Public Works And Government Services Canada | Travaux publics et Services gouvernementaux Canada

Part – Partie 1 of – de 1

RETURN RESPONSES TO:
RETOURNER LES RÉPONSES À:

PWGSC/ TPSGC
Place Bonaventure
800 de la Gauchetière Ouest
7e étage/ 7th Floor
Montreal, Quebec,
Canada
H5A 1L6

REQUEST FOR PROPOSAL (RFP)

DEMANDE DE PROPOSITIONS (DDP)

Comments – Commentaires

Issuing Office - Bureau de distribution

Space Programs Directorate /
Direction des programmes spatiaux
6767 route de l'Aéroport
Longueuil, Quebec, Canada
J3Y 8Y9

Canada

Titre – Sujet
Replacement of Mobile Servicing System Cameras on the International Space Station (ISS)

Remplacement des caméras du Système d'entretien mobile de la station spatiale internationale (SSI)

Solicitation No. - N° de l'invitation	Amendment No. - N° modif.
9F052-13-0905	N/A
Client Reference No. - N° de référence du client	**Date**
9F052-13-0905	12-11-2014
GETS Ref. No. - N° de réf. de SEAG	
File No. - N° de dossier	**CCC No./N° CCC - FMS No/N° VME**
9F052-13-0905	N/A

Solicitation Closes - L'invitation prend fin :
at - à 2:00 pm
On - le January 23rd, 2015

Time Zone Fuseau horaire
Eastern Standard Time (EST)

F.O.B - F.A.B.
Plant-Usine : ☐ **Destination :** ☒ **Other-Autre :** ☐

Address Enquiries to: - Adresser toutes questions à:	Buyer Id - Id de l'acheteur
Jessie Jutras	-
Telephone No. - N° de téléphone	**FAX No. - N° de FAX**
450-926-6670	N/A

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
Canadian Space Agency
6767 route de l'Aéroport
Longueuil, Quebec, Canada
J3Y 8Y9

Instructions : See Herein
Instructions : Voir aux présentes

Vendor / Firm Name and Address
Raison sociale et adresse du fournisseur / de l'entrepreneur

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
See herein	

Vendor / Firm Name and Address
Raison sociale et addresse du fournisseur / de l'entrepreneur

Telephone No. - N° de téléphone
Facsimile No. - N° de télécopieur

Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)

Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)

Signature **Date**

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Attachment 1 to Part 2 Mandatory Non-Disclosure agreement
Attachment 1 to Part 3 Technical and Managerial Bid Preparation Instructions
Attachment 1 to Part 4 Mandatory and Point Rated Evaluation Criteria
Attachment 1 to Part 5 Federal Contractors Program for Employment Equity – Certification

PART 1 - GENERAL INFORMATION

1.1 Introduction

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

Part 1 General Information: provides a general description of the requirement;

Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation;

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, and the basis of selection;

Part 5 Certifications: includes the certifications to be provided;

Part 6 Security, 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 following Annexes:

Annex "A" Statement of Work
Annex "B" Basis of Payment and Milestone schedule
Annex "C" Security Requirements Check List
Annex “D” Non-disclosure Agreement
Annex "E" Disclosure certification

The following Attachments:

Attachment 1 to Part 2 Mandatory Non-Disclosure agreement
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Attachment 1 to Part 4 Mandatory and Point Rated Evaluation Criteria
Attachment 1 to Part 5 Federal Contractors Program for Employment Equity – Certification

1.2 Summary

Project title

Replacement of Mobile Servicing System Cameras on the International Space Station (ISS).

Description

Public Works and Government Services Canada (PWGSC) on behalf of Canadian Space Agency (CSA) located in St-Hubert, (Quebec), is planning to provide replacement of Cameras & Lights to the Mobile Servicing System (MSS) on the ISS**.**

Period of Contract

The contract issued will be for a period of 15 months for Phase B and C and with an optional Phase D of 13 months.

Security Requirements

There is a security requirement associated with this requirement. For additional information, consult Part 6 - Security, Financial and Other Requirements, and Part 7 - Resulting Contract Clauses. For more information on personnel and organization security screening or security clauses, bidders should refer to the Canadian Industrial Security Directorate (CISD), Industrial and Security Program of Public Works and Government Services Canada website".

Integrity provisions for procurement

This requirement is subjected to the Integrity Provisions for Procurement. Bidders must provide a list of names, or other related information as needed, pursuant to section 01 of Standard Instructions 2003 (2014-09-25). Please, also refer to Part 5 – Certifications.

Former Public Servant

For services requirements, Bidders must provide the required information as detailed in article 2.4 of Part 2 of *the bid solicitation*, in order to comply with Treasury Board policies and directives on contracts awarded to former public servants.

Trade agreements

This requirement is not subject to the trade agreements as per the following dispositions:

- Agreement on Internal Trade (AIT):
Chapter 5, Annex 502.1A

- World Trade Organization Agreement on Government Procurement (WTO-AGP):
Appendix I, Annex I

- North American Free Trade Agreement (NAFTA)
Chapter 10, Annex 1001.1a-1

- Canada - Chile Free Trade Agreement
Annex Kbis-01, 1-1

- Canada - Peru Free Trade Agreement
Annex 1401.1-1

- Canada-Colombia Free Trade Agreement
Annex 1401-1

Canadian Content

The requirement is limited to Canadian goods and services.

Production of and/or access to controlled goods

This procurement is subject to the Controlled Goods Program

Federal Contractors Program for Employment Equity

There is a Federal Contractors Program (FCP) for employment equity requirement associated with this procurement; see Part 5 - Certifications, Part 7 - Resulting Contract Clauses and the attachment named Federal Contractors Program for Employment Equity - Certification.

1.3 Debriefings

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

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* 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 (2014-09-25) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

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

Delete: sixty (60) days
Insert: three hundred and sixty (360) days

2.1.1 Mandatory Non-Disclosure Agreement Requirement

If a Supplier or a subcontractor wishes to review the documents in the following table, it must request the documents from the Contracting Authority listed below through e-mail. The above mentioned documents contain information that is confidential or proprietary to Canada or third party. The Supplier or any subcontractor must sign a Non-Disclosure Agreement in the form set out in Attachment 1 to Part 2 and return the original duly signed to the Contracting Authority before being provided with a copy of the documents mentioned above. All Suppliers must return the documents mentioned above at the end of the RFP period, or upon request from the Contracting Authority within thirty (30) days following that request.

01	51612-0003	Component Envelope, SSRMS
02	51602-0517	MSS Television Camera, SCD
03	51602-0518	Camera HD & Zoom Lens, MSS TVC, ICD
04	51612-4012	CLA Assembly Dwg
05	51612-3004	CLPA Assembly Dwg
06	51602-0415	Camera Control Unit, ICD
07	51612-3294	Light Assembly, SCD
08	51612-3233	Pan & Tilt Unit, SSRMS MBS, SCD
09	51612-4968	TVC Lens Cover Assy
10	71612-5000	FRAME, Lens Cover Assembly
11	51612-4968	Lens Cover Assembly, SSRMS

All other applicable documents, sub-documents and reference documents that are not confidential or proprietary to Canada or third party will be made available upon request to the Contracting Authority.

2.2 *SACC* Manual Clauses

A7035T (2007-05-25), List of Proposed Subcontractors

2.3 Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

Due to the nature of the bid solicitation, bids transmitted by facsimile to PWGSC will not be accepted.

2.4. Former Public Servant

Contracts awarded to former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts awarded to FPSs, bidders must provide the information required below before contract award. If the answer to the questions and, as applicable the information required have not been received by the time the evaluation of bids is completed, Canada will inform the Bidder of a time frame within which to provide the information. Failure to comply with Canada's request and meet the requirement within the prescribed time frame will render the bid non-responsive.

Definitions

For the purposes of this clause,"**former public servant**" is any former member of a department as defined in the *Financial Administration Act*, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

a. an individual;

b. an individual who has incorporated;

c. a partnership made of former public servants; or

d. a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"**lump sum payment period**" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"**pension**" means a pension or annual allowance paid under the *Public Service Superannuation Act* (PSSA), R.S., 1985, c. P-36, and any increases paid pursuant to the *Supplementary Retirement Benefits Act*, R.S., 1985, c. S-24 as it affects the PSSA. It does not include pensions payable pursuant to the *Canadian Forces Superannuation Act*, R.S., 1985, c. C-17, the *Defence*

Services Pension Continuation Act, 1970, c. D-3, the *Royal Canadian Mounted Police Pension Continuation Act* , 1970, c. R-10, and the *Royal Canadian Mounted Police Superannuation Act*, R.S., 1985, c. R-11, the *Members of Parliament Retiring Allowances Act*, R.S. 1985, c. M-5, and that portion of pension payable to the *Canada Pension Plan Act*, R.S., 1985, c. C-8.

Former Public Servant in Receipt of a Pension

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes** ( )**No** ( )

If so, the Bidder must provide the following information, for all FPSs in receipt of a pension, as applicable:

a. name of former public servant;

b. date of termination of employment or retirement from the Public Service.

By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

Work Force Adjustment Directive

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of the Work Force Adjustment Directive? **Yes** ( )**No** ( )

If so, the Bidder must provide the following information:

a. name of former public servant;

b. conditions of the lump sum payment incentive;

c. date of termination of employment;

d. amount of lump sum payment;

e. rate of pay on which lump sum payment is based;

f. period of lump sum payment including start date, end date and number of weeks;

g. number and amount (professional fees) of other contracts subject to the restrictions of a work force adjustment program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is $5,000, including Applicable Taxes.

2.5 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 question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated and the enquiry can be answered to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

2.6 Applicable Laws

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

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

2.7 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 fifteen (15) days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

2.8 Bidders' Conference

A bidders' conference will be held at 6767 Route de l’Aéroport, St-Hubert, Qc, J3Y 8Y9 on December 3rd, 2014. The conference will begin at 1 O’clock EST. The scope of the requirement outlined in the bid solicitation will be reviewed during the conference and questions will be answered. It is recommended that bidders who intend to submit a bid attend or send a representative.

Bidders are requested to communicate with the Contracting Authority before the conference to confirm attendance. Bidders should provide, in writing, to the Contracting Authority, the name(s) of the person(s) who will be attending and a list of issues they wish to table no later than December 1st, 2014 at 10:00 AM EST.

Any clarifications or changes to the bid solicitation resulting from the bidders' conference will be included as an amendment to the bid solicitation. Bidders who do not attend will not be precluded from submitting a bid.

2.9 Basis for Canada's Ownership of Intellectual Property

The Canadian Space Agency has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada, on the following grounds:

6.2 - statutes, regulations or previous obligations of Canada to a third party or parties preclude contractor ownership of the Intellectual Property Rights in Foreground Information;

6.4.2 - the main purpose of the contract, or of the deliverables contracted for, is to augment an existing body of Canada's background information as a prerequisite to the transfer of the augmented background to the private sector, through licensing or assignment of ownership (not necessarily to the original contractor), for the purposes of commercial exploitation.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

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

Section I: Technical Bid (Two (2) hard copies and two (2) soft copies on CD or DVD.)

