. Operating temperature range;
 - vii. Sea State operation limit;
 - viii. Maintenance envelope requirements including the removal of the largest components (ex. motors, screws, etc.);
 - ix. Foundation loading and associated assumptions;
 - x. Control and powering details including, but not limited to; hydraulic flow rates and pressures and associated P&ID, cooling water rates

- and pressures, and electrical power requirements and/or variable frequency drive cabinet details including dimensions and mass; and
- xi. Free end arrangement details.

e. Specifications for the mission lifting equipment must include, but are not limited to:

- i. The dry and wet weight of the individual equipment;
- ii. Control and monitoring details;
- iii. Dynamic loading factors and operating temperatures used to design the lifting equipment and assumptions used to determine the safe working loads;
- iv. Fitted winch(es) details (where applicable) including wire specifications (i.e. length, nominal diameter, material type, construction type (ex. 6x19, 7x19, etc.), core type, breaking strength), drum dimensions, bare drum and full drum line pull, and line speed;
- v. Sheave details including monitoring details (where applicable), dimensions, and materials of construction;
- vi. Hydraulic system details;
- vii. Materials of construction;
- viii. Power requirements;
- ix. Surface treatment details; and
- x. Technical data including safe working load, reach, and speed of movement.

f. Drawings for the mission lifting equipment must include, but are not limited to:

- i. Elevation and plan drawings showing the dimensions, the configuration of the winch(es) (where applicable) and sheaves, safe working loads and corresponding reaches of the equipment;
- ii. The dry and wet weight of the equipment;
- iii. Operating temperature range;
- iv. Sea State operation limit;
- v. Maintenance envelope requirements including the removal of the largest components (ex. motors, screws, etc.);
- vi. Foundation loading and associated assumptions; and
- vii. Control and powering details including, but not limited to; hydraulic flow rates and pressures and P&ID, and electrical power requirements.

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The Contractor must provide a Control System Operating Manual which is to include, but not be limited to:

- i. local and remote controller drawings for the mission equipment. The drawings must include overall dimensions, and details on the control joysticks, buttons, and alarms fitted;
- ii. HMI screens and pages details; and
- iii. SCMS interface parameters.

The Contractor must provide the VFD cabinet(s) and brake resistor(s) drawings including mass, dimensions, maintenance area required, and any interface requirements.

4. DELIVERABLES:

One (1) electronic copy of the Mission Equipment report, drawing(s), and calculations must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-601 General Arrangement

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the General Arrangement (GA) drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DID referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the GA:

- a. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

The GA drawing(s) must illustrate:

- a. The compartment boundaries;
- b. Doors;
- c. Hatches;
- d. Manholes;
- e. Basic Compartment Outfit; and
- f. Windows and Portlights.

4. DELIVERABLES:

One (1) electronic copy of the GA drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-602 Hull Designation and Markings

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Hull Designation and Markings arrangement drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DID referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Hull Designation and Markings:

- a. An arrangement drawing(s) in accordance with DID M-019 System Drawing Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Hull Designation and Markings arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-631 Coating and Surface Treatments

1. PURPOSE of DID:

The purpose of this DID is to define the requirements for a schedule and keyplan for all coatings and surface treatments.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The schedule must be prepared in the Contractors format and agreed to by Canada.

The BoM must be provided as a Microsoft Office suite format and as a searchable PDF for all versions prior to the final version. The final version must be provided in both Microsoft Word and as a searchable PDF.

The Keyplan drawing for the Coating and Surface Treatments must be completed in accordance with the applicable format in the DID referenced in Section 2 above.

Requirement:

The Coatings and Surface Treatment schedule must identify all of the paints, coatings and any associated surface treatments used in the NSFRV.

It must provide an index of all paints, thicknesses, surface preparations and sequences.

A Keyplan drawing, in accordance with DID M-019 System Drawing Requirements, must also be completed showing the locations and types for all coatings and surface treatments.

