

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 0A1 / Noyau 0A1
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

Guideline revised RFP, all amendments remaining in effect.

Solicitation révisé comme guide, tous les avenants demeurant en effet.

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution

Marine Machinery and Services / Machineries et
services maritimes
11 Laurier St. / 11, rue Laurier
6C2, Place du Portage
Gatineau
Québec
K1A 0S5

| | |
|---|--|
| Title - Sujet REPAIR AND OVERHAUL SUPPORT SERVICE | |
| Solicitation No. - N° de l'invitation W8482-116492/A | Amendment No. - N° modif. 011 |
| Client Reference No. - N° de référence du client W8482-116492 | Date 2012-09-13 |
| GETS Reference No. - N° de référence de SEAG PW-\$\$ML-002-22827 | |
| File No. - N° de dossier 002ml.W8482-116492 | CCC No./N° CCC - FMS No./N° VME |
| Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2012-09-24 | Time Zone Fuseau horaire Eastern Daylight Saving Time EDT |
| F.O.B. - F.A.B. Plant-Usine: <input checked="" type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/> | |
| Address Enquiries to: - Adresser toutes questions à: Wright, Muriel | Buyer Id - Id de l'acheteur 002ml |
| Telephone No. - N° de téléphone (819) 956-4886 () | 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 |

**SOLICITATION AMENDMENT 011 IS ISSUED TO PROVIDE TO ALL BIDDERS
ADDITIONAL QUESTIONS AND ANSWERS RECEIVED DURING THE EXTENDED
BIDDING PERIOD.**

Question 1:

“... it is requested that a bidders conference be convened to allow prospective contractors the opportunity to express their reservations in an open forum.”

Answer 1:

There will be no bidders conference convened.

Question 2:

“..., it is requested that the current RFP be cancelled and replaced with a clean document incorporating all the changes.”

Answer 2:

An updated solicitation document follows. Annexes E, E-1 and F are incorporated therein. Annex A and Appendices 3, 6 and 7 to Annex A are included as separate documents.

Updates to reflect solicitation amendments are italicized between asteriks as follows:abc****

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PART 1 - GENERAL INFORMATION

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 statement of work;

Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to 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: includes the certifications 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 TSOW (Annex A), Forecast sheet, Logistics (Generic) SOWs, Basis of Payment/Price Grid and Evaluation Criteria.

2. Summary

The Department of National Defence (DND) has a requirement, on an as required basis and listed in four groups, to repair/overhaul and test a variety of pump assemblies or subassemblies used in various fluid systems onboard DND ships. Included in this requirement is performing modifications, conducting Special Investigations and Technical Studies (SITS), supplying Field Service Representatives/Mobile Repair Parties (FSR/MRP) and providing Technical Investigations and Engineering Support (TIES) for the stated equipment and their applicable systems. The requirement is for a period of three (3) years with two (2) one (1) year options and will require the contractor to be the Original Equipment Manufacturer (OEM) or have a current license or agreement with the OEM.

This procurement is subject to the Controlled Goods Program. There is no security requirement.

3. Debriefings

After contract award, bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within fifteen (15) working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

PART 2 - BIDDER INSTRUCTIONS

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 (<http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/acho-eng.jsp>) Manual 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 *2012-07-11* Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

The 2003, Standard Instructions - Goods or Services - Competitive Requirements, are amended as follows:

(a) Subsection 5.2.d

Delete: The facsimile number and related instructions for bids transmitted by facsimile are provided in Section 08;

(b) Subsection 5.4

Delete: sixty (60) days
Insert: ninety (90) days

(c) Subsection 7.2

Delete in its entirety

(c) Subsection 8

Delete in its entirety

1.1 SACC Manual Clauses

A9033T 2011-05-16 Financial Capability

2. 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 page 1 of the bid solicitation.

Due to the nature of the bid solicitation, bids transmitted by facsimile or via web-site (s) will not be accepted.

3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than ten (10) calendar days before the bid closing date. 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.

4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

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.

5. 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 twenty (20) days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid (4 hard copies) and 4 soft copies on CD

Section II: Management Bid (4 hard copies)

Section III: Financial Bid (1 hard copy)

Section IV: Certifications (4 hard copies)

If there is a discrepancy between the wording of the soft copy and the hard copy, the wording of hard copy number (1) will have priority over the wording of the soft copy.

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

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process Policy on Green Procurement (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>).

To assist Canada in reaching its objectives, bidders are encouraged to :

- (1) use paper containing fiber certified as originating from a sustain ably-managed forest and/or containing minimum 30% recycled content; and
- (2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical Bid

In their technical bid, bidders must demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders must demonstrate their capability and expertise to perform the required Major Repair and Overhaul to 'As New Condition' in order to achieve the maximum stipulated vibration and noise levels for each applicable NATO Stock Number (NSN). Furthermore, the bidder must demonstrate their capability for conducting Special Investigations and Technical Studies (SITS), supplying Field Service Representatives/Mobile Repair Parties (FSRs/MRPs) and providing Technical Investigations and Engineering Support (TIES) for the stated equipment. Bidders must describe their approach for carrying out the work in a thorough, concise and clear manner.

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.

- 1.1 The Scope of Work is, when requested, to complete an all inclusive major Repair and Overhaul (R&O) to 'As Good As New' condition and meet the maximum stipulated noise and vibration test results (Ref. Annex A, Appendix 3, 4, 5, 6 and 7), modify and/or reduce to spares, a variety of pump assemblies, subassemblies, prime movers, and their associated components. The Work will also include, when requested, Special Investigation and Technical Studies (SITS), Technical Investigations and Engineering Studies (TIES), supply of Field Service Representative (FSR) support or Mobile Repair Parties (MRPs) for the stated equipment and its applicable systems. These pumps are used in fluid systems onboard various Department of National Defence (DND) Ships. The equipment is predominantly pumps used in fresh and salt water, and in fuel and lube oil systems, but also includes some pumps from heating, ventilation, air-conditioning and other systems. The equipment is categorized into four groups which are listed in Appendices 4 to 7 in Annex A to this bid solicitation.

1.2 The following definitions shall apply to this bid solicitation:

"Technical Data" refers to the Technical Data Package (TDP) which includes all Original Equipment Manufacturer (OEM) data including Engineering Data and Drawings.

"Technical Information"= information provided by DND for bidding purposes only.

"R&O Specifications" refers to repair and overhaul specifications, and standards which delineate tolerances, repair procedures, etc., obtained from the OEM.

1.3 Bidders shall either possess or be capable of obtaining the Technical Data, the R&O Specifications and the capabilities necessary, prior to bid closing, to undertake and successfully complete all aspects of the R&O services described in this bid solicitation.

Bidders must clearly demonstrate in their bid that the Technical Data and R&O Specifications required will be available to them because: i) the Bidder is the Original Equipment Manufacturer (OEM) of the selected items; or, ii) the Bidder has a license or agreement with the relevant OEM for this Solicitation.

1.4 Canada shall not be held liable for providing to the Contractor any further technical information to the Equipment Performance Sheets for each item. Canada may provide limited technical information, if available, for bidding purposes only. The technical information may be subject to Limited Intellectual Property Rights and shall only be released to bidders provided they request such data, and provide certification of non disclosure to the Contracting Authority. This technical information for the pumps described herein, has been delivered to Canada under various contracts since 1960.

As the technical information has not been fully updated since that time, Canada is unable to, and does not warrant its accuracy or completeness. Canada shall not be responsible or liable for any damage or loss which may result from use of, or reliance on, this technical information. The Contractor shall acknowledge that it has no right to assert against Canada, any claim or demand based on the technical information resulting in failure to meet its obligations under the Contract, including without limitation its obligation to meet the Equipment Performance Specifications set out in Annex A of the Contract.

1.5 Canada shall also have the option to add R&O services, for any new naval pump item or for any naval pump item without contracted R&O services, to any resulting contract, at any time during the period of the contract at prices to be negotiated in accordance with the Basis of Payment.

1.6 It is acceptable to use subcontractors to perform part of, or all of the R&O services described in this bid solicitation; however, the relationship between the Bidder and the proposed subcontractor and division of the Work must be clearly indicated in the bid.

- 1.7 With the exception of Naval Engineering Test Establishment (NETE) testing facilities addressed hereunder, Bidders must demonstrate that they or their major subcontractors or partner have adequate facilities to perform the Work. Bidders must identify and describe the facilities and instrumentation to be used in the course of the Contract which will meet the requirements of the Technical and Logistic Statements of Work. Bidders/major subcontractors/partners shall have or shall make provision to have the use of testing installations and equipment for electric motors and pumps, as well as for steam turbine driven pumps, to suitably confirm performance and vibration output of overhauled pumps and motors in accordance with relevant specifications in their bid solicitation.
- 1.8 In responding to this solicitation, bidders must include in their bid a description of the vibration monitoring equipment, test loops, mounting arrangements, parameters to be measured, accuracy of instrumentation and provisions for calibration. In addition, bidders must include in their bid the plan they will follow for performance and vibration testing of the overhauled pumps and motors. Bidders/major subcontractors/partners shall have an installation capable of secure mounting pumps of approximate weight of 1200 kg, with resilient mounts and flexible connections in accordance with the Statement of Work. Bidders/major subcontractors/partners shall have a test loop with minimum pipe sized and capable to withstand peak pressure and flow rate expected of any of the equipment items identified.
- 1.9 Quality Plan

Bidders must submit their ISO *9001* Certificate or their Quality Assurance Plan with their bids for acceptance by the Department of National Defence (DND). The submitted Quality Plan shall be prepared according to the latest issue (at bid closing date) of ISO 10005 "Quality management - Guidelines for quality plans". The Quality Plan must be in the same format that will be used after award of contract. The Quality Plan shall describe how the Bidder/Contractor will conform to the specified quality requirements of the Solicitation and specify how the required quality activities are to be carried out, including quality assurance of subcontractors. The Bidder/Contractor must include a traceability matrix from the elements of the specified quality requirements to the corresponding paragraphs in the Quality Plan.

The Quality Plan may reference other documents. Where referenced documents do not already exist, but are required by the Quality Plan, the plan must identify them and also identify when, how and by whom they will be prepared and approved. The documents referenced in the Quality Plan must be made available when requested by Public Works and Government Services Canada or the Department of National Defence.

- 1.10 The services of NETE may be used by contractors for this requirement but will not be provided separately and free of charge nor on a priority basis by Canada. Should the Contractor elect to use NETE as its test facility, the Contractor is hereby forewarned that any delay in R&O Turn Around Time caused by NETE shall not be recognized as a delay caused by Canada and the Contractor shall remain solely and fully liable for such performance deficiencies. Bidders that elect to use NETE as the test facility for any of the pumps of this requirement should contact **the Contracting Authority, Muriel Wright**.

Bidders proposing NETE as a test facility shall provide separately from Annex E, for each pump tested at NETE, the details (including NETE quotes) of the testing costs included in their firm prices for verification by the Contracting Authority. Costs related to the transportation of pumps between NETE & the Contractor's facility are the responsibility of the Contractor.

2. Specifications

Unless otherwise specified, the following specifications of the issue in effect on the date of bid solicitation, shall form part of the contract at such time as any work requirement exists that falls within the terms of these specifications:

| | | |
|--------------------------------|--------------------------------|---------------------|
| D-LM-008-001/SF-001 | D-LM-008-036/SF-000 (90-06-11) | C-27-876-000/TD-001 |
| D-02-006-008/SG-001 (85-05-16) | D-03-002-006/SG-000 | C-27-877-000/TD-001 |
| A-LM-184-001/JS-001 | A-SJ-100-001/AS-000 | C-27-878-000/TD-001 |
| ISO 10012 (92-01-01) | C-02-005-011/AM-000 | C-27-879-000/TD-001 |
| ISO 9001:2008 | NATO STANAG 4107 (89-08-17) | C-27-880-000/TD-001 |
| | | C-27-931-000/TD-001 |

Canada shall only be responsible to distribute, upon written request from the Contracting Authority, the DND Specifications and Publications if called up in this bid solicitation. Bidders and contractors shall be responsible for obtaining any other specification or publication called up in this bid solicitation, whether commercially available or not, or originating from any other provincial, or Canadian government departments or agencies.

3. Materiel Supplied

3.1 Provision of all spare parts or components to enact repair and overhaul of items covered under the contract shall be the responsibility of the Contractor.

3.2 Canada will only accept parts that:

- (a) are supplied by the Original Equipment Manufacturer (OEM) or its authorized dealers or distributors, and/or are manufactured by the OEM or by an OEM-licensed manufacturer in accordance with the most recent OEM's drawings and/or specifications; and
- (b) have not formerly been declared as surplus or scrap by foreign or Canadian governments.

IT IS MANDATORY THAT BIDDERS CERTIFY IN WRITING THEIR COMPLIANCE TO 3.2 (a) & (b) ABOVE.

Section II: Management Bid

In their management bid, bidders must describe their capability and experience, with sufficient documentation to clearly demonstrate their years of experience in successfully completing major pump overhauls in each group of pumps selected and provide proof of capability to meet all requirements stipulated in this solicitation. The bidder must also describe the capability and experience of the management team and provide client contacts and contracts as requested in Annex F, Evaluation Criteria.

Section III: Financial Bid

1.1 **In Canadian currency**, Bidders must submit their financial bid in accordance with the Basis of Payment/Price Grid at **Annexes E and E-1**. The total amount of Goods and Services Tax or Harmonized Sales Tax must be shown separately, if applicable.

1.2 Exchange Rate Fluctuation

The requirement does not provide for exchange rate fluctuation protection. Any request for exchange rate fluctuation protection will not be considered and will render the bid non-responsive.

1.3 Fixed Rate Price Increases Based on Consumer Price Index (CPI)

The first year prices as submitted in Annex E 'Price Grid' will be the base year for subsequent year 2 prices (Year 2 will be base year for Year 3 and so on) and will be adjusted annually based on the average monthly CPI change for past 12 months, month 4 to 15 prior to contract date using the Consumer Price Index Table 326-0020, 2009 Basket, monthly from Statistics Canada.

(i) Example Year 2 Pricing:

First year fixed price for NSN 123-456-789 = \$25,000.00 as per completed Annex E with contract issue date of 2011.09.15 .

Price increase will be average rate from Table 326-0020 (monthly) in past 12 months from July 2010 to June 2011.

The Revised Year 2 rate = Current Price X (1 + % Average CPI Increase past 12 months)

(ii) Year 3 and option years:

The revised Rates(s) = Year 2 Pricing X (1 + % CPI Rate Increase)

Section IV: Certifications

Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the "technical", "management" and "financial" evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

1.1 Technical Evaluation

Mandatory and point rated technical evaluation criteria including minimum score required to pass the evaluation are included in Annex F.

1.2 Management Evaluation

Mandatory and point rated technical evaluation criteria are included in Annex F.

1.3 Financial Evaluation

1.3.1 Mandatory Financial Criteria

- (a) Per group of pumps referenced in Annex B, it is mandatory to submit a bid price for all NATO Stock Numbers (NSN) listed in each group. Failure to submit a price for a NSN in a group will render the bid non-responsive for that particular group.
- (b) The 1st year prices are set as per the completed schedule Annex E.

2. Basis of Selection

2.1 To be declared responsive, a bid must:

- (a) comply with all the requirements of the bid solicitation; and
- (b) meet all mandatory technical evaluation criteria; and
- (c) obtain a minimum score of 30 points overall for the technical evaluation criteria which is subject to point rating. The rating is performed on a scale of 50 points.

- 2.2 Bids not meeting (a) or (b) or (c) will be declared non-responsive. For each Group of pumps, the responsive bid with the lowest evaluated price will be recommended for award of a contract.
- 2.3 The total evaluated price per Group of Pumps (1, 2, 3 or 4) will be calculated as follows:
- (a) For each NSN, the bid price for Major Overhaul will be multiplied by the forecasted quantity for year 2012 indicated in Annex B (for evaluation purposes only, any NSN with forecast quantity = 0 will be replaced with a quantity of 1) and a sum total of each calculated NSN amount will be calculated; and
 - (b) The Firm Hourly Labour Rate for Modifications and Reduction to Spares will be multiplied by a factor of 200 to obtain a 2nd total; and
 - (c) The Firm Composite Hourly Labour rate for TSOW 3.2.5, 3.2.6, 3.2.7 & 3.2.8 activities will be multiplied by a factor of 200 to obtain a 3rd total;
 - (d) The Firm price to apply ceramic coating (if applicable), multiplied by a factor of 10 will be calculated to obtain a 4th total;
 - *(e) *For each NSN, the bid price for Basic Overhaul will be multiplied by the forecasted quantity for year 2012 indicated in Annex B (for evaluation purposes only, any NSN with forecasted quantity = 0 will be replaced with a quantity of 1) and a sum total of each calculated NSN amount will be calculated to obtain a fifth total;*
 - (f) *addition of 13 firm prices provided at Annex E-1, Firm Fixed Prices for Repair of Re-Usable Components to obtain a sixth total; and,*
 - (g) *average of firm fixed prices quoted for add-ons to obtain a seventh total.*

For each Group of Items, the lowest sum total dollar value of (a) through (g), above, will determine the lowest evaluated price.

- 2.4 *The bidder with the lowest evaluated price amongst those bidding on the same group of pumps will be awarded a contract for that group of pumps. A bidder may be awarded more than one contract.**

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications to be awarded a contract. Canada will declare a bid non-responsive if the required certifications are not completed and submitted as requested. Compliance with the certifications bidders provide to Canada is subject to verification by Canada during the bid evaluation period (before award of a contract) and after award of a contract. The Contracting Authority will have the right to ask for additional information to verify bidders' compliance with the certifications before award of a contract. The bid will be declared non-responsive if any certification made by the Bidder is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

1. Certifications Required with the Bid

Bidders must submit the following duly completed certification(s) as part of their bid.

1.1 Federal Contractors Program (FCP)

The Federal Contractors Program (FCP) requires that some suppliers, including a supplier who is a member of a joint venture, bidding for federal government contracts, valued at \$200,000 or more (including all applicable taxes), make a formal commitment to implement employment equity. This is a condition precedent to contract award. If the Bidder, or, if the Bidder is a joint venture and if any member of the joint venture, is subject to the FCP, evidence of its commitment must be provided before the award of the Contract.

Suppliers who have been declared ineligible contractors by Human Resources and Skills Development Canada (HRSDC) are no longer eligible to receive government contracts over the threshold for solicitation of bids as set out in the Government Contracts Regulations. Suppliers may be declared ineligible contractors either as a result of a finding of noncompliance by HRSDC, or following their voluntary withdrawal from the FCP for a reason other than the reduction of their workforce to less than 100 employees. Any bids from ineligible contractors, including a bid from a joint venture that has a member who is an ineligible contractor, will be declared non-responsive.