Section II: Financial Bid (One (1) hard copy)

Section III: Certifications (One (1) hard copy)

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

(b) For the hard copies, each section must be bound separately;

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

(d) For the soft copies of Section I (Technical and Managerial as well as the Executive Summary), all of the information must be contained in one file. The only acceptable formats are: MS Word and PDF;

(e) For the soft copy of Section II (Financial Bid), all of the information must be contained in one file. The only acceptable formats are: MS Word and PDF;

(f) The soft copy of Section II must be submitted on a separate CD or DVD than the soft copy submitted for Section I;

(g) The bid should 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. To assist Canada in reaching its objectives, bidders should:

1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and 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 and Managerial Bid

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

The Technical and Managerial 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.

Part 4, Evaluation Procedures and Basis of Selection contains additional instructions that bidders should consider when preparing their technical Bid.

The structure and content requested for the Technical and Managerial Bid (Section I) are detailed in Attachment 1 to Part 3: Technical and Managerial Bid Preparation Instructions.

Section II: Financial Bid

Bidders must submit their financial bid in accordance with the Basis of Payment in Annex B.

The total amount of Applicable Taxes must be shown separately.

3.1.1 Price Breakdown

Bidders are requested to detail the following elements for the performance, each phase of the Work including the options, broken per Annex B.

(a) **Labour:** For each individual and (or) labour category to be assigned to the Work, indicate: i) the hourly rate, inclusive of overhead and profit; and ii) the estimated number of hours.

(b) **Equipment**: Specify each item required to complete the Work and provide the pricing basis of each one, Canadian customs duty and excise taxes included, as applicable.

(c) **Materials and Supplies**: Identify each category of materials and supplies required to complete the Work and provide the pricing basis.

(d) **Travel and Living Expenses**: Indicate the number of trips and the number of days for each trip, the cost, destination and purpose of each trip, together with the basis of these costs which must not exceed the limits of the Treasury Board (TB) Travel Directive. With respect to the TB Directive, only the meal, private vehicle and incidental allowances specified in Appendices B, C and D of the Directive, and the other provisions of the Directive referring to "travellers", rather than those referring to "employees", are applicable. The Treasury Board Secretariat's Special Travel Authorities, also apply.

(e) **Subcontracts:** Identify any proposed subcontractor and provide for each one the same price breakdown information as contained in this article.

(f) **Other Direct Charges**: Identify any other direct charges anticipated, such as long distance communications and rentals, and provide the pricing basis.

(g) **Applicable Taxes:** Identify any Applicable Taxes separately.

3.1.2 Exchange Rate Fluctuation

C3011T (2013-11-06), Exchange Rate Fluctuation

Section III: Certifications

Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 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.

4.1.1 Technical and Management Evaluation

4.1.1.1 Mandatory and Point Rated Technical and Management Evaluation Criteria

Mandatory and point rated technical evaluation criteria are included in Attachment 1 to Part 4.

4.1.2 Financial Evaluation

4.1.2.1 Evaluation of Price

The price of the bid will be evaluated in Canadian dollars, Applicable Taxes excluded, Canadian customs duties and excise taxes included.

4.2 Basis of Selection

1. To be declared responsive, a bid must:
    a. comply with all the requirements of the bid solicitation; and
    b. meet all mandatory criteria; and
    c. Obtain the required minimum points specified for each rated criterion for technical evaluation.
2. Bids not meeting (a) or (b) or (c) will be declared non-responsive.
3. The responsive bid with the lowest evaluated price* will be recommended for award of a contract.

*Lowest evaluated price will be equal to the Total of Phase B, C, and D for five cameras (Including Long Lead items for 5 cameras)
(Lowest evaluated price = B1 + B2 + O4A + O1B + O2B + O3B + O4B (items from Annex B – Basis of payment))

In the event the lowest cost between two or more bidders is identical, the contract will be awarded to the bidder with the highest rated score for all Rated Criteria.

PART 5 - CERTIFICATIONS

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

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

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

5.1 Certifications Required Precedent to Contract Award

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

5.1.1 Integrity Provisions - Associated Information

By submitting a bid, the Bidder certifies that the Bidder and its Affiliates are in compliance with the provisions as stated in Section 01 Integrity Provisions - Bid of Standard Instructions 2003. The associated information required within the Integrity Provisions will assist Canada in confirming that the certifications are true.

5.1.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available from Employment and Social Development Canada (ESDC) - Labour's website.

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

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

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

5.2 Additional Certifications Required Precedent to Contract Award

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

5.2.1 Canadian Content Certification

This procurement is limited to Canadian goods and Canadian services.

The Bidder certifies that:

( ) a minimum of 80 percent of the total bid price consist of Canadian goods and Canadian services as defined in paragraph 5 of clause A3050T.

For more information on how to determine the Canadian content for a mix of goods, a mix of services or a mix of goods and services, consult Annex 3.6.(9), Example 2, of the *Supply Manual*.

SACC Manual clause

A3050T (2010-01-11) Canadian Content Definition.

5.2.2 Status and Availability of Resources

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

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

5.2.3 Education and Experience

The Bidder certifies that all the information provided in the résumés and supporting material submitted with its bid, particularly the information pertaining to education, achievements, experience and work history, has been verified by the Bidder to be true and accurate. Furthermore, the Bidder warrants that every individual proposed by the Bidder for the requirement is capable of performing the Work described in the resulting contract.

5.2.4 Language Capability

The Bidder certifies that it has the language capability required to perform the Work, as stipulated in the Statement of Work.

5.2.5 Subcontractors

The Bidder must submit the name of its main* subcontractors that will support the execution of the project and demonstrate their agreement to do so. There is no requirement to report the purchase of off-the-shelf items and software and such standard articles and manufacturers in the normal course of business ordinarily produce materials or the provision of such incidental services as might ordinarily be subcontracted in performing the Work.

The Bidder must provide, for each subcontractor, the following:

a) The name of the subcontractor: complete name of its legal entity and place of incorporation
b) The subcontractor contact: name, title, telephone and fax numbers
c) A description of the roles and responsibilities of the subcontractor and/or material to be purchased from that contractor;
d) A document signed by the subcontractor indicating its agreement to undertake the work as described in the Bidder's proposal.

* Per modified paragraph 6 of General Conditions 2040 (2014-09-25) stated in Section 3.1 of Part 7.

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

6.1 Security Requirement

1. Before award of a contract, the following conditions must be met:

   (a) the Bidder must hold a valid organization security clearance as indicated in Part 7 - Resulting Contract Clauses;

   (b) the Bidder's proposed individuals requiring access to classified or protected information, assets or sensitive work site(s) must meet the security requirement as indicated in Part 7 - Resulting Contract Clauses;

   (c) the Bidder must provide the name of all individuals who will require access to classified or protected information, assets or sensitive work sites;

   (d) the Bidder's proposed location of work performance or document safeguarding must meet the security requirement as indicated in Part 7 - Resulting Contract Clauses;

   (e) the Bidder must provide the address(es) of proposed location(s) of work performance or document safeguarding as indicated in Part 3 - Section IV Additional Information.

2. Bidders are reminded to obtain the required security clearance promptly. Any delay in the award of a contract to allow the successful bidder to obtain the required clearance will be at the entire discretion of the Contracting Authority.

3. For additional information on security requirements, bidders should refer to the Canadian Industrial Security Directorate (CISD), Industrial Security Program of Public Works and Government Services Canada website.

6.2 Financial Capability

Manual SACC clause A9033T (2012-07-16) Financial Capability

6.3 Controlled Goods Requirement

SACC Manual clause A9130T (2014-06-26) 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. Statement of Work

The Contractor must perform the Work in accordance with the Statement of Work at Annex A and the Contractor's technical and managerial bid entitled _____, dated _____. (*Will be inserted at contract award)*

2. Optional Goods and/or Services

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Annexes A and B, Statement of Work of the Contract, under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The Contracting Authority may exercise the options within a period between Contract award and 6 months following the CDR approval by sending a written notice to the Contractor.

3. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* issued by Public Works and Government Services Canada.

3.1 General Conditions

The general conditions **2040 (2014-09-25), General Conditions - Research & Development,** as modified below apply to and form part of the Contract.

Section 6 of General Conditions 2040 entitled “Subcontracting” is deleted and replaced by the following:

1. Except as provided in subsection 2 and unless otherwise provided in the Contract, the Contractor must obtain the Contracting Authority's written consent before subcontracting or permitting the subcontracting of any part of the Work. For Work or any part of the Work related to Optics, Image sensors, light assemblies, FPGA programming, telemetry and NASA safety requirements for ISS, the Contractor must always obtain the Contracting Authority’s written consent, notwithstanding the value of such subcontract(s). For greater certainty, the exceptions at subsection 2 do not apply to Work related to Optics, Image sensors, light assemblies, FPGA programming, telemetry and NASA safety requirements for ISS. A subcontract includes a contract entered into by any subcontractor at any tier to perform any part of the Work.

2. The Contractor is not required to obtain consent for subcontracts specifically authorized in the Contract. The Contractor may also without the consent of the Contracting Authority:

a. purchase "off-the-shelf" items and any standard articles and materials that are ordinarily produced by manufacturers in the normal course of business;

b. subcontract any incidental services that would ordinarily be subcontracted in performing the Work;

c. in addition to purchases and services referred to in paragraphs (a) and (b), subcontract any part or parts of the Work to one or more subcontractors up to a total value of $500 000 per subcontract; and

d. permit its subcontractors at any tier to make purchases or subcontract as permitted in paragraphs (a), (b) and (c).

3. In any subcontract other than a subcontract referred to in paragraph 2.(a), the Contractor must, unless the Contracting Authority agrees in writing, ensure that the subcontractor is bound by conditions compatible with and, in the opinion of the Contracting Authority, not less favorable to Canada than the conditions of the Contract, with the exception of requirements under the Federal Contractors Program for employment equity which only apply to the Contractor.

4. Even if Canada consents to a subcontract, the Contractor is responsible for performing the Contract and Canada is not responsible to any subcontractor. The Contractor is responsible for any matters or things done or provided by any subcontractor under the Contract and for paying any subcontractors for any part of the Work they perform.

3.2 Supplemental General Conditions

The following supplemental general conditions apply to and form part of the Contract:

K3410C (2008-12-12), Canada to Own Intellectual Property Rights in Foreground Information
4001 (2013-01-28), Hardware Purchase, Lease and Maintenance
4002 (2010-08-16), Software Development or Modification Services
4003 (2010-08-16), Licensed Software

3.3 Non-disclosure Agreement

The Contractor must obtain from its employee(s) or subcontractor(s) the completed and signed non-disclosure agreement, attached at Annex D, and provide it to the Contracting Authority before they are given access to information by or on behalf of Canada in connection with the Work.

4. Security Requirement

1. The Contractor/Offeror must, at all times during the performance of the Contract/Standing Offer, hold a valid **Designated Organization Screening (DOS) with approved Document Safeguarding at the level of PROTECTED B,** issued by the Canadian Industrial Security Directorate, Public Works and Government Services Canada.

2. The Contractor/Offeror personnel requiring access to PROTECTED information, assets or work site(s) **must EACH hold a valid RELIABILITY STATUS**, granted or approved by the Canadian Industrial Security Directorate (CISD), Public Works and Government Services Canada (PWGSC).