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4. DELIVERABLES:

One (1) electronic copy of the Coatings and Surface Treatment Schedule and arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-633 Cathodic Protection System and Arrangement

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Cathodic Protection System and Arrangement report, calculations and arrangement drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-016 System Report Requirements
DID M-018 System Calculation Requirements
DID M-019 Arrangement Drawing Requirements
DID T-051 Fuel Endurance
DID T-601 General Arrangement
DID T-631 Coating and Surface Treatment Arrangement
TP127E, Ship's Electrical Standards
IMO Resolution A.798(19)

3. PREPARATION INSTRUCTIONS:

Format:

The report, calculations and arrangement drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Cathodic Protection System and Arrangement:

- a. A system report in accordance with DID M-016 System Report Requirements;
- b. System calculations in accordance with DID M-018 System Calculation Requirements; and
- c. An arrangement drawings in accordance with DID M-019 Arrangement Drawing Requirements.

The Cathodic Protection System anodes must be compatible with underwater coatings of DID T-631 Coating and Surface Treatment Arrangement.

Drawings must be updated with the latest revision of the arrangement provided by DID T-601 General Arrangement.

Current Density (CD) calculations must account for increased resistivity of seawater due to low salinity and cold water operations.

The report, calculations and arrangement drawing(s) provided by the Contractor must consider the following information in the Cathodic Protection System analysis:

- a. Type and location of sacrificial anodes installed in all hull appendages or recessions. The type of sacrificial anode must specify the chemical composition, mass, capacity and manufacturer. Sacrificial anode locations may include:
 - i. Propellers;
 - ii. Podded propulsor;
 - iii. Hull;
 - iv. Bow thruster tunnel;
 - v. Sea chests (excluding any sea chests for seawater sampling and fresh water making); and
 - vi. Sea bays.
- i. Earthing cables and cables between rectifier, vessel, reference electrodes and the impressed current anodes;
- ii. Any Impressed Current Cathodic Protection (ICCP) kits; and
- iii. An analysis of ICCP for rudders and podded propulsors.

In addition to the report, calculations and arrangement drawing(s) requirements, the Contractor must provide the following information:

- a. An analysis of cathodic protection strategies for the hull, appendages and recessions;
- b. An analysis of cathodic protection options and arrangements for the NSFRV;
- c. An analysis of ICCP for podded propulsors;

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- d. Recommendations for the cathodic protection system for the NSFRV;
- e. Recommendations based on the analysis of this DID T-633, for the cathodic protection system arrangement;
- f. Electrolytical antifouling and corrosion reduction system for sea chests and internal piping systems; and
- g. All drawings, reports and calculations associated with the development of this DID T-633.

4. DELIVERABLES:

One (1) electronic copy of Cathodic Protection System report, calculations, and arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-634 Deck Coverings Arrangement

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Deck Coverings Arrangement drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DID referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for Deck Coverings Arrangement:

- a. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

Within the arrangement drawing(s), the Contractor must provide details on the transitions between deck coverings, terminations and areas where the deck covering intersects bulkheads.

4. DELIVERABLES:

One (1) electronic copy of the Deck Coverings Arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

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DID T-635 Insulation Arrangement

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Insulation Arrangement calculations and drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-018 System Calculation Requirements
DID M-019 Arrangement Drawing Requirements.

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DID referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Insulation Arrangement:

- a. System calculations in accordance with DID M-018 System Calculation Requirements.
- b. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

4. DELIVERABLES:

One (1) electronic copy of the Insulation Arrangement calculations and drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-640 Compartment Arrangements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Compartment Arrangement drawings.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DID referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Compartment Arrangements:

- a. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

The information must be provided for the following compartments:

- a. All cabins;
- b. Dry lab;
- c. Wet lab;
- d. Mess/lounge;
- e. Mudroom;
- f. Galley;
- g. Storerooms;
- h. Garbage; and
- i. Cargo hold

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In addition to the arrangement drawing(s), the Contractor must provide the following information for the **Cargo Hold** :

- a. Equipment and cargo securing socket and tie-down arrangements and details;
- b. Lifting arrangements and details;
- c. Overlay and spatial impact details from bulkhead, tank top and structure;
- d. Main deck cargo hatch, and escape and/or access hatch locations and below deck coverage. Identification of any other access and/or equipment/cargo transfer openings to the space; and
- e. Identification of any cage or joiner divisions.