If the Bidder does not fall within the exceptions enumerated in 3.(a) or (b) below, or does not have a valid certificate number confirming its adherence to the FCP, the Bidder must fax (819-953-8768) a copy of the signed form LAB 1168, Certificate of Commitment to Implement Employment Equity, to the Labour Branch of HRSDC.

The Bidder, or, if the Bidder is a joint venture the member of the joint venture, certifies its status with the FCP, as follows:

The Bidder or the member of the joint venture

- (a) () is not subject to the FCP, having a workforce of less than 100 full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada;
- (b) () is not subject to the FCP, being a regulated employer under the Employment Equity Act, S.C. 1995, c. 44;
- (c) () is subject to the requirements of the FCP, having a workforce of 100 or more full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada, but has not previously obtained a certificate number from HRSDC (having not bid on requirements of \$200,000 or more), in which case a duly signed certificate of commitment is attached;
- (d) () is subject to the FCP, and has a valid certificate number as follows: _____ (e.g. has not been declared an ineligible contractor by HRSDC.)

Further information on the FCP is available on the HRSDC Web site.

***2. Code of Conduct Certifications - Consent to a Criminal Record Verification**

2.1 Bidders must submit with their bid, by the bid solicitation closing date:

- (a) a complete list of names of all individuals who are currently directors of the Bidder;
- (b) a properly completed and signed form *Consent to a Criminal Record Verification (PWGSC-TPSGC 229)*, for each individual named in the list.*

PART 6 - FINANCIAL AND OTHER REQUIREMENTS

1. Financial Capability

SACC Manual clause A9033T 2011-05-16 Financial Capability

2. SACC Manual Clauses

A9130T 2011-05-16 Controlled Goods Program

PART 7 - RESULTING CONTRACT CLAUSES

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

1. Requirement

- 1.1 The Department of National Defence (DND) has a requirement, on an as required basis and listed in four groups, to repair/overhaul and test a variety of pump assemblies or subassemblies used in various fluid systems onboard DND ships. Included in this requirement is performing modifications, conducting Special Investigations and Technical Studies (SITS), supplying Field Service Representatives/Mobile Repair Parties (FSR/MRP) and providing Technical Investigations and Engineering Support (TIES) for the stated equipment and their applicable systems.
 - 1.1.1 The Contractor shall perform the Work at the Contractor's or Subcontractor's Plant or on-site by MRP, in accordance with the Technical Statement of Work (TSOW) at Annex A, with the Logistic Statements of Work attached hereto as Annexes C and D, respectively, and with the Contractor's technical bid entitled _____, dated _____.
 - 1.1.2 **There is no security requirement.**
 - 1.1.3 The Contractor shall be responsible for undertaking and completing all work as requested.
 - 1.1.4 The Contractor shall be responsible for providing all repair tools and test equipment.
 - 1.1.5 The Contractor possesses all Technical Data and R&O Specifications required to carry out the Work because: i) the Contractor is the Original Equipment Manufacturer (OEM) of the selected items; or, ii) the Contractor has a license or agreement with the relevant OEM for this requirement.
 - 1.1.6 The Contractor shall supply all repair and replacement parts required for the major repair and overhaul of the equipment listed as Contractor Furnished Material (CFM) and the timely provision of parts to meet the requested Turn Around Time (TAT) shall be the responsibility of the Contractor. However, for parts requiring long lead time, DND reserves the right to purchase parts as required. Every case will be reviewed by DND to evaluate the impact of the unavailability of the end item versus the operational requirement. Parts shall be used and stocked by the Contractor during the course of the Contract. Additional parts shall only be procured with the prior authorization of the Technical Authority and the Requisitioning Authority. After contract completion, the remaining stock shall be properly identified, packaged and delivered to DND as spares.

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- 1.1.7 DND holds an inventory of spare parts associated with this requirement and wishes to make these spares available at certain conditions to the Contractor until full depletion of the inventories. All requests for Canadian Forces Supply Stock (CFSS) by the Contractor will be sent to the Requisitioning Authority for approval prior to ordering from NDQAR authority. There is no incentive basis of payment; the full market value of the item ordered from CFSS will be subtracted from the contract fixed price of the item being overhauled.
- 1.1.8 Canada has the option to add R&O services, if required, for any new naval pump item or for any naval pump item without contracted R&O services at any time during the period of the contract at prices to be negotiated in accordance with the Basis of Payment.
- 1.1.8.1 The Contractor is authorized to evaluate the condition of any naval pump item or auxiliary equipment, on a time and material basis in accordance with Basis of Payment of the Contract, up to a maximum of 10 % of the Maximum Repair Cost (MRC) of the item.
- 1.1.8.2 In the event that the maximum of 10% of the MRC has been reached and the Contractor deems that further evaluation is required, the Contractor must seek authorization to proceed from the Requisitioning Authority. If authorization to proceed with further evaluation is granted, the Requisitioning Authority will advise the Contractor of the new maximum percentage of the MRC which must not be exceeded.
- 1.1.8.3 Beyond Economical Repair
- For any item considered to be Beyond Economical Repair (BER), Canada shall pay the Contractor for all work performed up to that point, on a time and material basis in accordance with the Basis of Payment, up to a maximum of 10% of the MRC for the work and costs undertaken for stripping, inspection and assessment. In the event that the Contractor was authorized to proceed with the evaluation and that a new maximum percentage was established by the Requisitioning Authority, Canada shall pay the Contractor for all work performed up to that point on a time and material basis in accordance with the Basis of Payment, up to a maximum of the newly established percentage of the MRC.
- 1.1.9 The Work shall be broken down into two categories of work. Category 1 will consist of Repair & Overhaul (R&O) and Category 2 will consist of Mobile Repair Party (MRP), Special Investigation and Technical Studies (SITS), Technical Investigation and Engineering Studies (TIES) and Disposal.

1.1.9.1 Additional information:

- A. TIES: This activity includes the provision of system and equipment maintenance support and management services. It includes the requirement analysis and planning to ensure current reliability and availability specifications can be met, the scheduling of maintenance, the identification of spares and support, as well as the development of policies and maintenance procedures. It also includes the contract management activities as well as validation/acceptance of deliverables when the maintenance activity is contracted;

The R&O category covers modifications of the equipment or system (from the OEM standard) which DND specifically request, e.g. a DND-sponsored modification, DND-approved "optional extras" or incorporation of optional OEM service bulletins, to which DND agrees.

"Involuntary" modifications, although they may require DND's knowledge and approval, are not considered "Engineering Change". Rather, they shall be coded as R&O.

Examples:

- replacing a part which is no longer produced, with OEM's substitute part; or
- incorporation of compulsory service bulletins; or
- updating an early configuration to the OEM's current baseline standard.

- B. SITS: See section 3.5 of Annex C of this bid solicitation.
- C. Disposal: This activity includes all disposal-related aspects of removing existing systems from service as well as the physical disposal of assets. It includes disposal option analysis, the preparation of disposal plans, identification of surplus equipment and disposal of equipment/systems and fleet, ensuring that safety and environmental requirements are addressed. It also includes the contract management activities, if any, if the disposal activity is contracted

.2 Authorizations

1.2.1 Supply Accounting (for Category 1 work)

The Contractor shall repair and/or overhaul only those items for which it has received authorization in accordance with the relevant section of A-LM-184-001/JS-001. The Contractor shall also conform to the direction contained in A-LM-184-001/JS-001 as applicable and such other Supply procedures as may be advised from time to time in the demanding, handling, packaging, storing, shipping and recording etc. of the DND equipment and stores in his possession. Overhaul/repair priorities will be maintained as per information provided in the Selection Notice and Priority Summary (SNAPS).

1.2.2 Requirement for use of DND 626 Task Authorization (for Category 2 work)

DND will raise DND 626 Task Authorizations to authorize work under the contract for some or all of the required services. The requested DND approval limit for each DND 626 is \$35,000.00 with an amendment limit of 50% of the original value. Tasks over this limit will be passed to the Contracting Authority for review and where applicable to negotiate a reasonable cost savings with the Contractor. On completion of the review/ negotiation the Contracting Authority will then provide DND with the Contractor's new quote, if applicable, and the authorization to proceed by approving the DND 626.

1.2.3 Task Authorization - Administration

The administration of the Task Authorization process will be carried out by D Mar P 3-4-4 . This process includes monitoring, controlling and reporting on expenditures of the contract with task authorizations to the Contracting Authority.

1.2.4 Task Authorization (TA)

The Work or a portion of the Work to be performed under the Contract will be on an "as and when requested basis" using a Task Authorization (TA). The Work described in the TA must be in accordance with the scope of the Contract.

1.2.5 Task Authorization Process

1.2.5.1 The Project Authority will provide the Contractor with a description of the task using the DND 626 Task Authorization Form.

1.2.5.2 The Task Authorization (TA) will contain the details of the activities to be performed, a description of the deliverables, and a schedule indicating completion dates for the major activities or submission dates for the deliverables. The TA will also include the applicable basis and methods of payment as specified in the Contract.

1.2.5.3 The Contractor must provide the Project Authority, within seven (7) calendar days of its receipt, the proposed total estimated cost for performing the task and a breakdown of that cost, established in accordance with the Basis of Payment specified in the Contract.

1.2.5.4 The Contractor must not commence work until a TA authorized by the Project Authority has been received by the Contractor. The Contractor acknowledges that any work performed before a TA has been received will be done at the Contractor's own risk.

1.2.6 Authority to carry out work shall not be construed as authority to proceed with work which will result in exceeding the financial limitation of the contract.

1.3 Performance and Reliability

Equipment, overhauled or repaired in accordance with the terms of the contract, will be produced to meet the military and marine standards of performance and reliability. When such standards are not described or when the standards described are considered by the contractor to be inadequate, the Contractor will submit the standards of performance and reliability to which it proposes to overhaul/repair the equipment through the Quality Assurance Representative (QAR) to the Technical Authority for DND approval.

1.4 Specifications

Unless otherwise specified, the following specifications of the issue in effect on the date of bid solicitation, shall form part of the contract at such time as any work requirement exists that falls within the terms of these specifications:

D-LM-008-001/SF-001

D-02-006-008/SG-001 (85-05-16)

A-LM-184-001/JS-001

ISO 10012 (92-01-01)

ISO 9001:2008

D-LM-008-036/SF-000 (90-06-11)

D-03-002-006/SG-000

A-SJ-100-001/AS-000

C-02-005-011/AM-000

NATO STANAG 4107 (89-08-17)

C-27-876-000/TD-001

C-27-877-000/TD-001

C-27-878-000/TD-001

C-27-879-000/TD-001

C-27-880-000/TD-001

C-27-931-000/TD-001

The Contractor acknowledges that it has no right to assert against Canada, any claim or demand based on the technical information resulting in impossibility of performance of its obligations under the Contract, including without limitation its obligation to meet the Equipment Performance Specifications set out in Annex A of the Contract.

1.5 Materiel Supplied

1.5.1 Provision of all spare parts or components to enact repair and overhaul of items covered under the contract shall be the responsibility of the Contractor.

1.5.2 Canada will only accept parts that:

- (a) are supplied by the Original Equipment Manufacturer (OEM) or its authorized distributors or dealers, and/or are manufactured by the OEM or by an OEM-licensed manufacturer in accordance with the most recent OEM's drawings and/or specifications; and
- (b) have not formerly been declared as surplus or scrap by any foreign or Canadian government.

1.6 Parts Serviceability

When any doubts exists as to the serviceability of parts or components not requiring mandatory replacement, parts or components shall be repaired, overhauled, or replaced by new. If in the event that a part is unavailable, the use substitutions or reuse of removed components must be specifically agreed to in writing, in advance, by the Technical Authority. The decision to repair, overhaul, or replace parts or components shall be left to the Contractor and the cost of such work shall be included in the firm fixed price for the major overhaul of the item, shall not affect the terms of warranty for the item and the stipulated mandatory performance requirements specified in Appendices 4-7 of Annex A.

1.7 Testing Requirements

The testing requirements of TSOW subsections 3.3.12, 3.3.13, 3.3.14, 3.3.15 and 3.3.16 shall be the responsibility of the Contractor and, except for TSOW 3.3.16 related work, all testing costs shall be included in the firm fixed price for the repair of each item as per the Basis of Payment.

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 (<http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/acho-eng.jsp>) Manual issued by Public Works and Government Services Canada.

2.1 General Conditions

2035 *2012-07-11*, General Conditions - Higher Complexity - Services

3. **Term of Contract**

3.1 Period of the Contract

The period of the Contract is from date of Contract to _____ inclusively.

3.2 Option to Extend the Contract

The Contractor grants to Canada the irrevocable option to extend the term of the Contract by up to two (2) additional one (1) year periods under the same conditions. The Contractor agrees that, during the extended period of the Contract, it will be paid in accordance with the applicable provisions as set out in the Basis of Payment.

Canada may exercise this option at any time by sending a written notice to the Contractor at least 30 calendar days before the expiry date of the Contract. The option may only be exercised by the Contracting Authority, and will be evidenced for administrative purposes only, through a contract amendment.

4. Authorities

4.1 Contracting Authority

The Contracting Authority for the Contract is:

Muriel Wright, Supply Specialist
Public Works and Government Services Canada (PWGSC)
Acquisitions Branch, Marine Sector
Marine Systems Directorate, "ML" Division
6C2, Place du Portage, Phase III
11 Laurier St., Gatineau, Qc, K1A 0S5
Telephone: 819-956-4886; Facsimile: 819-956-0897
E-mail: muriel.wright@pwgsc-tpsgc.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.

4.2 Project Authority

The Project Authority for the Contract is:

National Defence Headquarters
Maj Gen George R. Pearkes Bldg
101 Colonel By Drive
Ottawa, Ontario, K1A 0K2
Attention: D Mar P 3-4-4
Tel: 819-994-8985; Facsimile: 819-994-7489

The Project 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 Project Authority; however, the Project 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.

4.3 Technical Authority

The Technical Authority, to be advised once a contract is awarded, is responsible for technical aspects related to the requirement.

4.4 Quality Assurance Authority/Inspection Authority

The Quality Assurance Authority/Inspection Authority will be advised once a contract is awarded.

4.5 CFQAR

The CFQA Representative will be advised once a contract is awarded.

4.6 Contractor's Representative

5. **Payment**

5.1 Basis of Payment

5.1.1 In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid in accordance with the Basis of Payment, as specified in **Annexes E and E-1**. Customs duties are included and Goods and Services Tax or Harmonized Sales Tax extra, if applicable.

5.1.2 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.

5.2 Basis of Payment - Task Authorizations

5.2.1 The Contractor will be reimbursed for the costs reasonably and properly incurred in the performance of the Work specified in the authorized Task Authorization (TA), as determined in accordance with the Basis of Payment in Annex E to the limitation of expenditure specified in the authorized TA.

- 5.2.2 Canada's liability to the Contractor under the authorized TA must not exceed the limitation of expenditure specified in the authorized TA. Customs duties are included and Goods and Services Tax or Harmonized Sales Tax extra, if applicable.
- 5.2.3 No increase in the liability of Canada or in the price of the Work specified in the authorized TA resulting from any design changes, modifications or interpretations of the Work will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been authorized, in writing, by the Contracting Authority before their incorporation into the Work.
- 5.3 Yearly Consumer Price Index Increase

Yearly Price Increases from Base Year 1 (Prices submitted on Price Grid) will be based on the Fixed rate Consumer Price Index (CPI) increase.

The first year prices, as submitted in Annex E 'Price Grid' will be the base year for subsequent years price increases (Year 2 will be base year for Year 3 and so on) and will be adjusted annually based on the average monthly CPI change over 12 months starting with 3rd month prior to contract date. Consumer Price Index Table 326-0020, 2009 Basket, monthly from Statistics Canada.

(i) Example Year 2 Pricing:

First year fixed price for NSN 123-456-789 = \$25,000.00 as per completed Annex E with contract issue date of 2011.09.15 .

Price increase percentage will be the average rate increase from Table 326-0020 (monthly) from previous 12 months from May 2010 to June 2011.

The Revised Year 2 rate = Current Price X (1 + % CPI Average Rate Increase)

5.4 Limitation of Expenditure

- 5.4.1 Canada's total liability to the Contractor under the Contract must not exceed \$22,650,000.00 . Customs duties are included, and Goods and Services Tax or Harmonized Sales Tax extra, if applicable.

5.4.2 No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Work, will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority before their incorporation into the Work. The Contractor must not perform any work or provide any service that would result in Canada's total liability being exceeded before obtaining the written approval of the Contracting Authority. The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:

- (a) when it is 75 percent committed, or
- (b) four (4) months before the contract expiry date, or
- (c) as soon as the Contractor considers that the contract funds provided are inadequate for the completion of the Work, whichever comes first.

5.4.3 If the notification is for inadequate contract funds, the Contractor must provide to the Contracting Authority a written estimate for the additional funds required. Provision of such information by the Contractor does not increase Canada's liability.

5.5. Canada's Obligation - Portion of the Work - Task Authorizations

SACC Manual Clause, B9031C 2011-05-16

5.6. Limitation of Price

SACC Manual clause C6000C 2011-05-16

5.7. Multiple Payments

SACC Manual clause H1001C 2008-05-12 Multiple Payments

6. **Invoicing Instructions**

Invoices cannot be submitted until all work identified in the invoice is completed.

6.1 Invoices will be submitted as follows:

For category 1 work:

Invoices shall clearly identify the “*firm fixed price for overhaul OR*” the following, if applicable:

-
- a. DND financial coding;
 - b. contract serial number;
 - c. details of items repaired including:

- NSN

- Description of item

- Labour hours and rate of payment

- Materiel costs

- Other applicable costs

- Work order numbers

- Stock holding code change notification document number

- GST/HST.

- d. Copy of NETE Testing Invoice (if applicable)

For Category 2 work:

Invoices shall be submitted as specified in each DND 626 Requisition on Contract. Invoices shall clearly identify the following:

- a. DND financial coding as quoted in the tasking;
- b. contract serial number;
- c. task authorization requisition number;
- d. engineering or technical support classification;
- e. rate of payment;
- f. ceiling number of hours applicable to task, if applicable;
- g. cost of materials related to the task; and
- h. approved travel and living expenses related to the task (receipts required);
- i. GST/HST.

- 6.2 Payment will only be made on receipt of satisfactory invoices duly supported by specified release documents and other documents called for under the terms of the contract.

Supporting documentation for any Travel & Living charges (hotel receipts, rental car, parking...) must be included with the invoice.

- 6.3 Invoices must be distributed as follows:

- (a) The original and one (1) copy, with attachments, must be forwarded to:

National Defence Headquarters
Maj Gen George R. Pearkes Bldg
101 Colonel By Drive
Ottawa, Ontario, K1A 0K2

Attention: D Mar P 3-4-4

- (b) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

7. Certifications

- 7.1 Compliance with the certifications provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification or it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

8. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____.

9. 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.