   Until the security screening of the Sub-Contractor personnel required by this Sub-Contract has been completed satisfactorily by the CISD, PWGSC, the Sub-Contractor personnel **MAY NOT HAVE ACCESS** to **CLASSIFIED** information or assets, and **MAY NOT ENTER** sites where such information or assets are kept, without **an escort.**

3. This contract includes access to **controlled goods.** Prior to access, the contractor must be registered in the Controlled Goods Program of Public Works and Government Services Canada.

4. The Contractor **MUST NOT** utilize its **Information Technology** systems to electronically process, produce or store PROTECTED information until the CISD/PWGSC has issued written approval. After approval has been granted or approved, these tasks may be performed at the level of **PROTECTED B**.

5. Subcontracts which contain security requirements are **NOT** to be awarded without the prior written permission of CISD/PWGSC.

6. The Contractor/Offeror must comply with the provisions of the:

   (a) Security Requirements Check List and security guide (if applicable), attached at Annex _____;
   (b) Industrial Security Manual (Latest Edition)

5. Term of Contract
5.1 Period of the Contract

The contract issued will be for a period of 15 months for Phase B and C and with an optional Phase D of 13 months.

6. Authorities
6.1 Contracting Authority

The Contracting Authority for the Contract is:

Jessie Jutras
Supply Specialist
Public Works and Government Services
Canada Space Programs Directorate
6767, Route de l'Aéroport
St-Hubert, QC, Canada J3Y 8Y9

Telephone: 450-926-6670
E-mail address: jessie.jutras@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.

6.2 Project Authority

The Project Authority for the Contract is:

Name:
Title:
Organization:
Address:

Telephone:
Facsimile:
E-mail:

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.

6.3 Contractor's Representative

The Contractor's Representative for the Contract is:

Name:
Title:
Organization:
Address:

Telephone:
Facsimile:
E-mail:

7. Proactive Disclosure of Contracts with Former Public Servants

SACC Manual Clause A3025C (2013-03-21)

8. Payment

8.1 Basis of Payment - Firm Price

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price, as specified in the Contract for a cost of $ _____ *(the amount will be inserted at contract award).* Customs duties are included and Applicable taxes are extra, if applicable.

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.

8.2 Method of Payment
8.2.1 Milestone Payments

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

(a) an accurate and complete claim for payment using form PWGSC-TPSGC 1111 and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;

(b) all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;

(c) all work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.

8.2.2 Schedule of Milestones

The schedule of milestones for which payments will be made in accordance with the Contract is detailed in Annex B – Basis of payments.

8.2.3 SACC Manual Clauses

A9117C (2007-11-30), T1204 - Direct Request by Customer Department
C0705C (2010-01-11), Discretionary Audit

9. Invoicing Instructions
9.1 Invoicing Instructions - Progress Claim - Firm Price

1. The Contractor must submit a claim for progress payment using form PWGSC-TPSGC 1111.

   Each claim must show:

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

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

3. The Contractor must prepare and certify **one (1) original and two (2) copies** of the claim on form PWGSC-TPSGC 1111, **forward:**

   a) the **original and one (1) copy** to the Canadian Space Agency at the address shown on page 1 of the Contract under "Invoices" (Financial Services Section) for appropriate certification by the Project Authority identified herein after inspection and acceptance of the Work takes place;

   and,

   b) **one (1) copy of the original** progress claim to the Contracting Authority identified under the section entitled “Authorities” of the Contract.

4. The CSA's Financial Services Section will then forward the original and one (1) copy of the claim to the Contracting Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

5. The Contractor must not submit claims until all work identified in the claim is completed.

10. Certifications

10.1 Compliance

The continuous compliance with the certifications provided by the Contractor in its bid and the ongoing cooperation in providing associated information are conditions of the Contract. Certifications are subject to verification by Canada during the entire period of the Contract. If the Contractor does not comply with any certification, fails to provide the associated information, or if 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.

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

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

10.3 SACC Manual Clauses

A3060C (2008-05-12), Canadian Content Certification

11. Applicable Laws

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

12. Priority of Documents

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

(a) The Articles of Agreement;
(b) The supplemental general conditions K3410C (2008-12-12, Canada to Own Intellectual Property Rights in Foreground Information 4001 (2013-01-28), Hardware Purchase, Lease and Maintenance; 4002 (2010-08-16), Software Development or Modification Services; 4003 (2010-08-16), Licensed Software
(c) The general conditions 2040 (2014-09-25) General Conditions - Research & Development modified above;
(d) Annex A, Statement of Work
(e) Annex B, Basis of Payment;
(f) Annex C, Security Requirements Check List;
(g) Annex D, Non-disclosure Agreement;
(h) Annex E, Disclosure Certification;
(i) The Contractor's bid dated _____.

13. Foreign Nationals (Canadian Contractor)

SACC Manual clause A2000C (2006-06-16) Foreign Nationals (Canadian Contractor)

14. Insurance

SACC Manual clause G1005C (2008-05-12) Insurance

15. Controlled Goods Program

SACC Manual clause A9131C (2014-06-26) Controlled Goods Program

16. Disclosure certification

On completion of the Work, the Contractor must submit to the Project Authority and to the Contracting Authority a copy of the Disclosure Certification attached as Annex E stating that all applicable disclosures were submitted or that there were no disclosures to submit under General conditions 2040 (2014-06-26) article 28 - Research and Development.

17. Directive on Communications with the Media

1. Definitions

“Communication Activity(ies)” includes: public information and recognition, the planning, development, production and delivery or publication, and any other type or form of dissemination of marketing, promotional or information activities, initiatives, reports, summaries or other products or materials, whether in print or electronic format that pertain to the present agreement, all communications, public relations events, press releases, social media releases, or any other communication directed to the general public in whatever form or media it may be in, including but without limiting the generality of the preceding done through any company web site.

2. Communication Activities Format

The Contractor must coordinate with the Canadian Space Agency (CSA) all Communication Activities that pertain to the present contract.

Subject to review and approval by the CSA, the Contractor may mention and/or indicate visually, without any additional costs to the CSA, the CSA's participation in the contract through one or both of the following methods at the complete discretion of the CSA:

a. By clearly and prominently labelling publications, advertising and promotional products and any form of material and products sponsored or funded by the CSA, as follows, in the appropriate official language:

"This program/project/activity is undertaken with the financial support of the Canadian Space Agency."

"Ce programme/projet/activité est réalisé(e) avec l'appui financier de l'Agence spatiale canadienne."

b. By affixing CSA's corporate logo on print or electronic publications, advertising and promotional products and on any other form of material, products or displays sponsored or funded by the Canadian Space Agency.

The Contractor must obtain and use a high resolution printed or electronic copy of the CSA's corporate identity logo and seek advice on its application, by contacting the Project Authority, as mentioned in section 7.6.2 of this contract.

3. Communication Activity Coordination Process

The contractor must coordinate with the CSA's Directorate of Communications and Public Affairs all Communication Activities pertaining to the present contract. To this end, the contractor must:

a. As soon as the Contractor intends to perform a Communication Activity, send a Notice to the CSA's Directorate of Communications and Public Affairs. The Communications Notice must include a complete description of the proposed Communication Activity. The Notice must be in writing in accordance with Article 44 of the General Conditions 2040 contract titled Notice. The Communications Notice must include a copy or example of the proposed Communication Activity.

b. The contractor must provide to the CSA any and all additional document in any appropriate format, example or information that the CSA deems necessary, at its entire discretion to correctly and efficiently coordinate the proposed Communication Activity. The Contractor agrees to only proceed with the proposed Communication Activity after receiving a written confirmation of coordination of the Communication Activity from the CSA's Directorate of Communications and Public Affairs.

c. Should the Contractor proceed with the Communication Activity without having previously received the written confirmation of coordination from the CSA's Directorate of Communications and Public Affairs, subject to giving Notice to the Contractor, Canada is entitled to exercise its right under section 155 of the *Financial Administration Act* and retain from payment to the Contractor or recover from the Contractor the amount of damages that may be due to Canada as a result of the release of information by the Contractor.

ANNEX “A”

STATEMENT OF WORK

CSA-RCAM-SOW-0001

Canadian Space Agency

MSS Replacement Cameras & Lights
Statement of Work (SOW)

Initial Release

Date: 6 November 2014

NCAGE Code: L0889

Canadian Space Agency | Agence Spatiale Canadienne

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APPROVALS

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Reviewed by:			7 nov 2014
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Reviewed by:			NOV 7, 2014
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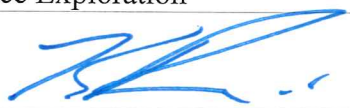
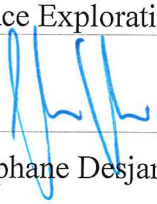
Approved by:			NOV 0 6 2014
	Ken Podwalski Manager (Logistics and Sustaining Engineering) Space Exploration		Date
Approved by:			7 nov. 2014
	Stéphane Desjardins Manager, Projects/Programs Portfolio Space Exploration		Date

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REVISION HISTORY

Rev.	Description	Initials	Date
IR	Initial Release	GB	6 November

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1 INTRODUCTION

1.1 PURPOSE

The Canadian Space Agency (CSA) is planning to provide replacement Cameras & Lights to the Mobile Servicing System (MSS). This Statement of Work defines the work for Phases B, C and, as option, Phase D of this project. The scope of this Statement of Work (SOW) encompasses the design, and option for development, production, assembly and test of replacement Cameras & Lights.

1.2 BACKGROUND

The CSA is responsible for the Mobile Servicing System (MSS) which was used to assemble the International Space Station (ISS) on-orbit. As part of its sustaining operations and ISS inspection Tasks, the MSS is now playing a key role in the logistics, maintenance and inspection of the ISS, Free Flyer and/or Visiting Vehicle robotic capture, installation, removal and operation of science and technical demonstrations existing and planned for the ISS.

The MSS consists of three robotics systems commonly known as Dextre, Canadarm2 and the Mobile Base System, and is equipped with nine (9) color TV cameras as part of Camera, Light Assemblies (CLAs) or Camera, Light Pan/Tilt Assemblies (CLPAs) which aid the robotic controllers in achieving their tasks. CLAs & CLPA are On-Orbit Replaceable Units (ORUs). These ORUs have been on-orbit for approximately ten (10) years, which is the life for which they have been designed. With the life extension of the ISS to year 2020, the available CLA/CLPA spare parts and the present failure rate of the current camera & lights, there is a requirement to initiate the procurement of new components.

This SOW defines the work required to procure Shop Replaceable Units (SRUs). The new cameras and lights (C&L) must be installed on existing CLA and CLPA as replacement components to existing cameras & lights.

1.3 ROLES AND RESPONSIBILITIES

Table 1-1 summarizes the roles and responsibilities of the main organizations related to this SOW.

TABLE 1-1 – ROLES AND RESPONSIBILITIES

Organization	Role	Responsibility
CSA RCAM Project Team	Cameras & Lights contract management Liaise between CSA RCAM and CSA L&SE organizations	Management of cameras & lights procurement Management of the RCAM project. Ensuring deliverables meet customer needs.
CSA L&SE Group	Customer of MSS RCAM project Management of Integration Work Packages. Representative to ISS/NASA	To verify that the work is done per task order requirements; Authority to accept/reject task order work and deliverables.
RCAM Contractor (referred to as Contractor in the remainder of this document)	Camera & Light contractor	Under contract to CSA to design, and under option to build, test, deliver cameras & lights.
L&SE Contractor (MDA) (referred to as Integrator in the remainder of this document)	ORU integrator Support milestone reviews Integration characterization of the Engineering Qualification Model	Under task order with CSA to ensure camera/light can be integrated into ORU's, to demonstrate and support acceptance of integration of cameras/lights to MSS

1.4 ASSUMPTIONS

The Contractor must assume:

1. No Government Furnished Equipment. Any ground test equipment, MSS Crown Inventory, or other equipment related to the existing cameras are used to support the operational requirements of the MSS logistics and sustaining engineering of the on-orbit system and as such are not available for support to the activities in this Statement of Work. However, the MSS camera lens cover, part number (P/N) 51612-4968-551 will be available to support fit-check activities.