4. DELIVERABLES:

One (1) electronic copy the Compartment Arrangements drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-666 Working Deck Arrangements

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Working Deck Arrangements drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements
DID T-428 Bridge Console

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

Requirements:

The Contractor must provide the following information for the Working Deck Arrangements:

- a. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements.

In addition to the arrangement drawing(s), the Contractor must provide the following information:

Arrangement Drawing(s):

The arrangement drawing(s) must include, but are not limited to:

- a. A title page listing the cranes, mission lifting equipment, mission winches, control consoles, winch Variable Frequency Drive (VFD) cabinets (if fitted), brake resistors (if fitted), and sheave details. The details must include the following:

- i. The manufacturer name, model, winch pulls and corresponding speeds for the bare drum full and full drum pull;
 - ii. The sheave Safe Working Load (SWL);
 - iii. The winch wire or cable length and size fitted;
 - iv. The cranes, and mission lifting equipment minimum; and maximum reach and corresponding SWL.
- b. Elevation and plan views showing the locations of the cranes, mission lifting equipment, mission winches. The views must include the following:
 - i. The permanently fitted equipment and structures around the crane, mission lifting equipment, and mission winches;
 - ii. The locations of the control panels for the crane, mission lifting equipment, and mission winches; and
 - iii. Routing of winch wires/cables.
- c. Elevation and plan views showing the locations of the winch VFD cabinets (if fitted), and required equipment such as the brake resistors (if fitted). The views must include permanently fitted equipment and structures around the VFD cabinets;
- d. Elevation and plan views of the crane safe working loads and corresponding reaches over the decks and over the side(s) of the vessel;
- e. Elevation and plan views depicting the procedures (including locations of sheaves) for routing the mission specific winches' wires to the necessary positions;
- f. A plan view of the location and specific details of the deck tie-down fittings (including dimensions, and SWL) on the working deck, boat deck, and mission spaces; and
- g. A plan view of the working deck, boat deck, and mission spaces including locations of the mission specific science winches, over the stern/side lifting equipment, and mission specific packages for each mission.

The Contractor, with the guidance of Canada and consultation with vendors, must develop and provide the plan and elevation view drawings of the aft control station, including incorporation of Aft Control Chair in order to demonstrate that there is sufficient space allocated for the equipment and services required.

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The arrangement drawing(s) must also include details regarding the location of the control consoles, communications systems, heating and ventilation locations, window heating and washing system(s), and all other equipment and services located within the space.

4. DELIVERABLES:

One (1) electronic copy of the Working Deck Arrangements drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

DID T-668 Bridge Arrangement

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Bridge Arrangement drawing(s).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-019 Arrangement Drawing Requirements
DID T-428 Bridge Consoles
SOLAS, Chapter V, Regulation 22 – Navigational Bridge Visibility
MSC/CIRCULAR.982 – Guidelines for Ergonomic Criteria for
Bridge Equipment and layout

3. PREPARATION INSTRUCTIONS:

Format:

The arrangement drawing(s) must be provided in accordance with the applicable format in the DIDs referenced in Section 2 above.

3D files to be delivered in Rhino 6 or NAPA format. Other file formats can be submitted to CCG for approval prior to use.

Requirements:

The Contractor must provide the following information for the Bridge Arrangement:

- a. An arrangement drawing(s) in accordance with DID M-019 Arrangement Drawing Requirements, and
- b. 3-dimensional model(s)

The arrangement drawing(s) must include all bridge consoles as defined in DID T-428 Bridge Consoles.. The arrangement drawing(s) must demonstrate the arrangement in compliance with original equipment manufacturer's specifications, DIG specifications, international conventions, statutory regulations, and Classification Society requirements.