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- (a) the Articles of Agreement;
 - (b) the General Conditions 2035 2012-07-11 - Higher Complexity - Services;
 - (c) Annex A, Technical Statement of Work (TSOW) and Appendices 1 thru 8 to Annex A;
 - (d) Annex B, Groups of Pumps & Forecasts;
 - (e) Annex C, Logistics (Generic) Statement of Work for Free Flow (Components) for Repair and Overhaul;
 - (f) Annex D, Logistics (Generic) Statement of Work for Accountable Advance Spares/ Bonded Inventory for Repair and Overhaul;
 - (f) Annex E, Basis of Payment/Price Grid;
 - (g) the signed Task Authorizations (including all of its annexes, if any) (if applicable); and
 - (h) the Contractor's bid dated _____ (insert date of bid) (If the bid was clarified or amended, insert at the time of contract award:", as clarified on _____" or ", as amended on _____" and insert date(s) of clarification(s) or amendment(s)).

10. Defence Contract

SACC Manual clause A9006C 2008-05-12 Defence Contract

11. Insurance

SACC Manual clause G1005C 2008-05-12 Insurance

12. Controlled Goods Program

SACC Manual clause A9131C 2011-05-16, Controlled Goods Program

12.1 Controlled Goods

SACC Manual clause B4060C 2011-05-16 , Controlled Goods

Note: There are no controlled items associated with this requisition at this time, however this may be subject to change should new equipment/material be added to this requirement.

13. Inspection and Acceptance

13.1 Quality Plan

13.1.1 No later than _____ days after the effective date of the Contract, the Contractor must submit for acceptance by the Department of National Defence (DND) a Quality Plan prepared according to the latest issue (at contract date) of ISO 10005:2005 "Quality management systems - Guidelines for quality plans". The Quality Plan 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 Quality Plan.

13.1.2 The documents referenced in the Quality Plan must be made available when requested by Public Works and Government Services Canada or DND.

13.1.3 If the Quality Plan was submitted as part of the bidding process, the Contractor must review and, where appropriate, revise the submitted plan to reflect any changes in requirements or planning which may have occurred as a result of pre-contract negotiations.

13.1.4 Upon acceptance of the Quality Plan by DND, the Contractor must implement the Quality Plan. The Contractor must make appropriate amendments to the Quality Plan throughout the term of the contract to reflect current and planned quality activities. Amendments to the Quality Plan must be acceptable to DND.

13.1.5 If the Contract includes the option for software design, development or maintenance of software, the Contractor must interpret the requirements of ISO 9001:2008 "Quality management systems - Requirements", according to the guidelines of the latest issue (at contract date) of ISO/IEC 90003:2004 "Software engineering - Guidelines for the application of ISO 9001:2000 to computer software".

13.2 Quality Assurance Authority

D5510C 2011-05-16 Quality Assurance Authority (DND) - Canadian-based Contractor

13.3 Quality Management Systems - Requirements (QAC Q)

D5540C 2010-08-16 ISO 9001:2008 Quality Management Systems - Requirements (QAC Q)

13.4 Release Documents - Contractor

D5606C 2007-11-30 Release Documents (DND) - Canadian-based Contractor

13.5 Release Documents - Distribution

The Contractor must prepare the release documents in a current electronic format and distribute them as follows:

- (a) Copy 1: mail to consignee marked: "Attention: Receipts Officer";
- (b) Copies 2 and 3: with shipment (in a waterproof envelope) to the consignee;
- (c) Copy 4: to the Contracting Authority;
- (d) Copy 5: to:

National Defence Headquarters
Mgen George R. Pearkes Building
101 Colonel By Drive
Ottawa, ON K1A 0K2

Attention: D Mar P 3-4-4

- (e) Copy 6: to the Quality Assurance Representative;
- (f) Copy 7: to the Contractor;
- (g) Copy 8: all non-Canadian contractors to:

DQA/Contract Administration
National Defence Headquarters
Mgen George R. Pearkes Building
101 Colonel By Drive
Ottawa, ON K1A 0K2
E-mail: ContractAdmin.DQA@forces.gc.ca.

14. Preparation for Delivery

14.1 Packaging and Preservation

After final acceptance, overhauled equipment shall be mounted on flexible mounts, preserved and crated in accordance with the requirements of D-LM-008-001/SF-001 and returned to the Canadian Forces Supply System.

- 14.2 Therefore, all pump assemblies and subassemblies shall be packaged to a "Level B Limited Military Pack" with the Contractor selecting the appropriate cleaning method, drying procedure and preservative coating for the application. The preservation method shall be to Sub-method IIa of method II, Water-Vapour proof Enclosure with Desiccant (with Preservative as required). Method III, Packaging for Mechanical and Physical Protection, is required in addition to the previously specified requirement. Reuse/salvaging of the original shipping crate is acceptable, however, the Contractor shall have final responsibility for the adequacy of the shipping container.
- 14.3 The Contractor shall determine the most appropriate preservation and packaging method for individual components overhauled separately from the item assembly by following Annex A of D-LM-008-001/SF-001.
- 14.4 Where a requirement to repair, replace or provide a reusable container or other packaging material has been identified, the Contractor must submit an estimate of all costs and a description of the work to be performed to the DND Requisitioning Authority. The Contractor must also receive the RA's written approval prior to performing the work. Upon receipt of the RA's approval, the Contractor will perform the work on a time and material basis, using applicable rates.

15. Shipping Instructions (DND) - Canadian-based Contractor

- 15.1 Delivery will be FCA Free Carrier at the Contractor's facility Incoterms 2000. The Contractor must load the goods onto the carrier designated by the Department of National Defence (DND). Onward shipment from the delivery point to the consignee will be Canada's responsibility.
- 15.2 Before shipping the goods, the Contractor must contact the following DND Inbound Logistics Coordination Center by facsimile or e-mail, to arrange for shipment, and provide the information detailed at paragraph 3.

- (a) Insert the following for all repair and overhaul contracts where the Contractor is located between Kingston inclusive and westward to the Ontario/Manitoba border:

Inbound Logistics Central Area (ILCA)

Telephone: 1-866-371-5420 (toll free)

Facsimile: 1-866-419-1627 (toll free)

E-mail: ILCA@forces.gc.ca

OR

- (b) Insert the following for all repair and overhaul contracts where the Contractor is located in Manitoba, Saskatchewan, Alberta, British Columbia, and the National Capital Region inclusive to east of Kingston:

Inbound Logistics Coordination Center (ILCC)

Telephone: 1-877-877-7423 (toll free)

Facsimile: 1-877-877-7409 (toll free)

E-mail: ILHQOttawa@forces.gc.ca

OR

- (c) Insert the following for all repair and overhaul contracts where the Contractor is located in Quebec:

Inbound Logistics Quebec Area (ILQA)

Telephone: 1-866-935-8673 (toll free), or 1-514-252-2777, ext. 2323, 2852 or 4673

Facsimile: 1-866-939-8673 (toll free), or 1-514-252-2911

E-mail: 25DAFCTrafficQM@forces.gc.ca

OR

- (d) Insert the following for all repair and overhaul contracts where the Contractor is located in Atlantic (New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador):

Inbound Logistics Atlantic Area (ILAA)

Telephone: 1-902-427-1438

Facsimile: 1-902-427-6237

E-mail: FLogILAA@forces.gc.ca

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- 15.3 The Contractor must provide the following information to the DND Inbound Logistics Coordination Center when arranging for shipment:
- (a) the Contract number;
 - (b) consignee address (for multiple addresses, items must be packaged and labelled separately with each consignee address);
 - (c) description of each item;
 - (d) the number of pieces and type of packaging (i.e., carton, crate, drum, skid);
 - (e) actual weight and dimensions of each piece type, including gross weight;
 - (f) full details of dangerous material, as required for the applicable mode of transportation, signed certificates for dangerous material as required for shipment by the International Maritime Dangerous Goods Code, the International Air Transport Association regulations or the applicable Canadian Dangerous Goods Shipping Regulations, and a copy of the materiel safety data sheet.
- 15.4 Following receipt of this information by Canada, Canada will provide the appropriate shipping instructions, which may include the requirement for specific consignee address labelling, and the marking of each piece with a Transportation Control Number.
- 15.5 The Contractor must not ship the goods before receiving shipping instructions from the DND Inbound Logistics contact.
- 15.6 If the Contractor delivers the goods at a place and time which are not in accordance with the given delivery instructions or fail to fulfill reasonable delivery instructions given by Canada, the Contractor must reimburse Canada any additional expenses and costs incurred.
- 15.7 If Canada is responsible for delays in delivering the goods, ownership and risk will be transferred to Canada upon expiry of either thirty (30) days following the date on which a duly completed shipping application is received by Canada or by its appointed forwarding agent, or thirty (30) days following the delivery date specified in the Contract, whichever is later.

16. Identification Marking

All equipment assemblies or components, after overhaul or reconditioning shall have the original marking information and serial numbers restored and shall have the following information added immediately adjacent to the original identification markings or previous reconditioning markings: Reconditioner's Identification, Date of Reconditioning, Date of expiration of Warranty and Inspector's stamp/number.

17. Urgent Requirements

The Contractor shall be prepared to take immediate action to satisfy DND urgent requirements, as and when required by the authorized representative of the Project Authority.

18. Reports

18.1 Pre-Overhaul Inspection Report

The contractor shall submit a pre-overhaul inspection report in accordance with TSOW 4.1.

18.2 Reports Category 1

18.2.1 The Contractor shall submit to the Requisitioning Authority two copies of a Quarterly Summary Report, one hard copy and one soft copy in Microsoft EXCEL. This report shall consist of all equipment completed in the previous three months and shall include: item name, NSN, EAC, model #'s, serial #'s, cause of failure/major defects, date received, date completed and revised turn around time with justification. If available (from condition tag), the ship from which the equipment was removed, and the date, shall also be provided. The cost in the Quarterly Summary Reports shall be included in the all inclusive, firm fixed prices for Major Overhauls.

18.2.2 The Contractor shall submit two copies of the "final test report", one hard copy and one soft copy in Microsoft WORD, in accordance with TSOW 4.3. The cost of the "final test report" shall be included in the all inclusive, firm fixed price for Major Overhaul for each item.

18.2.3 The Contractor shall submit two copies of the "data sheets", one hard copy and one soft copy in Microsoft EXCEL, in accordance with TSOW 4.2. The cost of submitting the data sheets shall be included in the firm fixed price for HALIFAX Class additional airborne noise and vibration testing for each item.

18.3 Reports Category 2

18.3.1 The requirement for progress reports and final reports shall be specified in the Statement of Work appended to the DND 626. In addition to the copies required by the Technical Authority, one copy shall be delivered to the Contracting Authority. The cost of such reports shall be included in the negotiated price for the relevant DND 626 tasking.

18.3.2 The Contractor shall submit, at no additional cost to Canada, two copies of a MRP or FSR or SITS Completion Report, one hard copy and one soft copy in Microsoft WORD, in accordance with TSOW 4.3.

18.3.3 The Contractor shall submit, at no additional cost to Canada, such other reports with respect to the work as requested by DND.

19. Meetings

19.1 Progress meetings, chaired by the Contracting Authority, will take place at the Contractor's facility and will be scheduled by the Contracting Authority as and when required. DND's attendees at these meetings, as a minimum, will be the Requisitioning Authority and Technical Authority.

19.2 The Contractor will prepare a draft copy of the minutes for Contract Authority review and within fifteen (15) calendar days distribute written minutes of the Progress Meetings which shall constitute the official record of the progress of the Work. Signature blocks will be provided on the minutes for the Contracting Authority, Requisitioning Authority, Technical Authority and the Contractor which will be signed at the subsequent progress meeting or sooner by electronic means.

20. Accommodation and Travel

20.1 Contractor personnel may be required to travel to NDHQ, other DND establishments, other Contractor's plants or other locations within Canada or internationally, as may be designated by the Technical Authority. All travel will require prior written approval of the Requisition Authority. At such time the contractor personnel may be provided where practical, service transportation and, in a cost reimbursement basis, accommodation and messing equivalent to that of an officer in the Canadian Armed Forces. Travel shall be in accordance with Treasury Board Travel Policy. Any contractor representative shall be prepared to travel and work on one of HMC Ships, when requested by the Technical Authority or delegated representative. Contractor representative shall accept DND rations and accommodation provided on board. Representative will normally proceed to the embarkation point by commercial transportation. The cost of commercial transportation and accommodation is reimbursable at cost against this activity in accordance with Treasury Board Travel Policy with no allowance for overhead or profit.

- 20.2 Employees of the Contractor, when undertaking the performance of their services at an establishment of the Department of National Defence will be accorded officer status.

21. SACC Manual Clauses

A1009C 2008-05-12 Work Site Access

B8041C 2008-05-12 Catalogue of Material on CD-ROM

B8044C 2007-05-25 Mobile Repair Parties

C2801C 2011-05-16 Priority Rating - Canadian-based Contractors

D2025C 2008-12-12 Wood Packaging Materials

*22. *N0001C Limitation of Contractor's Liability for Damages to Canada* 2008-05-12

22.1 *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.*

22.2 *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 \$ CONTRACT VALUE. This limitation of the Contractor's liability does not apply to:*

a.any infringement of intellectual property rights; or

b.any breach of warranty obligations.

22.3 *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.**

Solicitation No. - N° de l'invitation

W8482-116492/A

Amd. No. - N° de la modif.

011

Buyer ID - Id de l'acheteur

002ml

Client Ref. No. - N° de réf. du client

W8482-116492

File No. - N° du dossier

002mlW8482-116492

CCC No./N° CCC - FMS No/ N° VME

ANNEX(E) E, page 1 of 2
Price Grid Sheet - Feuille de cotation

(Firm Hourly Rates & Firm Prices, as applicable – Prix ferme et taux horaire pour tous les NNO, si applicable)

GROUP - GROUPE # 1, 2, 3 & 4

| DESCRIPTION | |
|---|--|
| Firm price for application of ceramic coating (if applicable) – Prix ferme pour l'application d'une couche de céramique (si applicable) | |

| DESCRIPTION | |
|--|--|
| Firm Houly Labour Rate for Modifications, MRPs & In plant reduction to spares - - Taux horaire ferme pour les réparations, modifications, équipes mobiles de réparation & réduction en pièces détachées. | |

| DESCRIPTION | |
|---|--------------|
| Firm Markup for Parts & Materiel to carry out modifications and MRPs - - Majoration ferme pour les pièces et le matériel pour les modifications et les équipes mobiles de réparation. | Fixed at 15% |

| DESCRIPTION | |
|--|--|
| Firm Composite Hourly Labour rate for TSOW 3.35, 3.2.6, 3.2.7 & 3.2.8 activities for all groups of pumps - - Taux horaire composé pour les tâches CDCT 3.2.5, 3.2.6, 3.2.7 & 3.2.8 pour tous les groupes de pompes | |

| DESCRIPTION | |
|---|---|
| Firm Fixed Price to conduct additional noise and vibration readings for HALIFAX Class equipment - - Prix ferme pour effectuer les mesures additionnelles du bruit et de la vibration pour les équipements de la Classe HALIFAX. | Include in Firm Fixed Price for Major Overhaul, as applicable |

Solicitation No. - N° de l'invitation

W8482-116492/A

Client Ref. No. - N° de réf. du client

W8482-116492

Amd. No. - N° de la modif.

011

File No. - N° du dossier

002mlW8482-116492

Buyer ID - Id de l'acheteur

002ml

CCC No./N° CCC - FMS No/ N° VME

ANNEX(E) E, page 2 of 2
Price Grid Sheet - Feuille de cotation

(Indicate Group # and complete for each NSN per group – Indiquer le Groupe et compléter pour chaque NNO)

GROUP - GROUPE # _____

| DESCRIPTION | NSN | PIÈCE-PART # |
|---|-----|--------------|
| | | |
| Firm Price for Basic Overhaul - Prix ferme pour réparation & révision de base With impeller- avec roue ____ Without impeller- sans roue ____ Firm price for add-ons/Prix ferme pour ajouts ____ Firm Price for Major Overhaul - ____ Prix ferme pour réparation & révision générale | | |

| DESCRIPTION | NSN | PIÈCE-PART # |
|---|-----|--------------|
| | | |
| Firm Price for Basic Overhaul - Prix ferme pour réparation & révision de base With impeller - avec roue ____ Without impeller - sans roue ____ Firm price for add-ons/Prix ferme pour ajouts ____ Firm Price for Major Overhaul - ____ Prix ferme pour réparation & révision générale | | |

| DESCRIPTION | NSN | PIÈCE-PART # |
|---|-----|--------------|
| | | |
| Firm Price for Basic Overhaul - Prix ferme pour réparation & révision de base With impeller - avec roue ____ Without impeller - sans roue ____ Firm price for add-ons/Prix ferme pour ajouts ____ Firm Price for Major Overhaul - ____ Prix ferme pour réparation & révision générale | | |

ANNEX E-1

FIRM FIXED PRICES FOR REPAIR OF RE-USABLE COMPONENTS

Each repair requires the prior written approval of DND.

| Re-Usable Component | Firm Fixed Price for Repair |
|----------------------------|--|
|----------------------------|--|

From TSOW 3.3.8:

| | |
|--|--|
| 3.3.8.1 Main pump shaft | |
| 3.3.8.2 Main pump casing | |
| 3.3.8.3 Pump/motor mounting bracket | |
| 3.3.8.4 Pump rotor/housing (where fitted) | |
| 3.3.8.7 Shaft sleeve (where fitted) | |
| 3.3.8.9 Impeller (s) and impeller wear ring(s) (where fitted) | |

From TSOW 3.3.9.1 to 3.3.9.3:

| | |
|----------------------------------|--|
| 3.3.9.1 Motor shaft and armature | |
| 3.3.9.2 Stator windings | |
| 3.3.9.3 Motor housing | |

From TSOW 3.3.10.1 to 3.3.10.4:

| | |
|---|--|
| 3.3.10.1 main turbine casing | |
| 3.3.10.2 turbine rotating assembly | |
| 3.3.10.3 turbine/gearbox/pump mounting brackets | |
| 3.3.10.4 gearbox assembly | |

ANNEX F
RATED EVALUATION CRITERIA and APPLICABLE RATINGS
 (one bid rating per group of items)