1.5 GUIDING DEFINITIONS

- Engineering Qualification Model (EQM):
    - fully representative of the Flight Model except that a lower standard of electrical components may be used. The standard of these components must be the highest

achievable within the schedule constraints but using the same manufacturer, the same type and the same package as for the Flight Model. Only the testing and the screening of the parts might be different compared to the Flight Model.

- Flight Model (FM):
  - a flight end item on which an acceptance test campaign is performed before flight. The FM is built to fully flight standard in accordance with PA and CADM requirements. Flight standard parts must be used.

1.6 DOCUMENT CONVENTIONS

A number of the sections in this document describe controlled requirements and specifications and therefore the following verbs are used in the specific sense indicated below:

a) "Must" or "Required" is used to indicate a contractual obligation;

b) "Should" indicates a preferred alternative but is not a contractual obligation under the contract;

c) "May" indicates an option;

d) "Will" indicates a statement of intention or fact, as does the use of present indicative active verbs.

2 DOCUMENTS

2.1 APPLICABLE DOCUMENTS

The documents of the exact issue date and revision shown in Table 2-1 are applicable and form an integral part of this Statement of Work to the extent specified herein and will be provided upon request. For simplicity, sub-documents are not listed but applicable and will also be provided upon request. Revision levels shown are at the time of writing this document, and may be revised later by agreement with the Project Manager (PM).

TABLE 2-1 – APPLICABLE DOCUMENTS LIST

AD #	Document Number	Title	Revision	Issue Date
AD-01	CSA-SS-SG-0061	System specification for Mobile Servicing System (MSS) Replacement Camera (RCAM)	IR	Mar 10, 2014
AD-02	CSA-RCAM-RD-0001	MSS Replacement Camera Product assurance Requirements (PAR)	IR	Feb 13, 2014

2.2 REFERENCE DOCUMENTS

The following documents provide additional information or guidelines that either may clarify the contents or are pertinent to the history of this document.

TABLE 2-2 – REFERENCE DOCUMENTS LIST

RD #	Document Number	Title	Revision	Issue Date
RD-01	CSA-SE-PR-0001	Systems Engineering Methods and Practices	B	March 10, 2010
RD-02	CSA-SE-STD-0001	CSA Technical Reviews Standard	A	November 7 2008
RD-03	CSA-ST-GDL-0001	Technology Readiness and Risk Assessment Guidelines	B	February 14, 2014

3 WORK REQUIREMENTS

3.1 PROJECT MANAGEMENT

The Contractor must provide, either directly or through subcontracts, all facilities, personnel, equipment, materials and services necessary to perform the work specified in this SOW.

The Contractor must manage the project to effectively achieve project technical, scope, quality, cost and schedule requirements of this SOW.

The Contractor must provide the management, technical leadership, and support necessary to ensure effective and efficient performance of all project efforts and activities. The Contractor must dedicate experienced personnel to the project in all the disciplines required to carry out the work.

The Contractor personnel must establish and maintain a close management and technical interface with the Project Manager (PM) to assure a coordinated program effort to meet or exceed the project objectives.

The Contractor must include, within its program management structure, the necessary leadership to effectively manage the performance of subcontractors in keeping with the project objectives.

3.1.1 Project Management Control

The Contractor must develop and implement the Project Management Plan (PMP), as per CDRL PM-01 (see CDRL list in Appendix B).

The Phase B/C/D WBS and project schedule must be updated to reflect initial contract agreement and must be presented by the Contractor at the KOM, and subsequently updated as per CDRLs PM-02 and PM-03.

The Contractor must establish and maintain a project management control system to effectively integrate the approved scope of work with the schedule, budget, quality and potential risk issues, maintain all project status data, and provide visibility and assurance to the PM that the project is on schedule and that it is meeting contract and performance requirements.

The management control system must track, control and report project schedule and deviations to the schedule, as well as technical, performance and risk issues through the Monthly Progress Report as per CDRL PM-04.

3.1.2 Project Team Organization

The Contractor must produce and maintain a project organization. The Contractor must provide and maintain a current Project Organizational Chart, showing personnel assignments by name and function and showing Subcontractor reporting relationships.

The Contractor must nominate a Project Manager, who will be responsible for all aspects of the work carried out by the Contractor. The Project Manager must possess all the qualifications and experience needed to lead the Contractor's work throughout the duration of the contract. The Contractor's Project Manager must have full access to the Contractor's senior management for timely resolution of all issues affecting the project.

The Contractor must identify other key personnel who are considered essential to the execution of the contract. The Contractor must assign personnel with appropriate qualifications and experience to all posts within the project organization.

The Contractor must provide in the Monthly Progress Report (CDRL PM-04) any variation in key personnel assignments by name and function. Replacement of personnel identified as key personnel must be approved by the PM and the Contracting Authority.

3.1.3 Work Breakdown Structure

The project must be planned, controlled and directed by the Contractor using a Work Breakdown Structure (WBS) that organises and defines the total work scope of the project, based on the Product Tree (CDRL SE-02).

The Contractor must update and deliver the WBS as per CDRL PM-02.

The Contractor must establish and maintain a WBS Dictionary (per CDRL PM-02) defining the work to be done against each WBS element identified in the WBS by means of a Work Package Description (WPD) for each such element. Updates to the WBS Dictionary must be provided along with the WBS updates by the Contractor as per CDRL PM-02.

3.1.4 Project Schedule

The Contractor must prepare a detailed schedule based on the WBS. This schedule must identify tasks, task durations, dependencies between tasks, and the critical path. The Contractor must deliver with the Monthly Progress Report, the project schedule in native format as per CDRL PM-03. A Gantt chart figure must be included in the monthly report. Table 3-1 shows a proposed project milestones schedule.

TABLE 3-1 – PROPOSED PROJECT MILESTONES SCHEDULE

Phase B: Preliminary Design	
KOM	Contract Award + 2 weeks
IDR (Interface Design Review)	Contract Award + 3 months
Unit PDR (Preliminary Design Review)	Contract Award + 8 months
Phase C: Detailed Design	
Unit CDR (Cameras and Lights)	Contract Award + 15 months
Phase D: Flight Model Build and Delivery (Option)	
Flight Model Delivery to CSA*	Contract Award + 28 months

*The Contractor must deliver the Flight Models within the required timeframe.

3.1.5 Risk Management

The Contractor must establish and maintain a comprehensive risk management program. Risks and mitigation analyses must include risks to the camera performance, reliability, schedule, and safety. The Contractor must identify and implement risk reduction/resolution activities. The Contractor must assess and report the status of each risk element in the Monthly Progress Report (CDRL PM-04), during progress reviews, and at each formal technical review.

3.1.6 Project Management Reporting

The Contractor must write and deliver monthly reports as per CDRL PM-04. Monthly reports must identify decisions taken during the reporting period resulting in schedule changes. The reports must summarize the work accomplished during the past month and briefly mention the tasks planned for the coming month. The reports must also summarize the progress of the previous month's planned work and explain any changes. The reports must present an updated milestones schedule tables with rationale for any schedule changes.

3.1.6.1 Final Report

The Contractor must produce and deliver a final report as close out to the project, per CDRL-PM-11. The Final Report must encompass all the work done for the entire project. It must be a comprehensive summary of the project work with the emphasis on the problems encountered, solutions implemented, successes encountered and lessons learned. The Contractor must hold a Final Review (FR) at end of the project.

3.1.7 Action Item Log

The Contractor must maintain a detailed Action Item Log (AIL) throughout the project to track actions resulting from design reviews, status reviews, Web- or teleconferences as per CDRL PM-05. The AIL must be delivered, in MS Office Excel or Word format, each month. The AIL is not included in the monthly report (CDRL PM-04).

3.1.8 Project Reviews and Meetings

The Contractor is responsible for providing agendas and minutes of all pertinent meetings held between the Contractor and CSA as per CDRL PM-06 & CDRL PM-07. To all reviews and meetings in this SOW, the Contractor must provide access to CSA personnel and third parties identified by CSA, for example, NASA, the Integrator, and representatives from other government departments that CSA may identify. Minutes will primarily report decisions and action items. The following meetings are planned for this project.

3.1.8.1 Kick Off Meeting

The Contractor must hold a Kickoff Meeting (KOM) at the CSA's facility (CDRL-PM-09). This meeting will serve to introduce key team members and will review the updated management plans initially provided with the proposal, the requirements of the work, schedules, deliverables and risks. Any contractual and any other outstanding issues must be addressed at the KOM. Further, the Kick Off Meeting will serve to validate the system requirements and the project readiness to proceed with preliminary design. All key participants under the contract must attend.

3.1.8.2 Monthly Progress Review Meetings

The Contractor must hold monthly progress reviews at its facilities or by Web-conference, as agreed with the PM. The Monthly Progress Review presentations must be based on the most recent Progress Reporting and must review technical progress, significant technical issues, schedule, deliverables, quality assurance activities, risks and Action Items Log (AIL), and must address contractual and any other outstanding issues. The monthly progress presentation is delivered at the meeting to CSA.

The requirement for a Monthly Progress Review will be waived when it coincides with the month of a Technical Review, including the Monthly Progress Presentation.

3.1.8.3 Weekly Teleconference Meetings

The Contractor must hold weekly teleconference meetings with PM, and the duration should be limited to one hour. The weekly teleconference is mainly to address technical issues and to discuss progress. The contractor must prepare a weekly agenda with a list of points to be discussed and the agenda is distributed by email to the team in Contractor format. The contractor must prepare a summary of the weekly teleconference and the summary is distributed to the project team in Contractor format.

3.1.8.4 Formal Technical Reviews

The Contractor must conduct the formal technical reviews listed in the SOW, in the manner and sequence described in RD-02.

The purpose of each of these reviews is provided in dedicated subsections of this SOW.

The Contractor must use the common Entry and Exit Criteria contained in the CSA Technical Reviews Standard (RD-02), in the conduct of these reviews, as well as the Entry and Exit Criteria specific to each review.

In addition, the Contractor must notify CSA of their subcontractor reviews, within a minimum of seven (7) business days notice, and invite CSA to those reviews.

3.1.8.5 Ad-Hoc Meetings

The Contractor may request Ad-hoc Meetings with the PM whenever required to resolve unforeseen and urgent issues. The selection of participants will depend on the nature of the issue.

The PM may also request such Ad-hoc Meetings with the Contractor, in which the Contractor must participate.

3.1.8.6 Ad-Hoc Support to ORU Integration

For Ad-hoc meetings related to integration (including, but not limited to, ORU related reviews, NASA boards and panels), other than already provided for in previous sections, for costing purposes, the Contractor must assume 50 hours. These Ad-hoc meetings are on CSA request only.