The Contractor must provide arrangement drawing(s) which includes, but is not

limited to:

- a. Sightlines in accordance with referenced standards;
- b. Clearly identified pieces of equipment with an appropriate labeling system;
- c. Consideration for interference with other systems, such as HVAC ductwork, piping systems and cable trays;
- d. Elevation views with electrical equipment within the space;
- e. The maintenance and access requirements for each console and panel in accordance with the manufacturer's recommendations;
- f. All equipment clearance dimensions as well as maintenance and access requirements that are governed by Classification Society or Statutory rules;
- g. Hashed/dotted line to illustrate maintenance and access envelopes; and
- h. A table listing all bridge equipment and class required bridge equipment on the first or last page with the following information:
 - i. Equipment Identifier;
 - ii. Equipment Description;
 - iii. Dimensions of Equipment (length, width and height); and
 - iv. Equipment mounting method (flush/surface).

4. DELIVERABLES:

One (1) electronic copy of the Bridge Arrangement drawing(s) must be delivered to Canada in accordance with the NSFRV Build Contract CDRL.

ANNEX R - Claim for Economic Price Adjustment and Exchange Rate Adjustment- PWGSC-TPSGC EPA

1 Item No.	2 Description	3 Reference	4 Bid Component Price (\$ CAN), P _n	5 Percentage of Bid Price (%)	5a column 4 x column 5 (\$ CAN)	6 Applicable Index*	7 Component Quantity	8 Initial Index (X ₀)	9 Final Index (X ₁)	10 % Change (X ₁ - X ₀) / X ₀ (+/-)	11 Adjustment = P _n x (%) x Quantity x (X ₁ - X ₀) / X ₀ (\$ CAN)
EX	EQUIPMENT - Propulsion System	XXX	\$ 1,000.00	100.0%	\$ 1,000.00	1	1	123.6	130	5.18%	\$ 51.78
	Structural		\$								
1	Hull/Deck Structure - Steel	SOW PARA 7.1.6 - Reference to T-005 Technical Baseline	\$	100%							
2	Deckhouse/Wheelhouse Structure - Aluminium	SOW PARA 7.1.6 - Reference to T-005 Technical Baseline	\$	100%							
	General										
3	AKA	SOW PARA 9.1 - System Integration	\$	100%							
4	Hawdbolt	SOW PARA 9.1 - System Integration	\$	100%							
	Deck Equipment										
5	A-Frame	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
6	Trawl Winches (2x)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
7	Crane	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
8	CTD Winch	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
9	Side J-Frame	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
10	Control Equipment (Chair, Console, Display)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
11	Powering (Associated electric deck equipment VFDs, or drives, with power regeneration)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
12	Sheaves	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
	Propulsion System										
13	Propulsion Drives (SRE 210LECFP)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
14	Propulsion Motors (2x)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
15	Accumulating Thrusters (STTR6)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
16	Diesel Electric Generators CAT C18 (2x)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
	Electrical										
17	Switchboards (2x) (900 and 480 VDC)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
18	Energy Storage System (ESS)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
19	Conversion equipment for ESS (chargers, inverters, converters and transformers)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
20	Power management and distribution software system	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
	Electronic										
21	Navigation echo sounder		\$	100%							
22	Differential global positioning system (DGPS)		\$	100%							
23	Scientific Fishing Echo Sounder (Simrad EK60)		\$	100%							
24	Scientific Fishing Sonar (Simrad S150)		\$	100%							
25	Multibeam hydrographic sonar (Kongsberg EM2040 MK3)		\$	100%							
	Control Systems										
26	Gyro Stabilizers (VEEM V5140/260SD) (2x)		\$	100%							
		Applicable Index*									
1	Machinery and equipment (P23)					Statistics Canada Table 18-10-0165-01: Industrial product price index, by major product group, monthly					
2	Electrical, electronic, audiovisual and telecommunications products (P23)					Statistics Canada Table 18-10-0165-01: Industrial product price index, by major product group, monthly					
3	Energy and electronic products (P23)					Statistics Canada Table 18-10-0165-01: Industrial product price index, by major product group, monthly					
4	Fabricated metal products and construction materials (P23)					Statistics Canada Table 18-10-0165-01: Industrial product price index, by major product group, monthly					