A. Mandatory Criteria:

| Criterion | Met | Not met | Comments |
|---|---------|---------|----------|
| <u>Warranty:</u> Warranty period shall be a combination of: - 1 year after installation - After shipment & acceptance at DND Depot, maximum storage period of 1 year prior to installation | | | |
| <u>Turn Around Time (TAT):</u> The maximum TAT shall be 120 days. | | | |
| <u>Quality Assurance:</u> Bidder is currently certified to ISO 9001:2008 or has a comparable and acceptable Quality Management System in place. | | | |
| <u>Repair & Overhaul (R&O) Experience:</u> Bidder must have a minimum of 5 years experience in the last 10 years in performing Repair & Overhaul work on various types of pumps. | | | |
| <u>Technical Data and R&O Specifications:</u> Bidders shall clearly demonstrate the technical data and R&O specifications required to undertake and successfully complete all aspects of the R&O services; i) The bidder is the Original Equipment Manufacturer (OEM) ii) The bidder has a license or agreement with the relevant OEM (bidders shall provide a copy of the license or agreement with the relevant OEM prior to closing of bid submission period). | Group 1 | | |
| | Group 2 | | |
| | Group 3 | | |
| | Group 4 | | |

| | | | |
|---|--|--|--|
| <u>Mobile Repair Parties:</u> Bidder shall demonstrate their capability of providing Mobile Repair Parties support on an as and when required basis. | | | |
| <u>Engineer - education/experience:</u> Bidder must have a minimum of one (1) engineer with a degree in mechanical engineering and have at least 5 years of experience in the last 10 years in a pump related field. | | | |
| <u>Technologist – certification/experience</u> Bidder must have a minimum of one (1) technologist with a mechanical technical certification and having at least 3 years of experience in the last 10 years in a pump related field. | | | |

B. Point rated criteria:

| Criterion | Rating | Maximum Points |
|---|--|----------------|
| General (14 points) | | |
| Warranty Longer than the mandatory 1 year storage period after shipment and receipt at DND facility following completion of R&O; or Longer than the mandatory 1 year warranty period after installation; or Combination of additional year(s) of storage period in DND's facilities and warranty period after installation. | (maximum: 70) 15: for additional year of warranty beyond minimum (1 year warranty), after installation (per group of pumps, max 4 years additional). 5: for each additional year of storage beyond the 1 year minimum after completion of R&O, to a maximum of 5 years or 25 points(per group of pumps). | 7 |
| Administrative (contracting) experience Number of large commercial, Other Government Department or DND contracts performed by bidder in the past 10 years; *any contract, Pump R&O related or not* | (maximum: 10) 1: for each contract currently held and valued at \$100,000 or more. Ten (10) contracts maximum. | 7 |

| | | |
|---|---|----|
| Technical (32 points) | | |
| Years of experience in R&O | (maximum: 10) | 5 |
| Bidder has more than the minimum 5 years experience performing R&O. | 1: for each year of experience above the minimum of 5 years of experience, maximum 10 years beyond mandatory 5 years. | |
| R&O contracts in Pump field | (maximum: 10) | 5 |
| Number of large commercial, Other Government Department or DND R&O contracts completed in the past 5 years by the bidder. | 1: for each commercial, OGD or DND R&O contract completed in the past 5 years and valued at \$100,000 or more. 10 contracts maximum. | |
| Types of Pumps Overhauled | (maximum: 22) | 22 |
| Number of similar pumps overhauled (within 25% capacity of HeadFlow and/or Horsepower rating) per NSN successfully completed major overhaul by bidder within the last 5 years. List client, date completed and brand/model number for each NSN. | 10: For each NSN number with direct experience: Group 1 Maximum Rating: 260 Group 2 Maximum Rating: 220 Group 1 Maximum Rating: 110 Group 2 Maximum Rating: 120 | |
| Engineering (4 points) | | |
| Engineer - education/experience | (maximum rating: 25) | 2 |
| Bidder must have a minimum of one (1) engineer with a university degree in mechanical engineering and having at least 5 years of experience in a pump related field | 3: for each additional mechanical engineer with a minimum of 5 years of relevant experience 5: for each of the above engineer with higher engineering degrees (masters,doctorates), if relevant to pumps | |
| Technologist - certification/experience | (maximum rating: 10) | 2 |
| Bidder must have a minimum of one (1) technologist with a technical certification and having at least 3 years of experience in a pump related field | 2: for each additional technologist with a technical certification and having at least 3 years of experience in a pump related field | |
| TOTAL | 157 | 50 |

Instructions:

A team of DND and PWGSC evaluators will determine compliance with mandatory requirements and assign ratings to the Bidders for each of the above rated criteria on a consensus basis.

Section A: Mandatory Criteria:
Warranty:

Bidder must state in writing their compliance to the minimum mandatory warranty and if applicable (reference section B of Point rated criteria, section B), indicate additional warranty period provided after installation and/or the additional storage period provided. Any additional warranty period indicated from the stated mandatory period, will become the duration of warranty in the resulting contract.

Bidders and their subcontractors or partners shall each state their conformance with the relevant requested Turnaround Time to overhaul pumps and motors as applicable.

Turnaround Time (TAT):

Bidders shall demonstrate that they or their major subcontractors or partners are capable of meeting the mandatory maximum turnaround time (TAT) of 120 days, or a lesser proposed TAT, by providing in their bid a flow diagram or a detailed process description indicating activities which will be undertaken and the time taken by each activity to complete them. Failure to provide this flow diagram or detailed process will result in the bid being declared non-responsive. When requested by the contractor, delivery of DND spares shall not be recognized as a cause for excusable delay.

Quality Assurance:

Bidders shall provide in their bid their Quality Assurance Plan and Procedures for assessment by DQA and if the bidder is certified ISO 9001:2008, shall provide a copy of their certificate. They must submit for acceptance by the Department of National Defence (DND) a Quality Plan prepared according to the latest issue (at closing date) of ISO *10005* "Quality management - Guidelines for quality plans". The Quality Plan shall 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 Quality Plan.

The documents referenced in the Quality Plan shall be made available when requested by the Department of Public Works and Government Services or DND.

Repair & Overhaul (R&O) Experience:

For a minimum of 5 years during the past 10 years, bidders shall fully demonstrate their experience and expertise in performing the repair and overhaul services for similar type of pumps as listed in each Group and within 25% capacity of each stated NSN number of this solicitation.

More particularly, they shall provide; A list of some contracts they have completed, indicating customer, pump brand and model number, value of contract, turnaround time achieved, warranty offered and acceptance standards required by the customer.

Sources of Technical Data and R&O Specifications:

Per the Group List of OEM below, bidders must either;

1. Clearly indicate that they are the Original Equipment Manufacturer (OEM) and holder of all rights to the "Technical Data Package"(TDP) and R&O for the indicated brands; or
2. Bidders shall demonstrate the arrangements made for the provision of R&O specifications

and TDP's from the Original Equipment Manufacturer (OEM) by providing letters of intent from each OEM in the list below, identifying them as an authorized partner for this solicitation and giving them access to the OEM's TDP and R&O packages, at time of closing.

List of OEM per Group:

Group 1: Weir & Peacocks
 Group 2: IMO, Warren
 Group 3: Leistritz, Carter, Wilden, FMC
 Group 4: Ingersoll-Dresser/Curtis-Wright

Mobile Repair Parties:

Bidder shall demonstrate their capability of providing Mobile Repair Parties support on an as and when required basis, with ability to travel worldwide on 72hrs notice.

Engineer – education/experience:

Bidder will provide in their bid the relevant documentation to confirm their employee, subcontractor or partner is qualified (diploma and resume) as required and that this level of engineering support will be provided for the entire duration of the contract (if applicable).

Technologist – certification/experience:

Bidder will provide in their bid the relevant documentation to confirm their employee has a mechanical technical certification as indicated and that this level of technical support will be provided for the entire duration of the contract (if applicable).

Facilities and Test installations:

The services of Naval Engineering Test Establishment (NETE) may be used by contractors but will not be provided separately and free of charge or on a priority basis by Canada for this requirement. Bidders that have elected to use NETE as the test facility for any of the pumps of this requirement shall request the NETE Quote document issued by the Commanding Officer of NETE from the Contracting Authority. Bidders proposing NETE as a test facility shall provide separately from Annex D, for each pump tested at NETE, the details (including NETE quotes) of the testing costs included in their firm prices for verification by the Contracting Authority. For each of the pumps tested at NETE, the Contractor shall submit a copy of the NETE testing invoice with its invoice for the completed work.

With the exception of testing facilities addressed above, Bidders must demonstrate that they or their major subcontractors or partners have adequate facilities to perform the Work. Bidders must identify and describe the facilities and instrumentation to be used in the course of the contract and which will meet the requirements of the Technical and Logistic Statements of Work. Bidders or their major subcontractors or partners shall have or shall make provision to have the use of testing installations and equipment for electric motors and pumps, as well as steam turbine driven pumps, to suitably confirm performance and vibration output of overhaul pumps and motors in accordance with relevant specifications in this bid solicitation._

In responding to this solicitation, bidders shall include in their bid a description of the vibration monitoring equipment, test loops, mounting arrangements, parameters to be measured, accuracy of instrumentation and provisions for calibration. In addition, bidders shall include in their bid the plan they will follow for performance and vibration testing of the overhauled pumps and motors. Bidders or their major subcontractors or partners shall have an installation capable of secure mounting of pumps of approximate weight of 1200 kg, with resilient mounts and flexible connections in accordance with the Statements of

Work. Bidders or their major subcontractors or partners shall have a test loop with minimum pipe sizes and capable to withstand peak pressure and flow rate expected of any of the equipment items identified."

Major Subcontractors:

If repair and overhaul work of a complete item or any major component repair and overhaul work, testing or any part of testing is to be subcontracted, bidders shall identify in their bid all subcontractors who will work on the contract and fully describe the capabilities of the companies to which they will subcontract, in the form of a short history of the subcontractors and a list of some of the contracts the subcontractors have completed, indicating customer, type of testing done, turnaround time achieved, and standard of accuracy required by the customer. Bidders shall describe the equipment which the subcontractors will use and the plan the subcontractors will follow for QA, performance and vibration testing of the overhauled pumps and motors. **If, based on requirements described in this bid solicitation, a subcontractor proposed in the bid is found non-responsive to the mandatory requirements of this bid solicitation, the bid shall be declared non-responsive.**

Section B: Point Rated Criteria:

- A. Each Rating Score obtained is divided by the maximum stated rating and this result is then multiplied by the Maximum points allowed to obtain a score per Point rated criteria.
- B. Per Group of pumps, bidders are required to achieve a minimum score of thirty (30) points (sum of scores for each point rated criteria) from a total possible point score of fifty (50) points, in order to be considered for award.

Example: Under "Warranty Rating", you stipulate an additional storage period after receipt of 2 extra years, 2 X 5 Rating points will provide the following points:

1. 2 X 5 Rating Score = 10
2. 10 divided 80 (Possible Total Rating of 80) = 0.125
3. 0.125 X 7 (possible points) = 0.875 points
4. The sum of each criteria is totalled to provide Point Score.

TECHNICAL STATEMENT OF WORK FOR THE REPAIR AND OVERHAUL OF MISCELLANEOUS MARINE PUMPS

1 SCOPE

1.1 Definition

This Technical Statement of Work (TSOW) defines the requirements and scope of work necessary to accomplish the repair and/or overhaul (R&O) and support of a variety of pump assemblies or subassemblies used in various fluid systems aboard Department of National Defence (DND) ships.

1.2 Background

The Department of National Defence has a requirement to repair/overhaul and test various pumps, their prime movers and their components, on an as requested basis. Also included in this requirement, on an as requested basis, are performing modification, conducting Special Investigations and Technical Studies (SITS), supplying Field Service Representatives / Mobile Repair Parties (FSR/MRP) and providing Technical Investigation and Engineering Support (TIES) for the stated equipment and their applicable systems. The equipment, listed in four groups in Appendices 4 to 7 in this TSOW, are predominantly pumps used in fresh & salt water and fuel & lube oil systems, but also includes some pumps from pollution abatement and other systems.

1.3 Terminology

1.3.1 Acronyms applicable to Annex A:

SOW - Statement of Work
R&O - Repair and Overhaul
DND - Department of National Defence
SITS - Special Investigations and Technical Studies
FSR - Field Service Representatives
MRP - Mobile Repair Parties
TIES - Technical Investigation and Engineering Support
OEM - Original Equipment Manufacturer
VA - Vibration Analysis

1.3.2 Definitions applicable to Annex A

Major Overhaul: the Work to overhaul the equipment to 'as good as new' condition and performance. The Work includes: all labour and material required to perform pump repairs and overhauls including receipt, disassembly, visual, dimensional and non destructive inspections, mandatory part replacements, missing components replacement, cleaning,

Annex A

To W8482-11-6492

Dated: 01 March 2011

repair, rebuilding and reconditioning work resulting from inspections, reassembly, fitting, calibrating, testing, painting, preservation, preparation for delivery, packaging and shipping. This applies to all components of the equipment (major and minor). It also includes, when items are delivered to the contractor in reusable containers, the inspection of the container and all minor container repairs (such as: partial repainting, stenciling, patching of holes, recaulking of the seals and weather-stripping).

2 APPLICABLE DOCUMENTS

D-03-002-006/SG-000 - Repair/Overhaul and Post Repair/Overhaul Inspection and Test Procedures for Shipboard Electric Motors dated 2001-07-01 shall apply to the Work.

3 REQUIREMENTS

3.1 General

Contractors shall either possess or be capable of obtaining the R&O Specifications, the Technical Data, and the capabilities necessary to undertake and successfully complete all aspects of the R&O services described in this requirement. The use of subcontractors to perform part or all aspects of the R&O services described in this requirement is acceptable, however, relationship and division of the work must be clearly established.

3.2 Scope of Work

The different types of work to be performed under the resulting contracts are as follows:

- 3.2.1 In plant R&O of pumps units, pump ends, prime movers and their associated components;
- 3.2.2 Conduct and documentation of approved modifications as requested by the Technical Authority;
- 3.2.3 Performance and vibration testing of equipment after overhaul;
- 3.2.4 In plant reduction of equipment to spares;
- 3.2.5 Special investigations and technical services on failed components;
- 3.2.6 Technical investigations and engineering support as required by specific taskings;
- 3.2.7 Mobile repair parties and field service representatives; and
- 3.2.8 Drawings and documentation updates.

3.3 R&O Requirements

Unless specifically advised, the Contractor shall repair, overhaul and test all equipment delivered to his facility to obtain 'as good as new' condition and performance. Repairs and overhauls shall

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be made only to recognized OEM, military and marine standards, specifications, procedures and practices. Only procedures and methods resulting in permanent repairs are acceptable.

3.3.1 General

Complete assemblies or their major subassemblies will generally be supplied to the contractor (e.g. pump/motor assemblies or pump end or motor) for overhaul and performance testing. They will also be generally supplied without any shock mounts. Components or subassemblies of the pumps or their drives may also be supplied to the Contractor for repair on an as requested basis. The Contractor may receive equipment packed into shipping crate without any flexible mounts.

3.3.1.1 For the following Ingersoll Dresser Pumps, complete assemblies will generally be supplied to the contractor (e.g. pump-motor assemblies). These assemblies are defined by the "Standard Disconnect Point Specifications" that follows:

| NSN | DESCRIPTION | SPECIFICATION |
|------------------|--|---------------------|
| 4320-21-904-1983 | Main fire pump | C-27-876-000/TD/001 |
| 4320-21-907-5967 | Diesel driven fire pump. (Pump end only) | C-27-877-000/TD-001 |
| 4320-21-904-1985 | Auxiliary sea water circulating pump | C-27-880-000/TD-001 |
| 4320-21-904-1989 | Jockey fire pump | C-27-931-000/TD-001 |
| 4320-21-904-1976 | Fresh hot water circulating pump | C-27-878-000/TD-001 |
| 4320-21-904-1965 | Fresh water service pump (complete with priming pump) | C-27-879-000/TD-001 |

The Technical Authority shall be informed before work is started on assemblies which do not conform to these Standard Disconnect Point Specifications should any be received. After overhaul, assemblies shall be returned to DND in conformance with the applicable Standard Disconnect Point Specification.

3.3.2 For each individual piece of equipment delivered to their facility for overhaul, the Contractors shall be responsible for all aspects of a major overhaul from receipt, to overhauling and testing, to return of the equipment.

3.3.3 The Contractor must supply and utilize only genuine OEM parts in all repairs.

3.3.4 Clearances/tolerances shall be returned to original "as new" condition

3.3.5 The Contractor shall overhaul all equipment to achieve the performance and vibration requirements outlined on the Equipment Performance Sheets in Appendices 4 through 7 in Annex A.

3.3.6 As part of the major overhaul for individual equipment, the Contractor shall install/replace any missing or damaged Vibration Analysis (VA) blocks prior to performance

testing. The required number and location of VA blocks are shown on the Equipment Performance Sheets in Appendices 4 through 7 in Annex A. The Contractor shall follow the installation procedure provided at Appendix 2 of Annex A.

3.3.7 Assemblies or subassemblies, which are missing components and do not conform to the "Equipment Configuration Checklist" outlined on each Equipment Performance Sheet of Appendices 4 through 7 in Annex A, are to be identified prior to commencement of work. The identified "missing components" are to be exclusive of the VA blocks and of any parts requested to be replaced in the major overhaul. The Contractor shall supply all missing components if replacement parts are not available from DND. All equipments returned to DND after overhaul shall be in conformance with the applicable "Equipment Configuration Checklist" outlined on each Equipment Performance Sheet in Appendices 4 through 7 in Annex A.

3.3.8 Pump Overhaul:

Pumps shall be inspected, repaired and overhauled, and tested. Impeller type pumps shall be balanced. Items 5, 6, 8 and 9 of the following components are to be replaced during basic overhaul under normal conditions. Item 9 may be re-used only if in exceptional condition and requires the advanced approval of DND (even then the wear rings must be replaced). The remainder shall be assessed and replaced as required. Required replacement of either 3.3.8.1, 3.3.8.2, 3.3.8.3 and/or 3.3.8.7, shall constitute add-ons to the basic overhaul requiring the advanced approval of DND. Serial numbers for all replacement parts installed shall be tracked and provided to DND upon request.

- 3.3.8.1 Main pump shaft;
- 3.3.8.2 Main pump casing;
- 3.3.8.3 Pump/motor mounting bracket;
- 3.3.8.4 Pump rotors/housing (where fitted);
- 3.3.8.5 Mechanical seal cartridge;
- 3.3.8.6 Steady bearing (where fitted);
- 3.3.8.7 Shaft sleeve (where fitted);
- 3.3.8.8 Casing wear rings (where fitted);
- 3.3.8.9 Impeller(s) and impeller wear ring(s) (where fitted);

3.3.8.9.1 Although the Major Overhaul includes the replacement of the impeller, the Contractor is authorized to re-install a good used impeller at their discretion, as long as the Contractor is in compliance with section 3.3.3. If so, the Contractor shall still continue to assume all risk for both achieving post-overhaul test requirements and for meeting contractual warranty requirements. Also, the Contractor shall provide a credit against the Firm Fixed Price for the

Annex A

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Major Overhaul of the pump of 50% of the current market value of a new impeller.

3.3.8.10 All sealing soft goods, i.e. gaskets, seals, 'o' rings, packing etc.;

3.3.8.11 All securing fasteners e.g. nuts, cap screws, flat and lock washers, etc. (studs shall be removed from castings unless damaged); and

3.3.8.12 The contractor shall replace the packing seals with mechanical seals on all Coffin Feed Pumps (4320-21-867-1152).