3.1.9 Document Deliverables

The Contractor must prepare and deliver the documents as requested in the Contract Data Requirements List (CDRL) in Appendix B, and in accordance with the relevant DIDs in Appendix C.

Documents submitted by the Contractor will be approved or reviewed in accordance with the Approval Category of each deliverable.

The English language must be used throughout.

Imperial units must be used in the documentation and System International (SI) units should be supplied as reference.

The delivery schedule for all documentation is defined in Appendix B. Where two or more deliveries of the same document are called, the subsequent delivery may be satisfied by a statement indicating that the previous issue of the document still applies (referenced by title, document number and issue), if this is the case.

The Contractor must obtain approval from the PM as per the document approval procedures below for all CDRL documents listed in Appendix B and marked as Approval Category "A".

3.1.9.1 Document Deliverables, Format and Content

Documents requested in this SOW must be provided with the format and content specified in the relevant CDRL/DID. All documents must comply with the Deliverable Document and Data Requirements specified in DID-000 of Appendix C.

3.1.9.2 Documents Delivered for Approval

The term "Approval", as used in this document and in other documents referred to herein, means written approval by the PM, of documents submitted by the Contractor. Once approved, the document is authorized for further use by the CSA. The CSA does not take responsibility for the validity of the data, or statements, and the Contractor is fully responsible for the content and secondary effects derived there from. The document may not be changed without the PM's approval. No request or document for which approval is required may be acted upon or implemented by the Contractor until such approval is provided. Such requests and documents will be reviewed promptly by the PM and the necessary written approval or disapproval will be provided after their receipt by CSA. In the event of a failure by the PM to approve or disapprove the document within fifteen (15) working days, the documents may be deemed approved.

In the event that a request or document is disapproved, the PM will advise the Contractor in writing as to the reasons for such disapproval and will define the additions, deletions or corrections that the PM deems necessary to render the request or document acceptable. Disapproved requests or documents that are subsequently amended by the Contractor and resubmitted for approval will be either approved or disapproved by the PM. Approval or disapproval of resubmitted requests or documents will be based solely on those points that were not previously deemed to be acceptable.

3.1.9.3 Documents Delivered for Review

The term "Review" as used in this document and in all other documents referred to herein means, unless specifically stated otherwise, a CSA review of the documents submitted for that purpose by the Contractor. The acceptance by the PM of a document for review implies that the document has been reviewed, commented on, revised as necessary, and has been determined to meet the requirements. The CSA does not take responsibility for the validity of the data or statements, and the Contractor is fully responsible for the content and secondary effects derived there from. In the event that the PM does not concur with a document submitted for review, the PM will so notify the Contractor within fifteen (15) working days of the document submission. Such notification will include a full explanation of the reasons for the lack of concurrence and will recommend the additions, deletions and/or corrections, which the PM deems are beneficial to the project.

The Contractor is obligated to consider implementation of the changes suggested by CSA insofar as the changes are in accordance with the relevant DID and this SOW. If written notification of concurrence is not provided by the TA within fifteen (15) working days of the receipt of the document, the document must be deemed to have been reviewed and accepted by the PM without comment.

3.1.9.4 Technical Notes

The Contractor must prepare engineering reports or documents in the form of informal Technical Notes (TNs) that are required to address and resolve individual technical problems that occur during the contract. The purpose of these Technical Notes is to document and exchange technical information on the progress of work. Copies of all Technical Notes dealing with significant technical or quality issues must be delivered to the PM for review, in accordance with CDRL-SE-05.

3.1.10 Intellectual Property

The Contractor must explicitly define the Foreground Intellectual Property (FIP) generated during the execution of the contract and report this in the IP Disclosure Report (CDRL PM-08). This document must also identify the Background Intellectual Property (BIP) that is required to use the FIP.

All Intellectual Property (IP) which needs to be described in documents or presented at technical reviews must be available to the CSA and third parties for the purpose of this work. The Contractor must identify the need for NDA's and must be responsible for putting those NDA's in place in time for the respective reviews.

All documents containing proprietary information must identify this on the front cover and on each page per DID-000 of Appendix C.

3.2 SAFETY & MISSION ASSURANCE

3.2.1 Quality Assurance System

The Contractor must have in place and maintain throughout execution of the work a Quality Assurance (QA) System compliant to ISO 9001.

3.2.2 Product Assurance Implementation Plan

The Contractor must produce, maintain, and implement the Product Assurance Implementation Plan (PAIP) as per CDRL PA-01. The PAIP must be in accordance with the RCAM Product Assurance Requirements (RCAM-PAR) document (AD-02). The PAIP must define the approved methods of implementing the PA requirements within all organisations in the project. After approval by the PM, the Contractor must implement this Product Assurance Implementation Plan.

In the event that a requirement cannot be complied with, the Contractor must make a formal request to the PM for a deviation / waiver as per CDRL PA-10. The onus for obtaining such a concession lies with the Contractor. Without such a deviation / waiver, the PM will assume that the Contractor complies with all the requirements. In accordance with the RCAM Product Assurance Requirements (AD-02), the Contractor must establish a Non-Conformance Review Board (NCRB).

The approved PAIP must be used as the basis for determining compliance to PA requirements during any audits.

3.2.3 Safety Program

The Contractor must write a safety plan (part of PAIP) and implement a Safety review function for human safety while working in and around the cameras & lights.

The Contractor must prepare and deliver a Safety Assessment Report as per CDRL PA-11. The report must identify all safety features of the hardware and software, as well as procedural, hardware and software related hazards present in the camera and light. The Contractor must prepare a Hazard Report in accordance with the MSS RCAM PAR document (AD-02). A template is provided as part of CDRL PA-11.

3.2.4 Configuration and Data Management Plan (CADM)

The Contractor must maintain a Configuration and Data Management (CADM) process that:

1. Identifies the functional and physical characteristics of the Cameras & Lights;
2. Controls changes to those characteristics;
3. Provides status on change activity; and
4. Controls audits.

This process must be documented in either the PAIP (CDRL PA-01) or in the CADM Plan (CDRL PA-02).

3.2.4.1 Configuration Change Control

The Contractor must establish a Configuration Review Process for the purpose of comprehensively evaluating proposed or requested changes and variances and of assessing the total impact (technical, cost, schedule, risk, safety, etc.) of each change or variance. The Contractor must request approval from the PM before the implementation of any changes that affect requirements, safety, interface, form, fit, or function.

3.2.5 Qualification Program

The Contractor must conduct a qualification program per the RCAM-PAR document (AD-02) and produce a Qualification Status List (QSL), as per CDRL PA-14. A copy of the QSL must be delivered with the EIDP (CDRL PA-15). The Contractor must review the changes or differences between the item used for qualification and the final item being offered for acceptance. The changes or differences must be identified with the impact to the qualification status verified and listed in the final QSL.

3.2.6 Parts, Materials and Processes Program

3.2.6.1 Materials and Processes Plan

The Contractor must conduct a Materials and Processes program as per the RCAM PAR document (AD-02).

3.2.6.2 Parts, Materials and Processes Lists

The Contractor must establish mechanical parts, materials and processes program as per the RCAM PAR document (AD-02), and deliver a Declared Materials List (CDRL PA-08), a Declared Mechanical Parts List (CDRL PA-07), and a Declared Processes List (CDRL PA-09).

3.2.6.3 EEE Parts List

The Contractor must establish an Electrical, Electronic, and Electromechanical (EEE) Parts Program as per the RCAM PAR document (AD-02) for the selection, procurement, and control of high reliability EEE parts. The EEE Parts Program must comply with the requirements of the RCAM PAR document (AD-02), including the establishment of a Parts Control Board (PCB). The Contractor must deliver the EEE Parts list in accordance with the CDRL requirements (CDRL PA-06). The Contract must raise NSPARS as applicable and as required by the RCAM PAR document (AD-02).

3.2.7 Reliability Program

3.2.7.1 FMECA

The Contractor must conduct a reliability program per the RCAM PAR document (AD-02) and deliver the Failure Modes, Effects, and Criticality Analysis (FMECA) (CDRL PA-03) and the Critical Items List (CDRL PA-04) as specified in the RCAM PAR document (AD-02).

3.2.7.2 Parts Derating and Stress Analysis Report

The contractor must perform and deliver a Parts Derating and Stress Analysis Report (CDRL PA-05) in accordance with the RCAM PAR document (AD-02).

3.2.7.3 Radiation Analysis

The Contractor must perform and deliver a Radiation Analysis (CDRL PA-16) in accordance with the RCAM PAR document (AD-02). Parts selected without radiation test data must be tested in accordance with the RCAM PAR document (AD-02).

3.2.7.4 Worst Case Analysis

The contractor must perform and deliver a Worst Case Analysis Report (CDRL PA-17) in accordance with the RCAM PAR document (AD-02).

3.2.8 Software Product Assurance

The Contractor must perform the required software product assurance tasks on all software (including software incorporated in EGSE) and FPGA development and testing activities as specified in the RCAM PAR document (AD-02).

3.2.9 Cleanliness and Contamination Control

The Contractor must prepare, submit and implement upon PM approval a Cleanliness and Contamination Control Plan (CDRL PA-12) covering the criteria and Tasks for Cleanliness and Contamination Control (C&CC) and giving evidence of procedures and methods implemented to fulfil cleanliness and contamination control requirements. After establishing the cleanliness criteria for the RCAM components, the provisions, activities and verification methods necessary to achieve that goal must be identified for all stages of fabrication, handling, transportation and testing. After implementation of the Plan, a Contamination Analysis report must be submitted outlining the success of these measures, as per CDRL PA-13.

3.2.10 End Item Data Package (EIDP)

The Contractor must deliver an EIDP for the EQM and each of the FM units in accordance with the CDRL PA-15 which includes the delivery of software EIDP.

3.2.11 Audits

The Contractor must allow access by the PM and/or representative designated by the PM to perform audits of the Contractor and/or subcontractors to assess conformance to the contract and RCAM PAR document (AD-02). The Contractor must notify the PM of any audits of subcontractors or suppliers.

3.2.12 Functional and Physical Configuration Audits

The Contractor must perform Functional and Physical Configuration Audits (FCA, PCA) on the EQM and FM deliverables, as specified in the RCAM PAR document (AD-02).

3.2.13 Product Assurance Reporting

The Contractor must prepare and submit a monthly PA progress report as part of the Monthly Progress Report (CDRL PM-04). This must include a summary of PA activities during the reporting period, audit/inspections performed, and significant problems with their recommended solutions and corrective action status.

3.3 ENGINEERING

3.3.1 Systems Engineering

The Contractor must produce, maintain, and implement the Systems Engineering Management Plan as per CDRL SE-01. The Contractor must use accepted CSA's Systems Engineering methods and Practices (RD-01) or equivalent.

3.3.2 Verification Process

The Contractor must produce a Test Plan (CDRL SE-08) for verifying the requirements. Testing must be the preferred approach except where there is a clear justification accepted by the PM in accordance with CDRL SE-08. All requirements must be verified on the entire camera & light in compliance with the RCAM specification document (AD-01); a verification matrix is provided identifying verification methods.

The Verification and Test Plan must be complemented by analysis reports, test specifications, procedures (CDRL SE-012) and upon test completion by test reports (CDRL SE-013).