ANNEX R - Claim for Exchange Rate Adjustments and Exchange Rate Adjustment - PWGSC-TPSGC 450

1 Item No.	2a Description	2b Reference	3a Foreign Currency Component (FCC) per Unit (\$ CAN)	3b Percentage of Bid Price (%)	3c column 3a x column 3b (\$ CAN)	4 Foreign Currency	5 Quantity	6 Initial Exchange Rate (i ₀)	7 Exchange Rate for Adjustments(i ₁)	8 % Change (i ₁ - i ₀) / i ₀ (+/-)	9 Adjustment = FCC x (%) x Quantity x (i ₁ - i ₀) / i ₀ (\$ CAN)
EX	EQUIPMENT - Propulsion System	XXX	\$ 1,000.00	100.0%	\$ 1,000.00	US	1	1.25	1.4	12.00%	\$ 120.00
	Structural										
1	Hull/Deck Structure - Steel	SOW PARA 7.1.6 - Reference to T-005 Technical Baseline	\$	100%							
2	Deckhouse/Wheelhouse Structure - Aluminium	SOW PARA 7.1.6 - Reference to T-005 Technical Baseline	\$	100%							
	General										
3	AKA	SOW PARA 9.1 - System Integration	\$	100%							
4	Hawdbolt	SOW PARA 9.1 - System Integration	\$	100%							
	Deck Equipment										
5	A-Frame	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
6	Trawl Winches (2x)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
7	Crane	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
8	CTD Winch	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
9	Side J-Frame	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
10	Control Equipment (Chair, Console, Display)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
11	Powering (Associated electric deck equipment VFDs, or drives, with power regeneration)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
12	Sheaves	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/C	\$	100%							
	Propulsion System										
13	Propulsion Drives (SRE 210LECFP)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
14	Propulsion Motors (2x)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
15	Accumulating Thrusters (STTR6)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
16	Diesel Electric Generators CAT C18 (2x)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
	Electrical										
17	Switchboards (2x) (900 and 480 VDC)	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
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20	Power management and distribution software system	SOW PARA 9.1 - System Integration RFID Ref # F7013-200032/B	\$	100%							
	Electronic										
21	Navigation echo sounder		\$	100%							
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23	Scientific Fishing Echo Sounder (Simrad EK60)		\$	100%							
24	Scientific Fishing Sonar (Simrad S150)		\$	100%							
25	Multibeam hydrographic sonar (Kongsberg EM2040 MK3)		\$	100%							
	Control Systems										
26	Gyro Stabilizers (VEEM V5140/260SD) (2x)		\$	100%							

EX example:
 A machinery equipment component costs \$800 US, at an exchange rate of 1.25 USD -> CAD. Percentage = 100%
 $i_0 = 1.25$
 $FCC \text{ and } P_n = 800 \times 1.25 = \1000 CAD
 The Stats Canada index for machinery equipment on February 2022 is 123.6 (X₀)
 At the time of transaction, the USD -> CAD is 1.40 and the machinery index has increased to 130.
 $i_1 = 1.40$
 $X_0 = 123.6$
 $X_1 = 130$

 Economic Price Adjustment: $P_n \times (\%) \times Q_1 \times (X_1 - X_0) / X_0$:
 $\$1000 \times 100\% \times 1 \times (130.0 - 123.6) / 123.6 = \51.78 CAD

 Exchange Rate Adjustment: $FCC \times (\%) \times Q_1 \times (i_1 - i_0) / i_0$:
 $\$1000 \times 100\% \times 1 \times (1.40 - 1.25) / 1.25 = \120.00 CAD

 Total price adjustment = \$171.78 CAD