3.3.8.13 The preferred method of metal replacement/build-up is by either an approved High Velocity Oxy Fuel (HVOF) arc spray coating or preferably a High Pressure/High Velocity Oxy Fuel (HP/HVOF) arc spray coating. Though other methods of repair are acceptable, they must be a recognized procedure as previously stated; otherwise, approval must be obtained from the Technical Authority. Critical repaired areas shall be restored to "as good as new" condition and shall not suffer any performance or capability degradation/restrictions.

3.3.8.14 The contractor shall be paid a firm price per pump to apply a ceramic coating for the first time to a pump or to replace excessively corroded coatings thereafter. Any repair of coating (touch up) shall be reimbursed to the contractor on a time and material basis in accordance with the Off Ramp rates applicable up to a maximum of the cost of a new coating.

The contractor shall use a 3 phase ceramic coating:

Belzona product:

- 1) 9111 Supermetal
- 2) 1341 Supermetal Glide Blue
- 3) 1341 Supermetal Glide Grey

Use of any other equivalent substitute ceramic product must be beforehand approved by the Technical Authority in writing.

The contractor shall apply a ceramic coating to the following pumps:

Motor Driven Fire Pumps (4320-21-904-1983)

Motor Driven Jockey Fire Pumps (4320-21-904-1989)

Auxiliary Sea Water Circulating Pumps (4320-21-904-1985)

Diesel Driven Fire Pumps (4320-21-907-5967)

3.3.9 Electric Motor Overhaul

Motors shall be dimensionally inspected, overhauled and tested as specified in D-03-002-006/SG-000. Motor bearings shall always be replaced. Components to be inspected, tested, and overhauled as necessary include:

3.3.9.1 Motor shaft and armature;

3.3.9.2 Stator windings; and

3.3.9.3 Motor Housing.

3.3.10 Steam Turbine Overhaul

Steam turbines shall be inspected, overhauled, balanced and tested. Normally, the following components shall be inspected and replaced as necessary replaced as part of the major overhaul price:

3.3.10.1 main turbine casing;

3.3.10.2 turbine rotating assembly;

3.3.10.3 turbine/gearbox/pump mounting brackets;

3.3.10.4 gearbox assembly;

3.3.10.5 steam and oil labyrinths;

3.3.10.6 journal and thrust bearings (where fitted);

3.3.10.7 shaft sleeves (where fitted);

3.3.10.8 all sealing soft goods i.e.gaskets, seals and packing, etc; and

3.3.10.9 all securing fasteners e.g.. nuts, studs, cap screws, flat and lock washers, etc.

3.3.11 Component Repair

All components shall be repaired to OEM “as new” tolerances and condition. Repairs shall be made only to recognized OEM, military and marine standards, specifications, procedures and practices. Only procedures and methods resulting in permanent repairs are acceptable.

3.3.12 Testing of Equipment

The Contractor shall test and record the performance and vibration levels of each pump unit, pump, electric motor or steam turbine on a suitable test loop. Performance points, performance test parameters and maximum acceptable vibration levels are provided in the Equipment Performance Sheets of Appendices 4 through 7 in Annex A. The pumps are to be tested at their rated speeds.

3.3.13

Performance point readings shall be taken as close as possible to the operating point specified. Special test parameters specified for individual equipment as specified in the Equipment Performance Sheets of Appendices 4 through 7 in Annex A shall be achieved.

Annex A

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All specifications listed in the Appendices are the latest versions (ammended by waiver or specification change).

3.3.14

Vibration readings shall be taken at various octave bands as required by Appendix 1 of Annex A. Except for stand alone electric motors, these tests and readings are in addition to those required by D-03-002-006/SG-000.

3.3.15

In addition to the vibration readings required in para. 3.3.14, noise and vibration readings shall be taken on designated HALIFAX Class equipment in accordance to the test procedures and specifications provided in Appendix 3 of Annex A. Equipment requiring these additional test are identified in their respective Equipment Performance Sheets provided in Appendices 4 through 7 in Annex A. The maximum noise and vibration limits that must be achieved on complete pump units are provided in attachments to Appendix 3 of Annex A.

3.3.16

The Contractor shall allow the Technical Authority or its representatives access to witness equipment testing.

3.3.17 Acceptance Criteria of Overhauled Equipment

Performance points, performance test parameters and maximum acceptable vibration levels are provided in Equipment Performance Sheets of Appendices 4 through 7 in Annex A.

3.3.18

The performance of the overhauled equipment shall be within +5% to -3% of the performance point specified for the particular equipment.

3.3.19

All vibration readings in all required directions shall not exceed the levels provided for the particular equipment. Acceptance levels for motors alone shall be as specified in D-03-002-006/SG-000. Maximum levels for stand alone pumps or turbines shall not exceed those provided for the relevant complete pump assembly.

3.3.20

HALIFAX Class equipment identified as requiring airborne noise and vibration testing in their respective Equipment Performance Sheets in Appendices 4 through 7 in Annex A shall not exceed the levels stated in Appendix 3 of Annex A. Data sheets as requested in Appendix 3 of Annex A shall be forwarded to the airborne noise and vibration Technical Authority to determine compliance or noncompliance prior to final acceptance.

3.3.21

Equipment which fails to meet these requirements shall be reworked and retested at the Contractor's expense.

Annex A

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3.3.22 Documentation

For each piece of equipment repaired and overhauled, the Contractor shall produce and retain documentation as required below.

3.3.22.1 The contractor shall produce a "Final Test Report" consisting of the following:

- 3.3.22.1.1 Equipment name, serial number, and NSN;
- 3.3.22.1.2 Initial strip down condition including defects and observations;
- 3.3.22.1.3 Table of performance data versus achieved performance;
- 3.3.22.1.4 Test documentation requested in section 5.0 of Appendix 1 of Annex A, with VA readings presented in tabular form for each block in two directions as specified at Appendix 1 of Annex B;
- 3.3.22.1.5 Balancing certificate (if applicable);
- 3.3.22.1.6 Closing dimensional inspection;
- 3.3.22.1.7 Description of work done; and
- 3.3.22.1.8 List of all serial numbers of OEM parts used.

One copy is to be enclosed with the equipment, one is to be retained by the Contractor and one is to be forwarded to the Technical Authority.

3.3.22.2 The contractor shall retain the following information:

- 3.3.22.2.1 Receiving information and the initial strip report;
- 3.3.22.2.2 Motor inspection report;
- 3.3.22.2.3 Final test report (para 3.3.22.1 above);
- 3.3.22.2.4 Motor test results in accordance with D-03-002-006/SG-000;
- 3.3.22.2.5 Contractors and subcontractors/suppliers QC documentation; and
- 3.3.22.2.6 Shipping information.

The Technical Authority or his designated representative shall have access to this information on an as required basis.

3.4 MRP/FSR/TIES

3.4.1 MRP

The Contractor shall provide Mobile Repair Parties to travel to a designated ship or base, either nationally or internationally, and conduct repair, overhaul or modification to equipment listed in Annex B. The use of qualified local international mobile repair capability is preferred over extensive travel of the Canadian representative.

3.4.2

The Contractor shall supply and convey all necessary OEM parts to complete the repairs unless otherwise specifically advised in writing by the Technical Authority.

3.4.3

The Contractor must be prepared to respond to urgent requirements. A response time of 48 hours is expected for emergency repairs to the equipment specified herein fitted in vessels located anywhere in the world.

3.4.4 FST/TIES

Specific tasking under the FSR/TIES element of this contract may include, but will not be limited to the following areas:

3.4.4.1 Technical investigation of equipment faults;

3.4.4.2 On-site inspection and related follow-up support (defect correction, modification or supervision of repairs);

3.4.4.3 Provide engineering recommendations and reports on equipment/system improvements and upgrades;

3.4.4.4 Assist in the review of technical documentation and provide recommendations for changes or improvements, including training and maintenance procedures;

3.4.4.5 Make amendments to technical documentation;

3.4.4.6 Provide training for DND personnel on the job or in the Canadian Forces Fleet Schools. Supply of course materials will be charged extra, at cost;

3.4.4.7 Assist in identification of spare parts and the maintenance of configuration control;

3.4.4.8 Inspect components held as spares in the Canadian Forces Supply System; and,

3.4.4.9 Other tasks as submitted by the Technical Authority directly relating to the fitted equipment.

3.4.5 Reports

Pre-Overhaul Inspection reports shall be submitted to the Technical Authority 2 weeks prior to commencing repairs (see template in Appendix 8 of Annex A). Upon completion of repair, reports shall be submitted to the Technical Authority within 2 weeks of completion of each tasking. Report shall consist of the work undertaken, recommendations and conclusions, drawings and any conversations or correspondence related to the task. For simple tasking, report may consist solely of a technical letter.

3.4.6 Security Clearance

Contractor personnel working onboard vessels will be assigned an escort.

3.4.7 Inspection

All services rendered shall be subject to inspection by the Technical Authority or his designated representative. The work and the premises where any work is being performed shall be accessible to the TA during normal working hours.

4 DELIVERABLES

- 4.1 Prior to beginning any repairs, the contractor shall assess the condition of the equipment and provide requested data to the technical Authority. This data must be provided at least 2 weeks before the repair is scheduled to take place. A template of the data requested per pump repair is provided in Appendix 8 of Annex A.
- 4.2 The Contractor shall submit data sheets as requested in Appendix 3 of Annex A for equipment identified as requiring airborne noise and vibration testing after overhaul. These data sheets shall be forwarded to the airborne noise and vibration Technical Authority.
- 4.3 The Contractor shall deliver one hard copy and one soft copy in Microsoft Word of the "final test report", as defined in subsection 3.3.22.1, to the Technical Authority within 3 weeks of completing each equipment overhaul. The Contractor shall deliver one hard copy and one soft copy in Microsoft Word of the report for MRP or FSR or TIES tasking to the Technical Authority within 2 weeks of completion.
- 4.4 The contractor shall deliver quarterly report for all repairs. This report shall include as a minimum the following for each pump: NSN, pump name, job repair number, cost to repair, date received, date shipped back, revised turn around time with justification.

5 TASKING AUTHORITY

All tasks shall be authorized by the Technical Authority, through the Requisitioning Authority. Requests by other DND organizations shall only be accepted with the approval of the Requisitioning Authority.

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To: ANNEX A to W8482-11-6492

Dated: 01 March 2011

HALIFAX CLASS EQUIPMENT
REPAIR AND OVERHAUL NOISE AND VIBRATION TEST PROCEDURES
AND SPECIFICATIONS

OPI: DMSS 2-5-3

DATED: 19 FEB 2001

APPENDIX 3

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Dated: 01 March 2011

HALIFAX CLASS EQUIPMENT R & O NOISE AND VIBRATION TEST PROCEDURES AND SPECIFICATIONS

- 1.1 The Repair and Overhaul Contractor shall conduct airborne noise and vibration tests to demonstrate conformance with requirements defined in Table 1 and Table 2 of this Appendix 3.
- 1.2 The performance sheets for individual items provided in Appendices 4 through 7 of Annex A specify which HALIFAX Class equipment require the additional noise and vibration testing. Airborne noise and vibration measurements shall be carried out on each and every repaired and overhauled piece of equipment identified in Appendix 4 through 7 of Annex A and are to be reported in accordance with Figures 1 to 5.
- 1.3 Test reports shall contain all of the data specified in Figures 1 to 5.
- 1.4 Non compliance with DND requirements renders the machinery not acceptable. Rework must be carried out by the Contractor until DND approves the airborne noise and vibration levels to be acceptable.

2.0 TEST REQUIREMENTS AT THE R&O FACILITY

2.1 General Arrangement

- 2.1.1 The machinery shall be tested in conditions as free from interference of external sources of noise and vibration as possible.
- 2.1.2 All machinery shall be tested while supported on resilient mounts, even if they are to be bolted directly to other machines or structures onboard ship. The vertical natural frequency of the complete mounted assembly is to be less than either one half of the lowest frequency associated with significant disturbing forces, or 7 Hz, whichever is the lower frequency. For machinery which are to be individually resiliently mounted in the ship, mounts of the type specified in para 3.1 of Appendix 1 in Annex A for the ship installation shall be used.
- 2.1.3 All gas, fluid, electrical and mechanical connections to the mounted assembly shall be at least as flexible as those provided in the ship. These should not have a significant influence on the movement of the machine when it is being tested.
- 2.1.4 Air and gas ducts connected to the machine shall be fitted with silencers (mufflers) similar to those used onboard the ship. The ducts themselves shall be lagged to the same extent as on the ship.

2.2 Test Foundation

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2.2.1 The mass of the test foundation and associated brackets shall be at least three times that of the complete supported assembly.

2.2.2 Any pedestals are to be as short and stiff as possible.

2.2.3 Mounts shall be rigidly attached to the test foundation.

2.2.4 The foundation and associated pedestals should, wherever possible, be of reinforced concrete. They shall be free from any resonance that will influence either the machines airborne noise or vibration levels.

2.2.5 Vertical and transverse vibration levels on the foundation shall be a minimum of 10 dB less than the levels obtained on the machine in all octave bands from 31.5 Hz to 8 kHz.

2.3 Machine Operation

2.3.1 Machines shall be tested at all normal operating speeds and loads.

2.3.2 Airborne noise and vibration measurements are to be reported under fully established (steady state) operating conditions. Continuous readings of speed, voltage, current, pressure and temperature are to be taken, as appropriated, to demonstrate that steady state stability is being maintained.

3.0 **REQUIREMENTS FOR DESCRIPTION OF THE TEST ARRANGEMENT**

3.1 The R&O Contractor shall submit at least the following information to the Technical Authority (TA), DMSS 2-5-3, as part of his Test Agenda.

3.1.1 A general layout plan of the test environment; a sketch of the test rig; positions and arrangement of the flexible mounts, and a sketch of all connections to the machine under test.

3.1.2 A list of all instrumentation to be used for measuring noise and vibration, for calibration and for establishing the running conditions. Instrumentation calibration certificates are required to prove calibration is not more than 12 months old.

3.1.3. A sketch showing the positions of all microphones, noting the method of support.

3.1.4 A sketch showing the positions of all accelerometers, noting the method of attachment.

3.1.5 Identification of the procedures that are intended to be used for calibration of measuring equipment and for processing the data.

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3.1.6 Specimens of data sheets that are intended to be use for reporting test data. Suggested formats for reporting of airborne noise and vibration data are given in Figures 1 to 5.

3.2 The R & O Contractor is only required to provide the above testing plan for approval to the TA, DMSS 2-5-3, for the initial pump testing except in the case where he wants to depart from this initial plan whereby he shall resubmit his plan for approval.

4.0 **AIRBORNE NOISE MEASUREMENTS AND PERFORMANCE REQUIREMENTS**

4.1 Requirements

4.1.1 The Contractor is required to demonstrate that the airborne sound pressure levels emitted from the piece of machinery after R&O meet DND requirements.

4.2 Measurement of Sound Pressure Levels

4.2.1 A sound level meter having “A” weighted response to sound pressure, equal to scale “A” of ANSI Standard S1.4 and octave band analysis capability, shall be used to measure the dBA sound pressure levels and octave band levels. The meter shall be of a type approved by DND for this purpose, such as a Bruel & Kjaer 2230 SLM with 1624 Filter Set or a General Radio 1983 Precision Sound Level Meter and Analyzer. Approval to use other suitable meters may be obtained by application to DND. The meter shall be read as the observed arithmetic mean of the digital or analogue readout with the meter in the damped or “slow” condition, RMS mode. If there is a 4 dB or more fluctuation in the readout, this shall be noted and appropriate comments or reasons given.

4.2.2 Four “A” weighted sound pressure level measurements shall be made with the microphone at three positions roughly on a level with the centre of the machine or equipment and maximally spaced (roughly 120° apart) plus one above the approximate centre of the equipment.

4.2.3 An octave band analysis over the frequency range 31.5 Hz to 8 kHz inclusive shall be taken at each of the four positions, identified at 4.2.2, for comparison with the equipment requirements stated in Table 1 of Appendix 3 to Annex A. The sound level meter shall be set to the flat or unweighted mode when recording the octave band measurements. A spectrum based on the maximum octave band level for each band at all measurement locations shall be developed and compared to the acceptance levels specified in Table 1 of Appendix 3 to Annex A. Excess in any octave band is grounds for rejection by the DND. For example, in the 63 Hz octave band, levels of 83, 81, 80 and 80 dB are measured at the four locations. A level of 83 dB in the 63 Hz octave band would be compared to the acceptance level stated in Table 1 of Appendix 3 to Annex A.

4.2.4 Nothing apart from air shall be interposed between the equipment as designed complete

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for shipboard installation (e.g. hoods in place if so fitted) and the microphone. It is the responsibility of the Contractor to provide this environment in the factory test measurements. No subtractions are allowed from the measured levels due to reflection or ambient noise.

4.2.5 Prior to taking the equipment airborne noise measurements, a set of background (ambient) dBA and octave band airborne noise levels shall be taken to establish a baseline without the equipment running. Where in any octave band the background level is within 10 dB of the acceptance level, the Contractor shall identify the source of that "high" background level, and take all reasonable steps to reduce it. Although narrow band analysis of the airborne noise levels is not a contractual requirement, such analysis may be helpful in identifying sources of background interference.

4.2.6 The reference sound pressure for all measurements shall be 20 μ Pa @ 1 metre.

4.3 Operating Conditions

Airborne noise measurements shall be taken with the machine operating in accordance with the conditions stated in Para 2.3.

5.0 **VIBRATION MEASUREMENTS AND PERFORMANCE REQUIREMENTS**

5.1 Requirements

5.1.1 The Contractor is required to carry out measurements that demonstrate that the vibration levels emitted from the R&O piece of machinery meet DND requirements. These requirements are a particular subset of current industry norms and contain no unusual criteria.

5.1.2 Vibration measurements shall be made using piezoelectric accelerometers, whose frequency response is flat to within ± 2 dB from 10 Hz to 10 kHz.

5.1.3 Accelerometers shall be attached to metal blocks that shall be permanently welded or brazed to the machine's structure at the specified locations. These locations are different than the VA block locations used for health monitoring (Appendices 1 and 2 in Annex A). If blocks are not attached when received bidder use procedure as described in Appendix 2: "VA Block Installation Procedure".

5.1.4 The method of accelerometer attachment to the blocks can have a major influence on the frequency response of the accelerometer. For this reason the Contractor is to take all reasonable precautions to minimize the influence of accelerometer attachment resonance. Use of a torque spanner to control accelerometer tightness in accordance with manufacturer's instructions is recommended. Magnetic attachment, plasticine or similar materials shall not be used for other than exploratory purposes, as they cannot ensure accurate measurements at higher frequencies.

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5.2 Location of Accelerometers

- 5.2.1 Accelerometer blocks shall be attached to the machine feet at the four corners above the mount locations to provide measurements in three mutually perpendicular directions.