3.3.3 Requirements Validation and Traceability

The Contractor must comply with and validate the performance and quality requirements for cameras & lights as specified in the requirements documents (AD-01), and the Program Assurance Requirements (AD-02). The Contractor must produce a Technical Specification document according to CDRL-SE-09.

The Contractor must establish traceability between requirements from the top down, and identify overlaps, omissions and contradictions, and suggest changes needed to establish a consistent requirements baseline. Traceability of requirements must be established and maintained throughout the project.

3.3.4 Analyses

As part of the design process, the Contractor must undertake analyses of technical aspects of the design as specified in the subsequent paragraphs.

3.3.4.1 Environmental Analyses

The camera & light must be designed and shown by analysis and/or shown by testing to withstand the environments (vibration, shock, acoustic, thermal, etc.) specified in AD-01 and AD-02.

3.3.4.2 Structural Analyses

The camera & light mechanical performance will be calculated and analysed by means of Structural Mathematical Models (SMMs). The Contractor must supply these models according to CDRL-SE-18.

The Contractor must perform a detailed Stress Analysis (CDRL SE-15) in order to calculate structural margins of safety with appropriate factors of safety applied. Individual critical components will be analysed for margins of safety.

3.3.4.3 Thermal Analysis

The Camera & light thermal performance will be calculated and analysed by means of Thermal Mathematical Models (TMMs). The Contractor must supply these models according to CDRL SE-19. The Contractor must perform a thermal analysis (CDRL SE-16), with the following objectives:

1. Verify that internal parts and materials are below their maximum allowed temperatures under acceptance/qualification testing;
2. Verify the ability of the thermal design to maintain the internal required temperatures and intended heat flow pattern that ensure performance requirements under the worst flight cases;

The Contractor must use the parameters in RCAM Specification document (AD-01) for thermal design cases and the treatment of thermal analysis uncertainties.

3.3.4.4 Optical Analyses

The Contractor must perform Optical Analysis per CDRL SE-14.

3.3.4.5 EMI/EMC Analyses

The Contractor must perform EMI/EMC analysis per CDRL SE-04.

3.3.4.6 Parameter Budget Analyses

The Contractor must produce a Parameter Budget Report per CDRL SE-20.

3.3.4.7 Other Analyses

The Contractor must perform all other analyses required by the Test Plan (CDRL SE-08).

3.3.5 Camera & Light Mathematical Models

The Contractor must provide mechanical, structural, thermal, assembly models as specified in this section.

3.3.5.1 Finite Elements Models

The Contractor must deliver Structural Mathematical (FEM) models (CDRL SE-18) including proper documentation to show the main features of the models themselves and results of standard quality checks. The models, reproducing the structure in its static and dynamic main characteristics, must be delivered in an agreed format to CSA. The structural mathematical model of the camera & light must be detailed enough to predict the dynamic loads to size the structure elements, and the interface loads in particular, with sufficient accuracy. This means that it must be able to reproduce the low frequency modes with an upper limit to the frequency range to be defined on a case-by-case basis.

The finite element model must be accompanied by a clear description of the model itself and of the assumption made in the model, particularly concerning the boundary conditions at the hard mounted Interfaces. The FEM for the PDR will be used by the Integrator to verify the structural integrity at the ORU level. The contractor must update the FEM for the CDR to address issues with the model delivered at PDR.

3.3.5.2 CAD Models

Computer Assisted Drawing (CAD) models (CDRL SE-17).

The contractor must provide the native file of the 3D models of the camera & light design as a complete assembly with all lower models.

3.3.5.3 Thermal Models

The Thermal models must be delivered as per (CDRL SE-19). The Thermal models must reproduce the unit behaviour from a thermal point of view, therefore must be representative for the following characteristics:

1. Contact area
2. Overall dimensions
3. Radiative Area
4. Thermo-optical properties
5. Conductance
6. Dissipations in each mode (stand-by, operating, survival, etc)

The Thermal models must be regularly updated and delivered according to the design maturity.

3.3.6 Drawings and Parts Lists

The Contractor must prepare and maintain design drawings, schematics, layout with listing of Drawings, Engineering Change Notices (ECN) etc. as per CDRL SE-06.

4 PRELIMINARY DESIGN PHASE (PHASE B)

Preliminary design is the initial portion of the complete camera & light design effort. Two reviews are performed with the CSA to ensure that the design is proceeding in the desired manner, and that important issues are addressed before they become embedded into the camera & light design.

The preliminary design phase includes Interface design review (IDR) and the Preliminary design review (PDR). The Interface design review is a detailed iteration of the interfaces between the camera and light, and the CLA/CLPA and VDU systems and ORU structure.

4.1 PRELIMINARY DESIGN

The Contractor must develop an initial design of the camera/light kit such that it will permit verification that the design meets the requirements. The H/W and S/W Design Reports may be separate. The Design Document (CDRL SE-07 and CDRL SW-03) must include drawings and architecture elements, as well as justification elements through analysis.

The Contractor must produce layout drawings, assembly drawings, ICD drawings, per CDRL SE-06, that are not already provided under another CDRL.

All analyses performed as part of the design process must be submitted to the PM for review, along with the corresponding models that are due at the PDR per Table B-2.

4.2 SOFTWARE PRELIMINARY DESIGN

The contractor must produce, maintain, and implement the Software development plan per CDRL SW-01. to reflect the SW development process implemented.

The Software architectural design (CDRL SW-03) must be highly modular; the intent is to be able to replace or simulate any major function software package with minimal impacts as well as to be able to port or re-use software packages.

4.3 SOFTWARE REQUIREMENTS DEVELOPMENT

The Contractor must develop the software requirements as a part of the design process. The Contractor must deliver Software Requirements document as per (CDRL SW-02). Software functionality must meet the functionality and on-board processing requirements as defined in MSS RCAM System Specification document (AD-01).

4.4 SOFTWARE VERSION DESCRIPTION DOCUMENT

The Contractor must develop Software Version Description Documents (VDDs) as per CDRL SW-07 to describe all as-built configurations of the software.

4.5 SOFTWARE TESTING

The Contractor must develop Software test plan/procedure CDRL SW-04 and CDRL SW-05, and Software Verification Plan per CDRL SW-07. The results of SW test and verification must be documented in SW test report per CDRL SW-06.

4.6 INTERFACE CONTROL DOCUMENT

The Contractor must prepare and deliver an Interface Control Document per CDRL SE-22 and an Interface Verification Matrix per CDRL SE-03.

4.7 REQUIREMENT TRACEABILITY, VERIFICATION AND COMPLIANCE MATRIX

The Contractor must prepare a Technical Requirements Traceability, Verification and Compliance Matrix Model (CDRL SE-03) traceable to the MSS RCAM System Specifications and the MSS RCAM PAR documents (AD-01, AD-02).

This integrated Matrix must perform the following functions:

1. establish the traceability of the design to the requirements;
2. show the verification method for each requirement;
3. Demonstrate compliance with all the requirements, including pointers to the detailed technical data that demonstrates compliance.

This matrix may be developed incrementally as the project evolves from requirements development through design, manufacturing and testing.

4.8 SUPPORT EQUIPMENT DESIGN

The Contractor must develop a design of supporting equipment needed for testing camera & light. Support equipment drawings and/or specifications must be delivered per CDRL SE-06.

4.9 VERIFICATION PLANNING

The Contractor must complete the Test Plan (CDRL SE-08) by defining how each subsystem will be evaluated relative to its requirements.

4.10 INTERFACE DESIGN REVIEW (IDR)

The interface design review will establish the interface design and seek agreement between the camera/light contractor and the Integrator. The Contractor must participate in the IDR meeting; at which time the interface design of the camera/lights & the ORU's will be reviewed. The purpose of this review is to demonstrate that the interface design meets the requirements and the IDR exit criteria (CDRL PM-09)and that requirements have been flowed down to all levels, that interfaces have been defined that meet requirements, and that the project is ready to proceed with the preliminary design. This information must be summarized in a Review Presentation and satisfy the entry and exit criteria (CDRL PM-09).

4.11 PRELIMINARY DESIGN REVIEW (PDR)

The preliminary design should be a detailed initial iteration of the design of the camera & light, with critical data determined. Camera & light design includes all elements, not only the main product, but also supporting systems such as ground/test support equipments. The Contractor must prepare and hold a PDR meeting; at which time the preliminary design of each camera & light will be reviewed and all interface requirements have been demonstrated per PDR exit criteria (CDRL PM-09). The purpose of this review is to demonstrate that the preliminary design meets the requirements (including software requirements) and is feasible within the appropriate margins (mass, power, thermal, etc.) including cost and schedule constraints, that requirements have been flowed down to all levels, that interfaces have been defined that meet requirements, and that the project is ready to proceed with the detailed design. The Contractor must demonstrate that risks associated with technology readiness are understood and mitigated. This information must be summarized in a Review Presentation and satisfy the exit criteria (CDRL PM-09).

5 DETAILED DESIGN PHASE (PHASE C)

5.1 DETAILED DESIGN

The Contractor must develop the design of the camera & light to meet exit criteria of Critical Design Review and such that the Contractor demonstrates readiness to manufacture (CDRL PM-09). This design must be presented in the updated Design Document (CDRL SE-07) and drawings (CDRL SE-06). All analyses performed as part of the design process must be finalized and submitted to the PM for review, along with the corresponding models.

5.2 SOFTWARE DETAILED DESIGN

The Contractor must update and finalize the software documentation and must submit them to the PM.

The Contractor must update the Software Version Description Documents (VDDs) throughout the project (CDRL SW-07) to describe all as-built configurations of the software.

5.3 DETAILED DESIGN VERIFICATION

The Contractor must perform verification activities of the detailed design to demonstrate that it complies with the requirements. The Contractor must update the Requirements Traceability Verification and Compliance Matrix (CDRL SE-03), to replace the planned verification with the actual verification data including demonstrating compliance with all the requirements, including references to the detailed technical (analysis or test) data that demonstrates compliance to the requirements.

5.4 ENGINEERING QUALIFICATION MODEL (EQM) DESIGN AND TESTING

The Contractor must fabricate and test the EQM for camera and light. The EQM will be used to complete the qualification testing described in the MSS RCAM Specification document (AD-01) and in the MSS RCAM PAR document (AD-02). The Contractor must conduct a Test Readiness Review (TRR) prior to the start of any formal acceptance testing of the delivered hardware and software items. The Contractor must seek approval by the CSA PM to proceed with acceptance testing. A data package must be provided to CSA in accordance with CDRL PM-10.

The Contractor must support fit checks, interface checks, latency characterization, overlay alignment and integrated functional tests of the EQM at the Integrator facility currently located in Brampton, Ontario, such that results can be presented as part of the CDR.

5.5 SUPPORT EQUIPMENT DETAILED DESIGN

The Contractor must develop a detailed design of supporting equipment needed for assembly, integration, testing and operations. Support equipment drawings and/or specifications must be provided to the PM (CDRL SE-06).

5.6 VERIFICATION AND VALIDATION DETAILED PLANNING

The Contractor must develop the detailed Test Procedures (CDRL SE-11) and Test Reports (CDRL SE-12) needed for verification and validation according to the Test plan (CDRL SE-08).

5.7 CRITICAL DESIGN REVIEW (CDR)

The Contractor must prepare and conduct a CDR meeting, at which time the detailed design of the camera & light and its interfaces will be reviewed. The purpose of this review is to demonstrate that the detailed design meets all the system, interface and design requirements and is feasible within the cost and schedule constraints, and that the project is ready to proceed with the manufacturing production. The Contractor must demonstrate that risks associated with technology readiness are minimized and understood. This information must be summarized in a Review Presentation and satisfy the entry and exit criteria (CDRL PM-09).

6 MANUFACTURING, INTEGRATION AND TEST (PHASE D) - OPTION

6.1 FM MANUFACTURING, ASSEMBLY, INTEGRATION

Prior to the start of FM Manufacturing, assembly and integration, the contractor must ensure that formally approved documentation is available, including special processes descriptions, flow diagrams, plans, process control methods as well as personnel and facility certification and must be described in Manufacturing and Assembly plan (CDRL SE-10).

The Contractor must manufacture and assemble the camera & light, in accordance with the approved design, and with the planned verification executed at each assembly stage.

6.2 FM TESTING

Each camera & light FM must be subjected to functional tests as well as to environmental tests as specified in the MSS RCAM specification document (AD-01) and in the MSS RCAM PAR document (AD-02).

The detailed test sequence must be as identified in the approved Test plan (CDRL SE-08).

6.3 TEST ACTIVITIES

The Contractor must conduct a Test Readiness Review (TRR) prior to the start of any formal acceptance testing of the delivered hardware and software items. The Contractor must seek approval by the CSA PM to proceed with acceptance testing. A data package must be provided to CSA in accordance with CDRL PM-10.

Test results that demonstrate the acceptability of the deliverables must be presented in Test Reports (CDRL SE-12).

The Contractor must update the Requirements Traceability Verification and Compliance Matrix (CDRL SE-03) to replace the previous verification data with the actual verification data including references to evidence which show the compliance.

CSA must be invited with ten (10) business days warning to prepare travel for witnessing the test.

6.4 DOCUMENTS UPDATE TO AS-BUILT

The Contractor must update the Design documentation (CDRL SE-07) and drawings (CDRL SE-06) to the as-built condition.

6.5 PACKAGING, STORAGE, TRANSPORT AND HANDLING

The Contractor must provide Packaging, Storage, Transport and Handling Procedures (CDRL SE-13) for the deliverables, and to identify necessary procedures to be implemented following delivery to the CSA.

6.6 FM ACCEPTANCE AND PRE-SHIP REVIEW

The Contractor must hold an Acceptance Review and Pre-Ship Review for each FM Camera & light at the end of Phase D at the Contractor facilities. The purpose of this review is to demonstrate that the as-built and as-coded camera & light meets the agreed set of requirements and can be accepted, and that all open items (including but not limited to RID’s, Actions, NCR’s) have been closed and EIDP (CDRL PA-15) and EIVCN (CDRL SE-21) are complete and approved.

7 DELIVERABLE ITEMS

The Contractor must design, manufacture, test, and deliver camera & lights and associated software specified in Appendix A.

Formal acceptance of the deliverables will be carried out at the Contractor's premises, unless otherwise specified by the PM.

The Contractor must deliver all documentation described in the SOW and the CDRL items listed in Appendix B.

All delivered items will become and remain the property of CSA.

8 ACRONYMS AND ABBREVIATIONS

AD	Applicable Document
AIL	Action Item Log
AIT	Assembly, Integration and Test
AR	Acceptance Review
BIP	Background Intellectual Property
C&CC	Cleanliness & Contamination Control
CADM	Configuration and Data Management
CAD	Computer-Aided Design
CAGE	Commercial & Government Entity
CCB	Configuration Control Board
CDR	Critical Design Review
CDRL	Contract Deliverable Requirements List
CGRP	Controlled Goods Registration Program
CI	Configuration Item
CIDL	Configuration Items Data List
CIL	Critical Items List
CLA	Camera Light Assembly
CLPA	Camera Light Pan tilt Assembly
CM	Configuration Management
COTS	Commercial Off The Shelf
Contractor	Prime contractor
CSA	Canadian Space Agency
CSCI	Computer Software Configuration Item
DID	Data Item Description
DML	Declared Materials List
DMPL	Declared Mechanical Parts List
DPL	Declared Processes List
EEE	Electronic, Electrical, and Electromechanical
ECR	Engineering Change Request
EGSE	Electrical Ground Support Equipment
EIDP	End Item Description Package
EIVCN	End Item Verification Closure Notice
EQM	Engineering Qualification Model
EM	Engineering Model
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
ESD	Electro-Static Discharge
ETC	Estimate To Complete

FCA	Functional Configuration Audit
FEM	Finite Element Model
FIP	Foreground Intellectual Property
FM	Flight Model
FMECA	Failure Modes and Effects Critical Analysis
FTP	File Transfer Protocol
GFE	Government Furnished Equipment
GSE	Ground Support Equipment
ICD	Interface Control Document
IDR	Interface Design Review
IP	Intellectual Property
IR	Initial Release
IRD	Interface Requirements Document
IRS	Interface Requirements Specification
ISS	International Space Station
ITAR	International Traffic in Arms Regulations
KOM	Kick-Off Meeting
LET	Linear Energy Transfer
L&SE	Logistics and Sustaining Engineering
MRR	Manufacturing Readiness Review
MSS	Mobile Servicing System
MUA	Material Usage Agreement
NASA	National Aeronautics and Space Administration
NCR	Non Conformance Report
NCRB	Non Conformance Review Board
NDA	Non-Disclosure Agreement
NSPAR	Non Standard Parts Approval Request
ORU	Orbit Replaceable Unit
PA	Product Assurance
PAIP	Product Assurance Implementation Plan
PAR	Product Assurance Requirements
PCA	Physical Configuration Audit
PCB	Parts Control Board
PDR	Preliminary Design Review
PM	Project Manager
PMP	Project Management Plan
QA	Quality Assurance
QADP	Qualification Acceptance Data Package
QCM	Quartz Crystal Microbalance
QR	Qualification Review
QSL	Qualification Status List

RCAM	Replacement Camera
RFD	Request for Deviation
RFW	Request for Waiver
RD	Reference Document
RID	Review Item Discrepancy
S&MA	Safety and Mission Assurance
SCC	Stress Corrosion Cracking
SEMP	Systems Engineering Management Plan
SI	System International
SMM	Structural Mathematical Model
SOW	Statement Of Work
SPA	Software Product Assurance
SPFM	Single Point Failure Mode
SRS	Software Requirements Specification
SRU	Shop Replaceable Unit
STM	Structural Thermal Model
SW	Software
TA	Technical Authority
TAA	Technical Assistance Agreement
TBC	To Be Confirmed
TBD	To Be Determined
TBS	To Be Specified
TMM	Thermal Mathematical Model
TN	Technical Note
TRA	Technology Readiness Assessment
TRR	Test Readiness Review
UML	Universal Modeling Language
V&V	Verification & Validation
VCD	Verification Control Document
VDD	Version Description Document
VDU	Video Distribution Unit
WBS	Work Breakdown Structure
WPD	Work Package Description

APPENDICES

A CONTRACTOR DELIVERABLES

A.1 HARDWARE DELIVERABLES

The Contractor must deliver all hardware listed in Table A-1 and Table A-2 in event options are exercised. All items are delivered to CSA but may be shipped according to the instructions below.

TABLE A-1 – HARDWARE DELIVERABLES

	Description	Delivery Date	Shipped to
1	Engineering Qualification Model (EQM) and Shipping Container	CDR	Integrator (Brampton, On)

TABLE A-2 – HARDWARE DELIVERABLES (OPTION)

	Description	Delivery Date	Shipped to
2	Flight Model 1 (FM #1)	AR	Integrator (Brampton, On)
3	Flight Model 2 (FM #2)	AR	Integrator (Brampton, On)
4	Flight Model 3 (FM #3)	AR	Integrator (Brampton, On)
5	Flight Model 4 (FM #4)	AR	Integrator (Brampton, On)
6	Flight Model 5 (FM #5)	AR	Integrator (Brampton, On)
7	FM shipping container(s) – one per FM	AR	Integrator (Brampton, On)

A.2 SOFTWARE DELIVERABLES

The Contractor must deliver all software/firmware code listed in Table A-3 and Table A-4 in the event options are exercised. All software must be delivered on media that is directly compatible with the each respective delivered hardware. One set of software must be installed on the delivered hardware. All delivered non-COTS software developed on the project must include the source listings and source files, compiled files, design documentation, users' manuals, test results and associated plans and procedures. The software must be executable. Software required to compile the flight software must be included.

TABLE A-3 – SOFTWARE DELIVERABLES

Description	Delivery Date	Shipped to
EQM software/firmware source code	CDR	CSA

TABLE A-4 – SOFTWARE DELIVERABLES (OPTION)

Description	Delivery Date	Shipped to
FM #1 software/firmware source code	AR	CSA
FM #2 software/firmware source code	AR	CSA
FM #3 software/firmware source code	AR	CSA
FM #4 software/firmware source code	AR	CSA
FM #5 software/firmware source code	AR	CSA

A.3 DOCUMENTATION DELIVERABLES

The Contractor must deliver all documentation (CDRL items) listed in Appendix B, in the formats defined in the CDRL list and Appendix C. All documents must comply with the Deliverable Document and Data Requirements specified in DID 000.

B CDRL LIST

This Appendix defines the documentation, computer models, and analyses to be delivered by the Contractor.

B.1 ABBREVIATIONS USED

TABLE B-1 – CATEGORY OF APPROVAL

ABBREVIATION	DEFINITION
A	Approval
R	Review

B.2 DISTRIBUTION AND COPIES

All documents must be provided in the format specified in the relevant DID, ten (10) working days prior to the specified Review/Meeting unless otherwise indicated. Paper copies are not required.