5.3 Conversion of Acceleration to Velocity Levels

- 5.3.1 DND requirements are specified in VdB reference 10^{-8} m/s. Precise conversion from measured acceleration levels to velocity levels can only be carried out if the exact distribution of vibrational energy with respect to frequency is known. The conventional conversion procedure employed in this specification involves the assumption that all vibrational energy is concentrated at the centre frequency of an octave, in conversion from acceleration to velocity. Inaccuracies of up to 3 dB may be introduced by this process as the actual energy may be concentrated at one end of the octave band. The inaccuracy falls to 1 dB when the conversion is carried out on 1/3 octave band data and to negligible proportions when performed on highly resolved data, as obtained using high resolution FFT analyzers.

5.4 Averaging of Vibration Data

- 5.4.1 Spatial power averages of vibration levels shall be computed using the following formulae:

$$\bar{x} = 10 \log\left(\frac{1}{3}\right) \sum_{i=1}^3 10^{0.1x_{ij}}$$

$$x_j = 10 \log\left(\frac{1}{n}\right) \sum_{i=1}^n 10^{0.1x_{ij}}$$

in which:

x_j = spatial power average in any one direction

\bar{x} = spatial power average for all three directions

n = number of measuring locations

x_{ij} = acceleration (AdB) or velocity (VdB) at j^{th} location

5.5 General Requirement for Reporting of Vibration Data

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- 5.5.1 The Contractor shall report a complete set of vibration data that includes 1/3 and octave band data.

5.6 Reference Acceleration and Velocity Levels

- 5.6.1 One-third and octave band data shall be reported in tabular form. Acceleration and velocity levels shall be quoted in AdB ref 10^{-5} m/s^2 and VdB ref 10^{-8} m/s , respectively.

5.7 Reporting of 1/3 Octave and Octave Band Data

- 5.7.1 The following data are to be reported:

- 5.7.1.a Measured above mount acceleration levels for each ISO 1/3 octave band in the frequency range 10 Hz to 10 kHz,
- 5.7.1.b calculated 1/3 octave spatial power averages of the measured accelerations for each of three directions of measurement and over all three directions,
- 5.7.1.c calculated 1/3 octave spatial power average velocity levels for each of the three directions of measurements, and over all three directions,
- 5.7.1.d calculated octave band spatial power average velocity levels for each of the three directions of measurements, and over all three directions.

- 5.7.2 Octave band velocity levels may be obtained by power summation of the corresponding 1/3 octave data.

- 5.7.3 1/3 and octave levels are to be reported on the standard data sheets attached as Figure 4 of this specification.

5.8 Background Vibration Levels

- 5.8.1 Background acceleration levels in ISO octave bands from 31.5 Hz to 8 kHz inclusive shall be measured before and after each test run, and reported to demonstrate the extent to which apparent machine vibration may have been influenced by extraneous sources. When a machine under test has to be supplied with fluids under pressure using auxiliary units, the Contractor shall establish the influence of these auxiliary units on the measured vibration of the test machine.

5.9 Calibration

- 5.9.1 Calibration shall be carried out before and after vibration measurement, by removing each accelerometer in turn from its mounting block and applying a known acceleration to it via a calibrator. The calibrator output shall be clearly identified and stated. The output signal from the signal conditioning and analysis instrumentation shall be checked against

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the accelerometer sensitivity stated by the manufacturer. The Contractor shall provide full details of date and place of calibration with his test report (see Figure 1).

6.0 **COMPARISON WITH DND REQUIREMENTS**

6.1 **Acceptance**

- 6.1.1 A machine will be accepted in respect to its noise and vibration performance when compliance with DND's Airborne noise and Vibration requirements (see Table 1 & 2 of Appendix 3) have been demonstrated. All airborne noise and vibration data is to be provided to DMSS 2-5-3 for analysis to determine equipment compliance/non-compliance.

6.2 **Rejection**

- 6.2.1 Any excess of the acceptance levels in any octave band shall be an adequate reason for rejection by DND.

7.0 **DATA SHEETS FOR AIRBORNE NOISE AND VIBRATION TESTS**

- 7.1 Standard data sheets are included in this specification as:

Figure 1 Airborne Noise and Vibration Instrumentation Data

Figure 2 Airborne Noise Sound Pressure Level Test Data

Figure 3 Octave Band Vibration Test Data

Note: For Halifax-class pumps only

Figure 4 One Third Octave Band Vibration Data

Figure 5 Sketch of Machinery Test Installation

Table 1 Machinery R&O Noise Requirements

Table 2 Machinery R&O Power Average Vibration Requirements

Note: This table is not exhaustive of the Halifax-class pumps covered by this RFP. The performance criteria for any pumps missing from this table can be found in Appendix 4, 5, 6 or 7 to Annex A depending on the group.

8.0 **ENQUIRIES**

- 8.1 All enquiries concerning this specification should be submitted to DND attention DGMEPM/DMSS 2-5-3.

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AIRBORNE NOISE AND VIBRATION INSTRUMENTATION DATA SHEET

| INSTRUMENTATION USED IN TESTS | | | | | |
|------------------------------------|--------------|------|-------------|-------|-------|
| ITEM | MANUFACTURER | TYPE | CALIBRATION | | NOTES |
| | | | DATE | PLACE | |
| AIRBORNE NOISE | | | | | |
| MICROPHONE | | | | | |
| PRE-AMP | | | | | |
| CALIBRATION DEVICE | | | | | |
| SOUND LEVEL METER | | | | | |
| VIBRATION | | | | | |
| ACCELEROMETER | | | | | |
| ATTACHMENT | | | | | |
| PRE-AMP | | | | | |
| AMP | | | | | |
| CALIBRATOR | | | | | |
| SIGNAL PROCESSING EQUIPMENT | | | | | |
| 1/3 OCTAVE ANALYSER | | | | | |
| OCTAVE ANALYSER | | | | | |

FIGURE 1

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AIRBORNE NOISE SOUND PRESSURE LEVEL TEST DATA

| STATE | MICROPHONE POSITION | AIRBORNE SOUND PRESSURE LEVELS dB REF 20µPa @ 1 metre | | | | | | | | | |
|------------------------|---------------------|---|----|-----|-----|-----|----|----|----|----|-------------|
| | | OCTAVE BAND CENTRE FREQUENCY IN HZ | | | | | | | | | dB(A) TOTAL |
| | | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| BACKGROUND BEFORE TEST | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | MAX | | | | | | | | | | |
| | | | | | | | | | | | |
| MACHINE RUNNING | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | MAX | | | | | | | | | | |
| | | | | | | | | | | | |
| BACKGROUND AFTER TEST | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | MAX | | | | | | | | | | |

Show positions of all microphones on Sketch - Figure 5

N.B.

- (i) Test results will not be acceptable if the Background Levels are within 10 dB in any octave band when the machine is running.
- (ii) Complete a new sheet for each running state if this machine has more than one normal operating state.

FIGURE 2

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MEASURED OCTAVE BAND VIBRATION TEST DATA

| DIRECTION OF MEASUREMENT | LOCATION OF ACCELEROMETERS | MEASURED ACCELERATION LEVELS AdB REF 10^{-5}m/s^2 | | | | | | | | |
|--|----------------------------|---|----|-----|-----|-----|-----|-----|-----|-----|
| | | OCTAVE BAND CENTRE FREQUENCY IN HZ | | | | | | | | |
| | | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| VERTICAL | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | POWER AVERAGE | | | | | | | | | |
| F/A AXIAL ON HORIZONTAL MACHINE | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | POWER AVERAGE | | | | | | | | | |
| TRANSVERSE | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | POWER AVERAGE | | | | | | | | | |
| TRI-AXIAL | O/A POWER AVERAGE | | | | | | | | | |
| | | EQUIVALENT AVERAGE VELOCITY LEVELS VdB REF 10^{-8}m/s | | | | | | | | |
| | CONVERSION AdB to VdB | +14 | +8 | +2 | -4 | -10 | -16 | -22 | -28 | -34 |
| VERTICAL | POWER AVERAGES | | | | | | | | | |
| F/A | | | | | | | | | | |
| TRANSVERSE | | | | | | | | | | |
| TRI-AXIAL | | | | | | | | | | |

N.B. (i) All vibration measurements must be 10 dB above Background Levels in all octave bands.

(ii) Complete a new sheet for each running state if this machine has more than one operating state, and for each set of background measurements.

FIGURE 3

1/3 OCTAVE BAND VIBRATION DATA

| DIRECTION OF MEASUREMENT | | LOCATION OF ACCELEROMETER | MEASURED ACCELERATION LEVELS AdB REF 10 ⁻⁵ m/s ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|--|---------------------------|--|------|----|----|----|------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|------|-----|------|-------|-----|-----|------|-----|-----|--|
| | | | 1/3 OCTAVE BAND CENTRE FREQUENCY IN HZ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 10 | 12.5 | 16 | 20 | 25 | 31.5 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 | 500 | 630 | 800 | 1k | 1.25k | 1.6k | 2k | 2.5k | 3.15k | 4k | 5k | 6.3k | 8k | 10k | |
| VERTICAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | POWER AVERAGE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F/A (AXIAL ON HORIZONTAL MACHINE) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | POWER AVERAGE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TRANSVERSE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | POWER AVERAGE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | POWER AVERAGE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CONVERSION AdB to VdB | EQUIVALENT AVERAGE VELOCITY LEVELS VdB REF 10 ⁻⁸ m/s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 24 | 22 | 20 | 18 | 16 | 14 | 12 | 10 | 8 | 6 | 4 | 2 | 0 | -2 | -4 | -6 | -8 | -10 | -12 | -14 | -16 | -18 | -20 | -22 | -24 | -26 | -28 | -30 | -32 | -34 | -36 | |
| VERTICAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TRANSVERSE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TRI-AXIAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

FIGURE 4

N.B. (i) All vibration measurements must be 10 dB above the background levels in all octave bands.
(ii) Complete a new sheet for each running state if this machine has more than one operating condition.

SKETCH OF MACHINERY TEST INSTALLATION

Sketch to show the following information:

- (i) Location of the mounts, connections
- (ii) Location of microphones and accelerometers
- (iii) Numbering scheme for accelerometers and microphones

Test Room Dimensions: Length - _____ Width - _____ Height-

Machine Identification Number:

Date:

Report Compiled By:

Job Title:

FIGURE 5

HALIFAX CLASS MACHINERY R & 0 AIRBORNE NOISE REQUIREMENTS

| MACHINE | EAC | OCTAVE BAND CENTRE FREQUENCY IN Hz dB REF 20µPa @ 1 metre | | | | | | | | |
|---|--------|---|-------|--------|--------|--------|------|-------|-------|-------|
| | | 31.5 Hz | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1kHz | 2 kHz | 4 kHz | 8 kHz |
| FUEL OIL BOOST & TRANSFER PUMP (FAST SPEED) | 25-548 | 67 | 60 | 59 | 60 | 57 | 65 | 64 | 62 | 55 |
| JP5 FUEL OIL SUPPLY PUMP | 39-168 | 72 | 60 | 64 | 70 | 75 | 74 | 70 | 65 | 60 |
| MD LUBE OIL PUMP | 25-549 | 75 | 70 | 73 | 75 | 70 | 70 | 70 | 64 | 60 |
| HP AIR COMPRESSOR | 27-899 | 55 | 55 | 66 | 72 | 72 | 74 | 70 | 69 | 67 |
| LP AIR COMPRESSOR | 27-886 | 55 | 55 | 60 | 70 | 80 | 80 | 82 | 80 | 75 |
| FUEL OIL CENTRIFUGE | 25-551 | 63 | 58 | 59 | 65 | 70 | 75 | 75 | 70 | 65 |
| LUBE OIL CENTRIFUGE | 25-547 | 63 | 55 | 54 | 60 | 60 | 68 | 66 | 63 | 57 |
| AUX SEAWATER CIRC PUMP | 27-880 | 61 | 61 | 56 | 55 | 53 | 58 | 52 | 48 | 41 |
| JOCKEY FIRE PUMP | 27-931 | 62 | 66 | 66 | 73 | 81 | 75 | 75 | 78 | 73 |
| MOTOR DRIVEN FIRE PUMP | 27-876 | 67 | 70 | 70 | 75 | 81 | 79 | 77 | 71 | 65 |
| SEWAGE COLLECTION EDUCTOR PUMP | 27-953 | 60 | 68 | 74 | 76 | 77 | 78 | 75 | 71 | 65 |
| COLD FRESH WATER PUMP | 27-879 | 60 | 60 | 62 | 60 | 61 | 68 | 72 | 78 | 62 |

TABLE 1

HALIFAX CLASS MACHINERY R & 0 POWER AVERAGE VIBRATION REQUIREMENTS

| MACHINE | EAC | OCTAVE BAND CENTRE FREQUENCY IN Hz VdB REF 10 ⁻⁸ m/s | | | | | | | | |
|--|--------|---|-------|--------|--------|--------|------|-------|-------|-------|
| | | 31.5 Hz | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1kHz | 2 kHz | 4 kHz | 8 kHz |
| FUEL OIL BOOST PUMP (FAST SPEED) | 25-548 | 82 | 84 | 81 | 78 | 80 | 80 | 74 | 66 | 63 |
| FUEL OIL TRANSFER PUMP (FAST SPEED) | 25-548 | 82 | 84 | 81 | 78 | 80 | 80 | 74 | 66 | 63 |
| JP5 FUEL OIL SUPPLY PUMP (ABOVE UPPER STAGE MOUNTS) | 39-168 | 85 | 87 | 94 | 92 | 90 | 85 | 75 | 70 | 65 |
| MD LUBE OIL PUMP (PUMP TO BE RESILIENTLY MOUNTED FOR TESTING AT R&O FACILITY) | 25-549 | 79 | 84 | 95 | 93 | 85 | 81 | 80 | 80 | 78 |
| HP AIR COMPRESSOR(ABOVE UPPER STAGE MOUNTS) | 27-899 | 104 | 102 | 105 | 103 | 95 | 86 | 80 | 75 | 75 |
| LP AIR COMPRESSOR | 27-886 | 97 | 86 | 95 | 100 | 90 | 89 | 82 | 82 | 75 |
| FUEL OIL CENTRIFUGE(ABOVE UPPER STAGE MOUNTS) | 25-551 | 98 | 85 | 85 | 94 | 88 | 87 | 82 | 77 | 75 |
| LUBE OIL CENTRIFUGE | 25-547 | 91 | 85 | 102 | 92 | 79 | 74 | 68 | 76 | 75 |
| AUX SEAWATER CIRC PUMP | 27-880 | 84 | 75 | 85 | 80 | 78 | 69 | 69 | 50 | 45 |
| JOCKEY FIRE PUMP | 27-931 | 86 | 86 | 87 | 96 | 90 | 82 | 82 | 77 | 76 |
| MOTOR DRIVEN FIRE PUMP | 27-876 | 90 | 94 | 84 | 98 | 95 | 87 | 84 | 82 | 80 |
| SEWAGE COLLECTION EDUCTOR PUMP | 27-953 | 90 | 95 | 92 | 85 | 90 | 80 | 80 | 72 | 65 |
| COLD FRESH WATER PUMP | 27-879 | 87 | 85 | 86 | 95 | 90 | 88 | 79 | 74 | 73 |

TABLE 2

APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

| DESCRIPTION | NSN | PART NO. | MANUFACTURER | EAC |
|-----------------------|------------------|-----------------|---------------------------------|-------|
| PUMP, ROTARY | 4320 12 338 6322 | LN164/210 FL-GL | Leistritz AG | 25319 |
| PUMP UNIT,CENTRIFUGAL | 4320 21 867 1152 | S53906 | Carter/FMC | 25328 |
| ROTATING ASSEMBLY | 4320 21 871 5370 | SPT-1268 | Carter/FMC | 25328 |
| PUMP UNIT, ROTARY | 4320 21 850 3236 | B10527 | Plenty Mirrlees Pumps | 25339 |
| PUMP UNIT,CENTRIFUGAL | 4320 21 850 3327 | B0215 | Grampotex | 27379 |
| PUMP UNIT,CENTRIFUGAL | 4320 01 331 2439 | 34464/SK-341 | Separation and Recovery Systems | 27911 |
| PUMP UNIT,ROTARY | 4320 21 911 2453 | 38960 | Sansom Equipment Ltd. | 27A90 |
| PUMP, CENTRIFUGAL | 4320 21 856 0323 | 81 1-4A6B | Gorman Rupp | 39108 |

APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 25319

IRO CLASS - GEAR DRIVEN MAIN LUBE OIL PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|-----------------|--------------------|-------------|
| 4320-12-338-6322 | LN164/210-FL-GL | Pump, Rotary | D9550 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump, Rotary consists of pump, and pump end coupling.

PERFORMANCE TEST CRITERIA

| | |
|--------------------|--|
| Flow | 3785 l/min. (833 IGPM) |
| Total Head | 4.8 Bar (142.2 In. Hg) |
| Pump Speed | 1330 RPM |
| Power Requirements | 43 kW (57.7 HP) |
| Viscosity Range | 80-90 mm ² /s (centistokes) |
| NPSH | 4.8 mWC (15.78 Ft. HD. H ₂ O) |

PERFORMANCE TEST NOTES

The main gearing drives this pump. A different mode of driving the pump will be required to conduct the performance test.

Operate pump at rated conditions for eight hours to prove flow rate.

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 25319

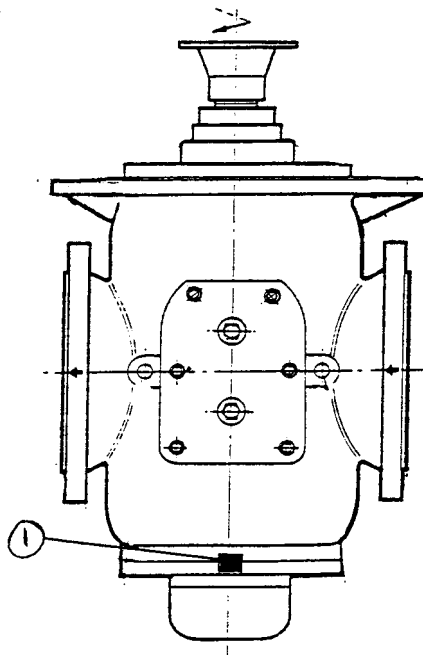
VIBRATION LEVELS

| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 16 | 100 |
| 31.5 | 105 |
| 63 | 111 |
| 125 | 102 |
| 250 | 93 |
| 500 | 92 |
| 1K | 94 |
| 2K | 91 |
| 4K | 85 |

VIBRATION TEST NOTES

The VA readings (fleet norms) were compiled from ships at sea, while operating at 200 shaft RPM with 32 degrees of pitch. These reading may be unsuitable for use as a repair standard.

Vibration block locations for the Gear Driven Main Lube Oil Pump are as indicated on attached drawing. The VA block location on the upper (driven end) of the pump, is fitted to the flange adapter. As this flange adapter is not returned with the pump, the VA block location is not shown. VA readings are to be taken at this end also.



APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 25328

COFFIN FEED PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|------------------------|-------------|
| 4320-21-867-1152 | S53906 | Pump Unit, Centrifugal | OAPJ5 |
| 4320-21-871-5370 | SPT-1268 | Rotating Assembly | OAPJ5 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit, Centrifugal consists of the pump, steam turbine, governor, dash pot assembly, oil cooler, steam strainer, turbine exhaust relief, and gland relief valve.

Rotating Assembly consists of the bucket wheel assembly, main shaft, impeller assembly, governor trip assembly, bearings, deflectors and fasteners.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|--------------------------|---------------|
| Pump Discharge Pressure | 758 PSIG |
| Pump Suction Pressure | 47 PSIG (min) |
| Pump Suction Temperature | 280 F |
| Pump Flow | 325 IGPM |

TURBINE

| | |
|--------------------------------|-------------|
| Steam Inlet Pressure | 580 PSIG |
| Steam Temperature | 515 F |
| Exhaust Pressure | 40 PSIG |
| Turbine Speed | 7130 RPM |
| L.O. Cooling Water Flow | 2-4 IGPM |
| L.O. Cooling Water Temperature | 85 °F (max) |
| Overspeed Trip Setting | 8300 RPM |
| Casing Relief Valve Setting | 50 PSIG |

PERFORMANCE TEST NOTES

Record following data hourly for 4 hours: flow rate; discharge pressure; inlet pressure, inlet temperature and speed. Pump to have an endurance run time of 8 hours (which includes the 4 previous hours).

The rotating assembly is to be dynamically balanced to manufacture's specification.

APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 25328

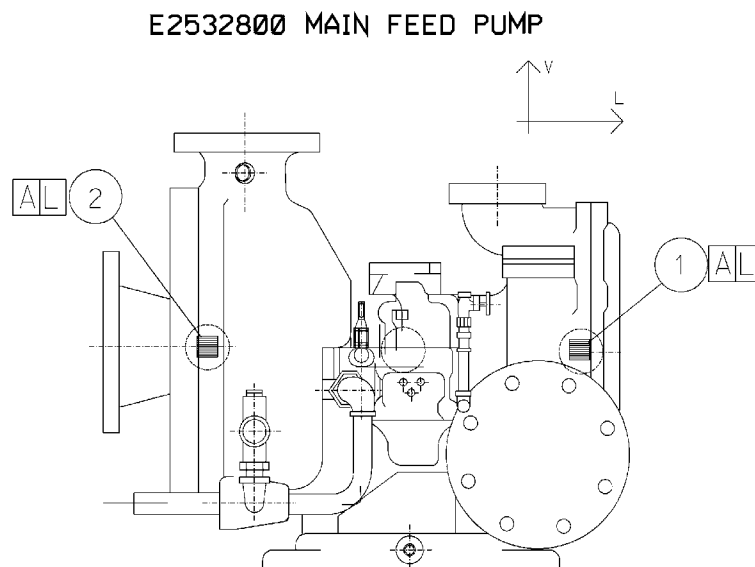
VIBRATION LEVELS

| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 16 | 95 |
| 31.5 | 94 |
| 63 | 90 |
| 125 | 105 |
| 250 | 90 |
| 500 | 88 |
| 1K | 90 |
| 2K | 92 |
| 4K | 95 |

VIBRATION TESTING NOTES

Vibration readings are to be taken while operating unit at design flow only on blocks 1 and 2 as shown below.

Vibration Block Locations for Coffin Feed Pump



APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 25339

PTR CLASS - FUEL OIL TRANSFER PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|--------------------|-------------|
| 4320-21-850-3236 | B10527 | Pump Unit, Rotary | K2596 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Rotary consists of the pump, bracket and motor.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|--------------------|----------|
| Discharge Pressure | 93 PSIG |
| Suction Pressure | 0 PSIG |
| Flow | 140 IGPM |

MOTOR

| | |
|---------|-----------|
| Voltage | 440 Volts |
| Current | 30 Amps |
| Speed | 1150 RPM |

PERFORMANCE TEST NOTES

Unit to be operated at rated conditions for eight hours after readings have stabilised.

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 25339

VIBRATION LEVELS

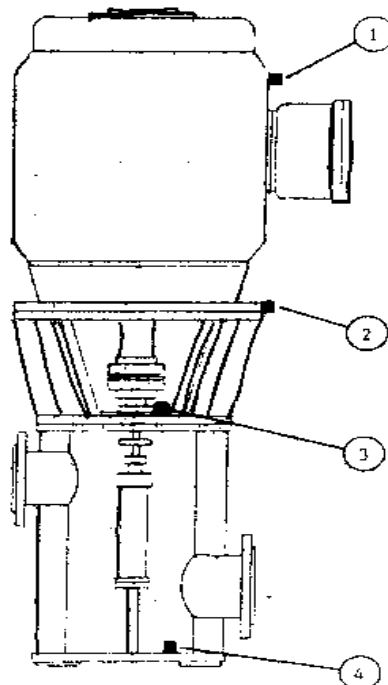
| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 16 | 94 |
| 31.5 | 87 |
| 63 | 91 |
| 125 | 89 |
| 250 | 83 |
| 500 | 84 |
| 1K | 85 |
| 2K | 85 |
| 4K | 80 |

VIBRATION TEST NOTES

VA reading to be taken while unit is operating at rated conditions.

Motor Vibration Category: A

Vibration block locations for the Fuel Oil Transfer Pump are as indicated on the attached drawing.



APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 27379

PUMP UNIT CENTRIFUGAL

| <u>NSN:</u> | <u>P/N</u> | <u>ITEM NAME</u> | <u>NSCM</u> |
|------------------|------------|------------------------|-------------|
| 4320-21-850-3327 | B0215 | Pump Unit, Centrifugal | 35074 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Centrifugal, consists of the pump directly coupled to the electric motor.

PERFORMANCE TEST CRITERIA

| | |
|---------------------|----------|
| Flow | 252 IGPM |
| Discharge Pressures | 110 Feet |

MOTOR

| | |
|---------------------|----------|
| Rating | 15 BHP |
| Speed (Synchronous) | 1760 RPM |
| Frame Size | GE 284UC |
| Volts | 440 |
| Amps | 19 |
| Hertz | 60 |
| Phase | 3 |

PERFORMANCE TEST NOTES

Record following data hourly for 4 hours: flow rate; discharge pressure; inlet pressure, inlet temperature, speed; volts; amps; K watts; power factor; and time.

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 27379

VIBRATION LEVELS

| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 16 | 101 |
| 31.5 | 100 |
| 63 | 95 |
| 125 | 99 |
| 250 | 96 |
| 500 | 90 |
| 1K | 95 |
| 2K | 92 |
| 4K | 90 |

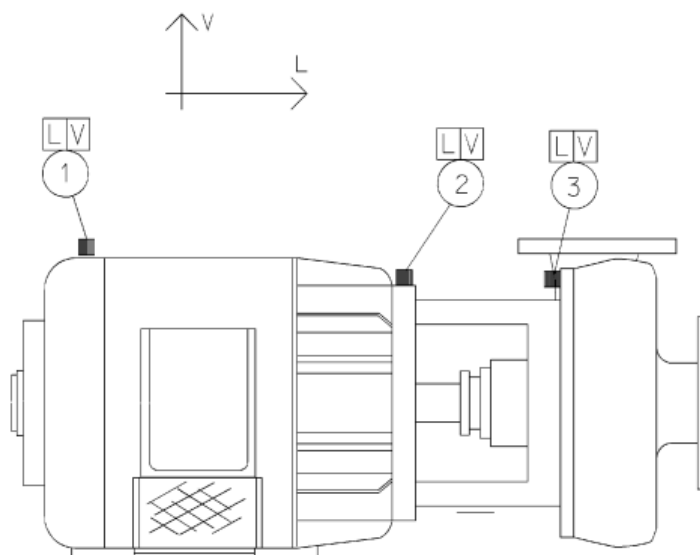
VIBRATION TESTING NOTES

Vibration readings are to be taken while operating unit at design flow only on blocks 1, 2 and 3 as shown below.

Motor Vibration Category: B

Vibration Block Locations for 252 GPM Designed for Brine

E2737900 EVAPORATOR BRINE PUMP



APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 27911

CPF CLASS OILY WATER SEPARATOR PUMP

| <u>NSN:</u> | <u>P/N</u> | <u>ITEM NAME</u> | <u>NSCM</u> |
|------------------|--------------|------------------|-------------|
| 4320 01 331 2439 | 34464/SK-341 | Pump Unit Rotary | 53918 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Rotary, consists of the pump, electric motor, and coupling.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|--------------------|---------|
| Discharge Pressure | 45 PSIG |
| Suction Pressure | 25 ft |
| Flow | 10 IGPM |

ELECTRIC MOTOR

| | |
|--------|---------------------|
| Rating | 0.5 HP |
| Speed | 1425 / 1725 RPM |
| Volts | 230/ 460 VAC, 60 Hz |
| Amps | 2.4/1.2 |

PERFORMANCE TEST NOTES

Operate unit for two hours after readings have stabilised at rated conditions.

VIBRATION LEVELS

Vibration levels for pump assemblies are to be within manufacturer's repair specifications. No VA blocks fitted.

Motor Vibration Category: C

APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 27A90

CPF CLASS BILGE STRIPPING PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|-----------------|--------------------|-------------|
| 4320 21 911 2453 | F000708/2 | Pump Unit, Rotary | 38960 |
| 4320 99 513 7755 | CAB12H1R3/A1115 | Pump, Rotary | K2605 |
| 3010 01 394 1145 | RX61DT80N4 | Gear case/motor | 62672 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Rotary, consists of the pump, gear case/electric motor, and base plate.

Pump Rotary, consists of the pump end only.

Gear case/motor, consists of reduction gearing and a/c motor.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|---------------------------|-----------------------------------|
| Max Differential Pressure | 87 psig |
| Flow | 57cubic meters/hr @1450 motor RPM |
| Max Pump RPM | 575 RPM |

ELECTRIC MOTOR

| | |
|--------|----------|
| Rating | 1 HP |
| Speed | 1500 RPM |
| Volts | 440/60/3 |
| Amps | 4.2 |

PERFORMANCE TEST NOTES

Operate unit for four hours after readings have stabilized at rated conditions.

VIBRATION LEVELS

Vibration levels for pump assemblies are to be within manufacturer's repair specifications. No VA blocks fitted.

Motor Vibration Category: C

APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 27B00

FIRST STAGE PUMP UNIT

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|--------------|---------------------|-------------|
| 4320-01-381-0285 | L1122D-RODCN | Pump, Reciprocating | 50492 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Reciprocating, consists of the pump end only.

PERFORMANCE TEST CRITERIA

Not applicable.

PERFORMANCE TEST NOTES

Not applicable.

VIBRATION LEVELS

Not applicable.

APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 27B01

SECOND STAGE PUMP UNIT

| NSN | P/N | DESCRIPTION | NSCM |
|------------------|------------|---------------------|-------|
| 4320-01-381-0377 | M0406AB-RO | Pump, Reciprocating | 36219 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Reciprocating, consists of the pump end only.

PERFORMANCE TEST CRITERIA

Not applicable.

PERFORMANCE TEST NOTES

Not applicable.

VIBRATION LEVELS

Not applicable.

APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 39108

IRO CLASS - JP5 SUMP PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|--------------------|-------------|
| 4320-21-856-0323 | 81 1-4A6B | Pump, Centrifugal | 21056 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Centrifugal consist of pump only.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|--------------------|-----------------|
| Discharge Pressure | 12 PSIG |
| Suction Pressure | 10 in. HG (Max) |
| Flow | 20 GPM |
| Speed | 3480 RPM |

MOTOR

| | |
|---------|-----------|
| Speed | 3480 RPM |
| Voltage | 440 VOLTS |
| Current | 0.55 AMPS |
| Power | 1/3 HP |

VIBRATION LEVELS

Vibration levels for pump assemblies are to be within manufacturer's repair specifications. No VA blocks fitted.

Motor Vibration Category: C

APPENDIX 6

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #3 (MISCELLANEOUS)

EAC 39169

HFX CLASS - JP5 SYSTEM PRIMING PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|---------------------|-------------|
| 4320-01-332-5307 | M8SOVTTFVT | Pump, Reciprocating | 52837 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Reciprocating consists of the air pump only.

PERFORMANCE TEST

| | |
|---------------------|-------------------------|
| Suction Lift | 3 Meters Water Column |
| Flow Rate | 22.8 M ³ /HR |
| Discharge Pressure | 0 PSI - Open Discharge |
| Air Supply Pressure | 120 PSI |

PERFORMANCE TEST NOTES

The pump shall be run for a period of 2 hours at the required suction lift, during which time the flow rate will be checked.

HYDROSTATIC TEST

The test pressure shall be held for 15 minutes, during this time there shall be no pressure drop, no permanent distortion, and no leaks.

| | |
|---------------|------------|
| Holding Time | 15 Minutes |
| Test Pressure | 190 PSI |

VIBRATION LEVELS

Not applicable.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

| DESCRIPTION | NSN | PART NO. | MANUFACTURER | EAC |
|-----------------------|------------------|-----------------------------|-------------------|-------|
| PUMP,CENTRIFUGAL | 4320-21-904-1991 | FF704103 | Ingersoll-Dresser | 25534 |
| PUMP,CENTRIFUGAL | 4320-21-904-1992 | FF704204 | Ingersoll-Dresser | 25534 |
| PUMP UNIT,CENTRIFUGAL | 4320 21 856 0286 | 3NVMK50 | Ingersoll-Dresser | 27334 |
| PUMP UNIT,CENTRIFUGAL | 4320 21 856 0290 | 1-1-2NVMK20 | Ingersoll-Dresser | 27335 |
| PUMP UNIT,CENTRIFUGAL | 4320-21-904-1983 | 15487N18 <u>or</u> 13869N18 | Ingersoll-Dresser | 27876 |
| PUMP,CENTRIFUGAL | 4320-21-907-5967 | FF704191 | Ingersoll-Dresser | 27877 |
| PUMP UNIT,CENTRIFUGAL | 4320-21-904-1976 | Ff704100-0 | Ingersoll-Dresser | 27878 |
| PUMP UNIT,CENTRIFUGAL | 4320-21-904-1965 | FF704106-0 | Ingersoll-Dresser | 27879 |
| PUMP UNIT,CENTRIFUGAL | 4320-21-904-1985 | FF704112-0 | Ingersoll-Dresser | 27880 |
| PUMP UNIT,CENTRIFUGAL | 4320-21-904-1989 | FF704118-0 | Ingersoll-Dresser | 27931 |
| PUMP UNIT,CENTRIFUGAL | 4320-21-904-1973 | FF704109-0 | Ingersoll-Dresser | 39164 |

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 25534

HFX CLASS - GEAR DRIVEN MAIN SEA WATER PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|--------------------------|-------------|
| 4320-21-904-1991 | FF704103 | Pump, Centrifugal (Stbd) | 05563 |
| 4320-21-904-1992 | FF704204 | Pump, Centrifugal (Port) | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump, Centrifugal consists of pump only.

PERFORMANCE TEST CRITERIA

| | |
|--------------|------------------------|
| Flow | 175 M ³ /HR |
| Total Head | 0.81 Bar |
| Shaft Speed | 1200 RPM |
| Motor Rating | 7 BHP |

PERFORMANCE TEST NOTES

Driver not supplied. Test facility to be set up to demonstrate performance.

VIBRATION LEVELS

| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 31.5 | 97 |
| 63 | 100 |
| 125 | 97 |
| 250 | 93 |
| 500 | 90 |
| 1K | 87 |
| 2K | 83 |
| 4K | 80 |

VIBRATION TESTING NOTES

VA testing to be done on test base plate (to be fitted with VA blocks) mounted via resilient mounts sized according to weight.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27334

IRO CLASS - MAIN FIRE PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|------------------------|-------------|
| 4320-21-856-0286 | 3NMK50 | Pump Unit, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit, Centrifugal, consists of the pump, electric motor, and coupling.

PERFORMANCE TEST CRITERIA

| | |
|---------------------|----------|
| Flow | 325 IGPM |
| Discharge Pressures | 125 PSIG |
| Suction Lift | Flooded |

MOTOR

| | |
|---------------------|----------|
| Rating | 50 BHP |
| Speed (Synchronous) | 3535 RPM |
| Volts | 440 |
| Amps | 61 |
| Hertz | 60 |
| Phase | 3 |

PERFORMANCE TEST NOTES

Record following data hourly for 4 hours: flow rate; discharge pressure; inlet pressure, inlet temperature, speed; volts; amps; K watts; power factor; and time.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27334

VIBRATION LEVELS

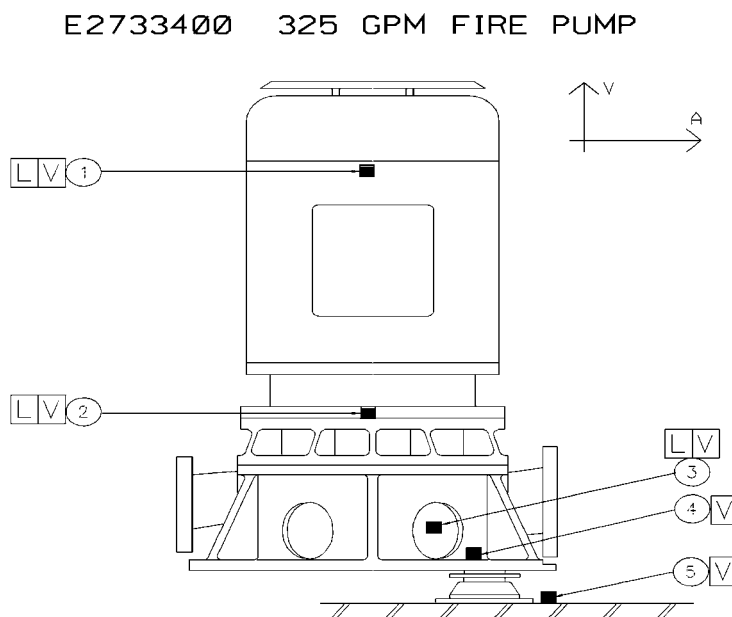
| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 31.5 | 100 |
| 63 | 103 |
| 125 | 100 |
| 250 | 105 |
| 500 | 104 |
| 1K | 96 |
| 2K | 102 |
| 4K | 100 |

VIBRATION TESTING NOTES

Vibration readings are to be taken while operating at design flow only on blocks 1, 2, 3 and 4 as shown below.

Motor Vibration Category: A

Vibration Block Locations for 280 CL Main Fire Pump



APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27335

IRO CLASS - JOCKEY FIRE PUMP

| <u>NSN:</u> | <u>P/N</u> | <u>ITEM NAME</u> | <u>NSCM</u> |
|------------------|-------------|------------------------|-------------|
| 4320-21-856-0290 | 1-1-2NVMK20 | Pump Unit, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit, Centrifugal, consists of the pump, electric motor, and coupling.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|----------------------------------|----------|
| Flow | 100 IGPM |
| Discharge Pressures (Total Head) | 125PSIG |
| Suction Lift | Flooded |

MOTOR

| | |
|---------------------|----------|
| Rating | 20 BHP |
| Speed (Synchronous) | 3535 RPM |
| Frame Size | 286PX |
| Volts | 440 |
| Amps | 24.5 |
| Hertz | 60 |
| Phase | 3 |

PERFORMANCE TEST NOTES

Record following data hourly for 4 hours: flow rate; discharge pressure; inlet pressure, inlet temperature, speed; volts; amps; K watts; power factor; and time.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27335

VIBRATION LEVELS

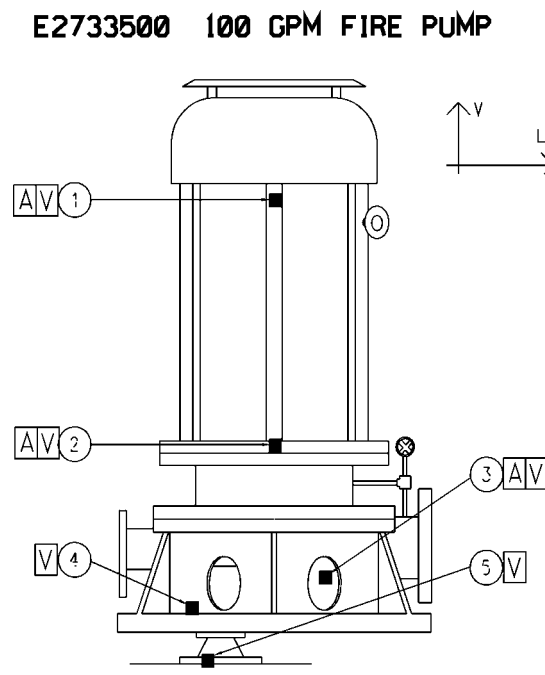
| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 31.5 | 97 |
| 63 | 100 |
| 125 | 97 |
| 250 | 102 |
| 500 | 101 |
| 1K | 93 |
| 2K | 99 |
| 4K | 97 |

VIBRATION TESTING NOTES

Vibration readings are to be taken while operating at design flow only on blocks 1, 2, 3 and 4 as shown below.

Motor Vibration Category: A

Vibration Block Locations for 280 CL Jockey Fire Pump



A7-6/21

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27876

HFX CLASS - MOTOR DRIVEN FIRE PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|----------------------|------------------------|-------------|
| 4320-21-904-1983 | 15487N18 or 13869N18 | Pump Unit, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Centrifugal consists of pump and motor. Note: All pump ends are the same and Chesterton type 180 mechanical seal is used on all main fire pumps (see drawings #901169 Adapter for 180-16 Seal Hull & Fire Pump and #37240 rev A Seal Installation).

PERFORMANCE TEST CRITERIA

PUMP

| | |
|------------|------------------------|
| Flow | 146 M ³ /HR |
| Total Head | 10 Bar |

MOTOR

| | |
|---------------------|----------|
| Rating | 75 HP |
| Speed (Synchronous) | 3550 RPM |
| Volts | 440 |
| Amps | 85 |
| Hertz | 60 |
| Phase | 3 |

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

PERFORMANCE TEST NOTES

1. The contractor shall test the hydraulic performance and vibration levels of each pump and motor on a suitable test loop.
2. Pump characteristic curves will be produced. Specific readings will be taken as close as possible to the specified points for each pump.
3. In addition to the maximum vibration levels required below, noise and vibration readings shall be taken in accordance to the test procedures and specifications provided in Appendix A3 of Annex A. The maximum acceptable noise and vibration limits that must be achieved on the complete pump unit are provided in Tables 1 and 2 of the fore mentioned Appendix.

APPENDIX 7

To: ANNEX A To W8482-116492

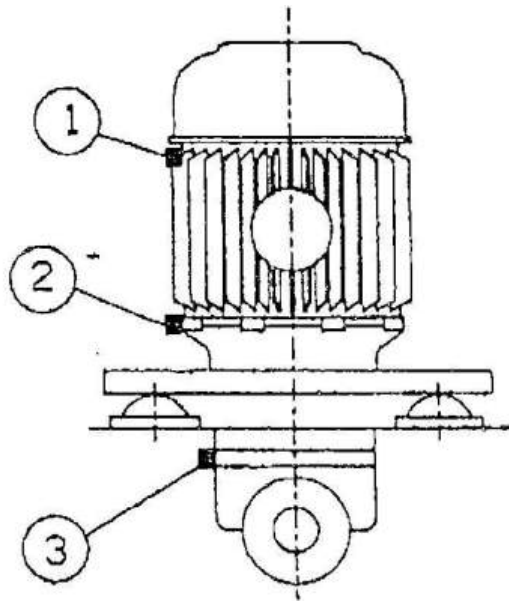
Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27876

VIBRATION TEST NOTES

Motor Vibration Category: A



Vibration block locations are as indicated on the attached drawing.

Block 1: On motor body/frame, left side (when facing terminal box cover), 1 inch below fan hood.

Block 2: On motor drive end head flange, left side.

Block 3: On pump support head flange, left side.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27877

HFX CLASS - DIESEL DRIVEN FIRE PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|--------------------|-------------|
| 4320-21-907-5967 | FF704191 | Pump, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump, Centrifugal consists of pump only.

PERFORMANCE TEST CRITERIA

| | |
|--------------|------------------------|
| Flow | 146 M ³ /HR |
| Total Head | 10 Bar |
| Shaft Speed | 2700 RPM |
| Motor Rating | 75 HP |

PERFORMANCE TEST NOTES

Diesel driver not supplied. Test facility to be set up to demonstrate performance.

VIBRATION LEVELS

| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 31.5 | 109 |
| 63 | 105 |
| 125 | 95 |
| 250 | 100 |
| 500 | 92 |
| 1K | 92 |
| 2K | 88 |
| 4K | 88 |

VIBRATION TESTING NOTES

VA testing to be done on test base plate (to be fitted with VA blocks) mounted via resilient mounts sized according to weight.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27878

HFX CLASS - MAIN FRESH WATER PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|------------------------|-------------|
| 4320-21-904-1976 | FF704100-0 | Pump Unit, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Centrifugal consists of pump and motor.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|------------|-------------------------|
| Flow | 0.55 M ³ /HR |
| Total Head | 0.55 Bar |

MOTOR

| | |
|---------------------|----------|
| Rating | 0.5 HP |
| Speed (Synchronous) | 1800 RPM |
| Volts | 440 |
| Amps | 0.8 |
| Hertz | 60 |
| Phase | 3 |

PERFORMANCE TEST NOTES

The contractor shall test the hydraulic performance and vibration levels of each pump and motor on a suitable test loop.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27878

VIBRATION LEVELS

| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 31.5 | 90 |
| 63 | 92 |
| 125 | 89 |
| 250 | 85 |
| 500 | 83 |
| 1K | 80 |
| 2K | 77 |
| 4K | 74 |

VIBRATION TEST NOTES

Motor Vibration Category: C

Vibration blocks to be mounted on pump base plate.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27879

HFX CLASS - MAIN FRESH WATER PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|------------------------|-------------|
| 4320-21-904-1965 | FF704106-0 | Pump Unit, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Centrifugal consists of pump end, vacuum pump, motor, piping, and check, flex and relief valves.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|------------|-----------------------|
| Flow | 14 M ³ /HR |
| Total Head | 4 Bar |

MOTOR

| | |
|---------------------|----------|
| Rating | 7.5 HP |
| Speed (Synchronous) | 3550 RPM |
| Volts | 440 |
| Amps | 9.1 |
| Hertz | 60 |
| Phase | 3 |

PERFORMANCE TEST NOTES

1. Performance of priming pump to be demonstrated with 7 M suction. Fresh water pump to maintain prime after initial priming.
2. The contractor shall test the hydraulic performance and vibration levels of each pump and motor on a suitable test loop.
3. Pump characteristic curves will be produced. Specific readings will be taken as close as possible to the specified points for each pump.
4. In addition to the maximum vibration levels required below, noise and vibration readings shall be taken in accordance to the test procedures and specifications provided in Appendix A3 of Annex A. The maximum acceptable noise and vibration limits that must be achieved on the complete pump unit are provided in Tables 1 and 2 of the fore mentioned Appendix.

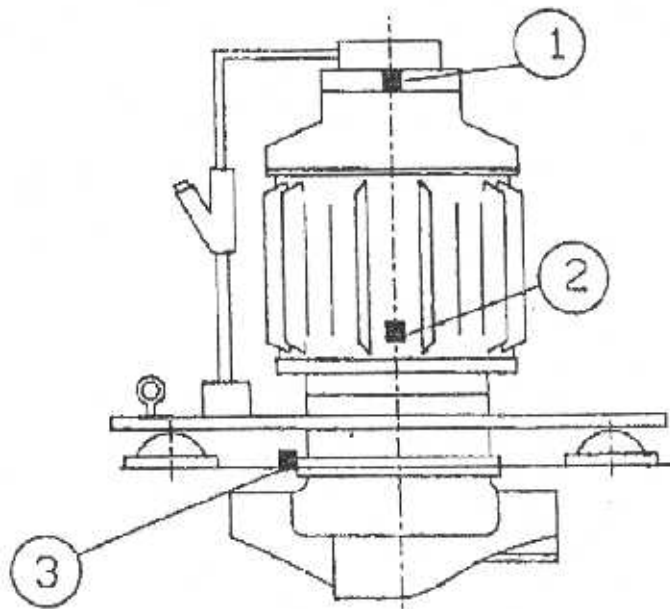
PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27879

VIBRATION TEST NOTES

Motor Vibration Category: B

Vibration block locations are as indicated on the attached drawing.



Block 1: On motor non-drive end, top flange, back side (when facing the terminal box cover)

Block 2: On motor body / frame, 1 inch above drive end head flange, back side.

Block 3: On pump support head flange, right side.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27880

HFX CLASS - AUXILIARY SEA WATER CIRCULATING PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|------------------------|-------------|
| 4320-21-904-1985 | FF704112-0 | Pump Unit, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Centrifugal consists of pump and motor.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|------------|------------------------|
| Flow | 154 M ³ /HR |
| Total Head | 1.2 Bar |

MOTOR

| | |
|---------------------|----------|
| Rating | 10 HP |
| Speed (Synchronous) | 1150 RPM |
| Volts | 440 |
| Amps | 14 |
| Hertz | 60 |
| Phase | 3 |

PERFORMANCE TEST NOTES

1. The contractor shall test the hydraulic performance and vibration levels of each pump and motor on a suitable test loop.
2. Pump characteristic curves will be produced. Specific readings will be taken as close as possible to the specified points for each pump.
3. The contractor shall demonstrate the watertight integrity of the auxiliary seawater circulating pump motor. He will carry out a vacuum/pressure test, which will demonstrate that the Auxiliary Seawater Circulating Pump is water proof to a depth of 15 ft. while running.
4. In addition to the maximum vibration levels required below, noise and vibration readings shall be taken in accordance to the test procedures and specifications provided in Appendix A3 of Annex A. The maximum acceptable noise and vibration limits that must be achieved on the complete pump unit are provided in Tables 1 and 2 of the fore mentioned Appendix.

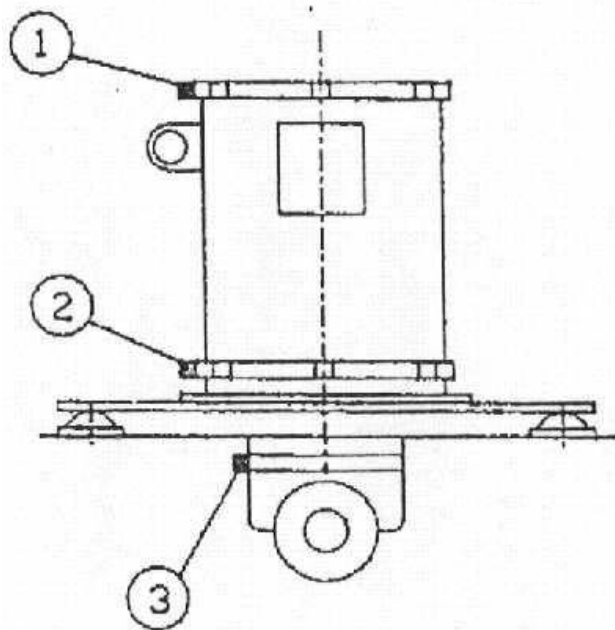
PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27880

VIBRATION TEST NOTES

Motor Vibration Category: B

Vibration block locations are as indicated on the attached drawing.



Block 1: On motor non-drive end, head flange, left side (when facing the terminal box cover)

Block 2: On motor drive end head flange, left side.

Block 3: On pump support head flange, left side.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27931

HFX CLASS - JOCKEY FIRE PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|-------------|------------------------|-------------|
| 4320-21-904-1989 | FF7044118-0 | Pump Unit, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Centrifugal consist of pump and motor

PERFORMANCE TEST CRITERIA

PUMP

| | |
|------------|-----------------------|
| Flow | 80 M ³ /HR |
| Total Head | 10 Bar |

MOTOR

| | |
|---------------------|----------|
| Rating | 50 HP |
| Speed (Synchronous) | 3550 RPM |
| Volts | 440 |
| Amps | 58 |
| Hertz | 60 |
| Phase | 3 |

PERFORMANCE TEST NOTES

1. The contractor shall test the hydraulic performance and vibration levels of each pump and motor on a suitable test loop.
2. Pump characteristic curves will be produced. Specific readings will be taken as close as possible to the specified points for each pump.
3. In addition to the maximum vibration levels required below, noise and vibration readings shall be taken in accordance to the test procedures and specifications provided in Appendix A3 of Annex A. The maximum acceptable noise and vibration limits that must be achieved on the complete pump unit are provided in Tables 1 and 2 of the fore mentioned Appendix.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

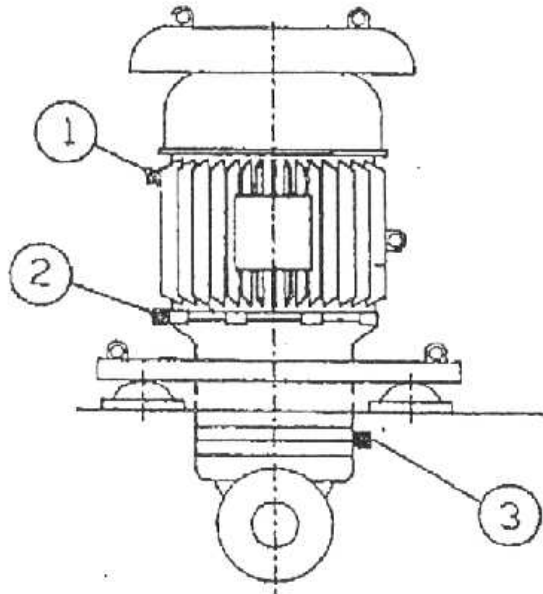
PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 27931

VIBRATION TEST NOTES

Motor Vibration Category: A

Vibration block locations are as indicated on the attached drawing.



Block 1: On motor body/frame, left side (when facing terminal box cover), 1 in below fan hood.

Block 2: On motor drive end head flange, left side.

Block 3: On pump support head flange, right side.

APPENDIX 7

To: ANNEX A To W8482-116492

Dated: 5 Nov 2010

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 39164

HFX CLASS - HELO WASHDOWN PUMP

| <u>NSN</u> | <u>P/N</u> | <u>DESCRIPTION</u> | <u>NSCM</u> |
|------------------|------------|------------------------|-------------|
| 4320-21-904-1973 | FF704109-0 | Pump Unit, Centrifugal | 05563 |

EQUIPMENT CONFIGURATION CHECKLIST

Pump Unit Centrifugal consists of pump and motor.

PERFORMANCE TEST CRITERIA

PUMP

| | |
|------------|------------------------|
| Flow | 2.4 M ³ /HR |
| Total Head | 5 Bar |

MOTOR

| | |
|---------------------|----------|
| Rating | 5 HP |
| Speed (Synchronous) | 3550 RPM |
| Volts | 440 |
| Amps | 6.3 |
| Hertz | 60 |
| Phase | 3 |

PERFORMANCE TEST NOTES

The contractor shall test the hydraulic performance and vibration levels of each pump and motor on a suitable test loop.

Pump characteristic curves will be produced. Specific readings will be taken as close as possible to the specified points for each pump.

PERFORMANCE SHEETS – GROUP #4 (INGERSOLL-DRESSER)

EAC 39164

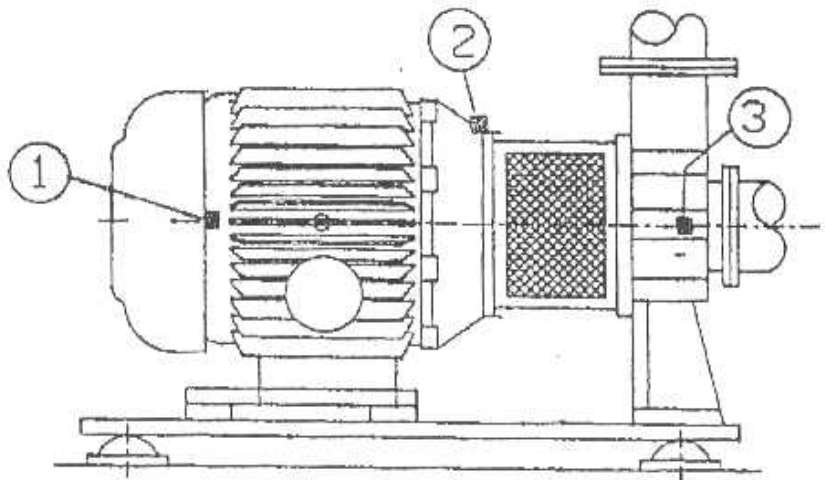
VIBRATION LEVELS

| Octave Band Frequency (Hz) | Maximum Level (VdB) |
|-------------------------------|------------------------|
| 31.5 | 87 |
| 63 | 90 |
| 125 | 86 |
| 250 | 90 |
| 500 | 82 |
| 1K | 77 |
| 2K | 74 |
| 4K | 70 |

VIBRATION TEST NOTES

Motor Vibration Category: B

Vibration block locations are as indicated on the attached drawing.



Block 1: On motor non-drive end housing, front side (when facing the terminal box cover), on boss 2 inches above cooling ribs.

Block 2: On motor drive end coupling flange, top side.

Block 3: On pump impeller casing, front side.