B.3 CDRL TABLE

TABLE B-2 – CDRL TABLE

CDRL No.	Deliverable	Due Date	Version	Approval Category	Format/DID
PA-01	Product Assurance Implementation Plan (PAIP)	KOM	Final	A	041
PA-02	Configuration and Data Management Plan (CADM)	KOM	Final	R	001
PA-03	Failure Modes, Effects, and Criticality Analysis (FMECA)	PDR CDR	IR Final	R	010
PA-04	Critical Items List (CIL)	PDR CDR	IR Final	A	027
PA-05	Parts Derating and Stress Analyses	PDR CDR	IR Final	R	030
PA-06	Declared EEE Parts List	PDR CDR	IR Final	R	029
PA-07	Declared Mechanical Parts list	PDR CDR	IR Final	R	031
PA-08	Declared Materials List	PDR CDR	IR Final	R	028

CDRL No.	Deliverable	Due Date	Version	Approval Category	Format/DID
PA-09	Declared Processes List	PDR CDR	IR Final	R	032
PA-10	Request for Deviation (RFD) / Request for Waiver (RFW)	As req'd	Final	A	024
PA-11	Safety Assessment Report	PDR CDR	IR Update	A	038
PA-12	Cleanliness and Contamination Control Plan	PDR CDR	IR Final	A	034
PA-13	Contamination Analysis Report	CDR	Final	R	035
PA-14	Qualification Status List	PDR CDR	IR Final	A	025
PA-16	Radiation Analysis	PDR CDR	IR Final	R	036
PA-17	Worst Case Analysis	PDR CDR	IR Final	R	042
PA-18	Qualification Acceptance Data Package (QADP)	CDR	Final	A	059
PM-01	Project Management Plan	KOM PDR	IR Final	A	002
PM-02	WBS and WPDs and WP Dictionary	KOM PDR CDR	IR Updates Updates	A	008
PM-03	Project Schedule	KOM Monthly	IR Updates	R	MS-Project
PM-04	Monthly Progress Report	Monthly	Final	R	003
PM-05	Action Item Log	5 working days after each review/meeting	Updates	R	045
PM-06	Meeting Agendas	5 working days before review/meeting	Final	R	004
PM-07	Meeting Minutes	5 working days after each review/meeting	Final	R	005
PM-08	IP Disclosure Report	KOM PDR CDR	Draft IR Update	R	006

CDRL No.	Deliverable	Due Date	Version	Approval Category	Format/DID
PM-09	Review Data Package and Presentation	KOM IDR PDR CDR	IR IR IR IR	A	007
PM-10	Test Readiness Review Package	EQM TRR	IR	R	009
PM-11	Project Closure/Final Report	FR	Final	A	060
SE-01	System Engineering Management Plan (SEMP)	KOM	Final	R	012
SE-02	Product Tree	PDR CDR	IR Update	R	013
SE-03	Requirements Traceability, Verification and Compliance Matrices	PDR CDR	IR Update	A	015
SE-04	EMC Control Plan	PDR CDR	IR Update	R	058
SE-05	Technical Notes	As required	Final	R	Contractor Format
SE-06	Drawings, Schematics, Layouts with listing of Drawings and Engineering Change Notices, Interface Control Documents (Note: All 2-D drawings must be submitted in PDF format, with the capability to zoom)	PDR CDR	IR Update	R	Contractor Format
SE-07	Design Document	PDR CDR	IR Updates	A	016
SE-08	Test Plan	PDR CDR	IR Final	A	018
SE-09	Technical Specification	IDR PDR	IR Final	A	017
SE-10	Manufacturing and assembly plan	PDR CDR	IR Final	R	020
SE-11	Test Procedures	CDR TRR	IR Final	R	021
SE-12	Test Reports	Test or Demo +2 weeks	IR	A	022

CDRL No.	Deliverable	Due Date	Version	Approval Category	Format/DID
SE-13	Handling, Storage, Packaging Procedures	CDR	IR	R	048
SE-14	Optical Analysis Report	PDR CDR	IR Final	A	043
SE-15	Structural Analysis Report	PDR CDR	IR Final	A	047
SE-16	Thermal Analysis Report	PDR CDR	IR Final	A	047
SE-17	CAD Models	PDR CDR	IR Final	R	046
SE-18	Structural Mathematical (FEM) Models	PDR CDR	IR Final	R	046
SE-19	Thermal Models	PDR CDR	IR Final	R	046
SE-20	Parameter Budget Report	PDR CDR	Draft IR	R	049
SE-22	Interface Control Document (ICD)	IDR PDR CDR	Draft IR Final	A	061
SW-01	Software Development Plan	KOM PDR CDR	Preliminary IR Final	R	044
SW-02	Software Requirements Specification (SRS)	PDR CDR	IR Update	A	055
SW-03	Software Architecture Design Description Document	PDR CDR	IR Update	R	016
SW-04	Software Test Plan	PDR CDR	IR Final	A	018
SW-05	Software Test Procedure	CDR TRR	IR Final	R	021
SW-06	Software Test Report	10 days after tests	Final	A	022
SW-07	Software Version Description Document (VDD)	PDR CDR	Draft Update	R	057

TABLE B-3 – CDRL TABLE (OPTION)

CDRL No.	Deliverable	Due Date	Version	Approval Category	Format/DID
PA-03	Failure Modes, Effects, and Criticality Analysis (FMECA)	FM AR	Update (as req'd)	R	010
PA-04	Critical Items List (CIL)	FM AR	Update (as req'd)	A	027
PA-05	Parts Derating and Stress Analyses	FM AR	Update (as req'd)	R	030
PA-06	Declared EEE Parts List	FM AR	Update (as req'd)	R	029
PA-07	Declared Mechanical Parts list	FM AR	Update (as req'd)	R	031
PA-08	Declared Materials List	FM AR	Update (as req'd)	R	028
PA-09	Declared Processes List	FM AR	Update (as req'd)	R	032
PA-10	Request for Deviation (RFD)/Request for Waiver (RFW)	As req'd	Final	A	024
PA-11	Safety Assessment Report	FM AR	Final	A	038
PA-15	FM End Item Data Package (EIDP)	FM AR	Final	A	026
PM-03	Project Schedule	Monthly	Updates	R	MS-Project
PM-04	Monthly Progress Report	Monthly	Final	R	003
PM-05	Action Item Log	5 working days after each review/meeting	Updates	R	045
PM-06	Meeting Agendas	5 working days before review/meeting	Final	R	004
PM-07	Meeting Minutes	5 working days after each review/meeting	Final	R	005
PM-08	IP Disclosure Report	FM AR	Final	R	006
PM-09	Review Data Package and Presentation	FM AR	IR	A	007
PM-10	Test Readiness Review Package	FM TRR	IR	R	009
PM-11	Project Closure/Final Report	FR	IR	A	060

CDRL No.	Deliverable	Due Date	Version	Approval Category	Format/DID
SE-02	Product Tree	FM AR	Final	R	013
SE-03	Requirements Traceability, Verification and Compliance Matrices	FM AR	Final	A	015
SE-04	EMC Control Plan	FM AR	Final	R	058
SE-05	Technical Notes	As required	Final	R	Contractor Format
SE-06	Drawings, Schematics, Layouts with listing of Drawings and Engineering Change Notices, Interface Control Documents (Note: All 2-D drawings must be submitted in PDF format, with the capability to zoom)	FM AR	Final	R	Contractor Format
SE-07	Design Document	FM AR	Final	A	016
SE-11	Test Procedures	TRR	Final	R	021
SE-12	Test Reports	Test or Demo +2 weeks FM AR	IR Final	A	022
SE-13	Handling, Storage, Packaging, Procedures	FM AR	Final	R	048
SE-20	Parameter Budget Report	FM AR	Final	R	049
SE-21	End Item Verification Closure Notice	FM AR	Final	A	052
SE-22	Interface Control Document (ICD)	FM AR	Update	A	061
SW-02	Software Requirements Specification (SRS)	FM AR	Final	A	055
SW-03	Software Architecture Design Description Document	FM AR	Final	R	016
SW-05	Software Test Procedure	TRR AR	Final Update	R	021
SW-06	Software Test Report	10 days after tests	Final	A	022
SW-07	Software Version Description Document (VDD)	FM AR	Final	R	057

C DATA ITEM DESCRIPTIONS

DID-000….Deliverable Document and Data Requirements

PURPOSE

This DID describes the standard format for the preparation of deliverable project documentation. All documentation must be written in English and must be delivered in electronic format, on a DVD-ROM. When documentation is prepared in the Contractor's format, it must still meet the requirements of this DID.

PREPARATION INSTRUCTIONS

1. GENERAL INSTRUCTIONS

1.1. Electronic Copies

Electronic documents must be prepared using the most appropriate tool (Microsoft Word, Excel, MS Project, etc.); released versions must be delivered in the native electronic format. Documents whose native format is not a common MS Office program must be delivered in PDF in addition to the native format. Documents must be delivered via e-mail or direct transfer (FTP). For direct transfer, a notification of the document's readiness and location on a Contractor repository must be sent.

The electronic file name and the identification number written on the document itself must have the following format:

WXYZ-CDRL-NUM-CIE_ContractNumber_sent2013-03-30

where:

WXYZ: A 4-8 letter acronym of the project

CDRL-NUM: The CDRL Identifier

CIE: Name of the Company (no space, no hyphen)

ContractNumber: For example: _9F028-07-4200-03

_sentYEAR-MONTH-DAY: Date Tracking Number

Electronic documents or notifications of their availability on Contractor repositories must be sent to:

CM_Receipt@asc-csa.gc.ca

Emails are to contain the project/program acronym or equivalent identifier in the "Subject" line and include the CDRL identifier under which deliverable documents are being submitted. Hard copy and media deliverables are to be addressed to:

CM Library, 6A-100
Attention: CSA RCAM Project
Canadian Space Agency
6767, Route de l'Aéroport
Longueuil, QC, J3Y 8Y9
CANADA

The DVD-ROM label must present the following information:

Company Name
Project Name
Contract Number
Milestone

1.2. Metadata on deliverables

In order for CSA to be able to properly manage deliverables and the configuration as well as to process Contractor's deliverables in an efficient manner, the Contractor must, for each deliverable, provide the metadata as described in the following Table.

Provided by Supplier	Metadata Description	Comments
Yes	CSA Project Identifier	Project Acronym
Yes	Contract Identifier	PWGSC identifier
Yes	Contract Revision Identifier	PWGSC identifier
Optional	Contract Revision Date	
Yes	SOW Identifier	CSA Doc ID
Yes	SOW Revision Identifier	CSA Doc Revision ID
Yes	Document Type	Dwg, Doc, RFD, RFW, ECR, ECN, IP CR, IP CN/CD, QN, etc.
Yes	CDRL Identifier	Per CSA SOW (e.g. EN-006)
Yes	CDRL Sub-category Identifier	If multiple, separate subject documents per CDRL item (e.g. EN-006.03) (can be contractor defined)
Optional	Project WBS identifier	
Optional	SOW paragraph identifier.	
Optional	DID/ DRD Identifier	
Yes	Deliverable submission format	Electronic, Hard copy, On media (CD-ROM, etc.)
Yes	Deliverable Transmittal Identifier	e.g. CADM09-0123. Can also be a notification of delivery identifier
Yes	Deliverable Transmittal Date	
Yes	Originator's Organization Identifier	CAGE code, company name, short name, etc.
Optional	Document Author	
Yes	Deliverable Type	Dwg, Doc, RFD, RFW, ECR, ECN, NCR, Problem Report, IP CR, IP CN/CD, QN, etc.
Yes	Document Type	Specification, Design, Plan, Tech Note, Report, etc.
Yes	Originator's Document Identifier	

Provided by Supplier	Metadata Description	Comments
When applicable	Originator's Document Volume Identifier	
When applicable	Originator's Document Part Identifier	
When applicable	Originator's Document Issue Identifier	When both Issue and Revision are used concurrently to identify released documents
Yes	Originator's Document Revision Identifier	
Yes	Originator's Document Title	
Yes	Document Release Date	
Yes	Document Effective Date	Applicable to document changes, deviations, waivers,
Yes	Document Expiry Date	If applicable
When applicable	Originator's Authorizing ECN Identifier	Class 2 ECN approving document release and submission to customer
Yes	Document Maturity	Draft, Preliminary, Initial Release, Updated Revision, etc.
When applicable	Class	If deliverable is a change, deviation, waiver, etc. to a released item. (Class I, Class II)
Yes	Security Classification of Deliverable	Per Government of Canada definitions for Classified and Protected data (C,S,TS,PA,PB,PC)
Yes	Sensitivity of Document contents	Company Proprietary, Trade Secret, etc.
Yes	ITAR Content Indicator	Yes or No
Yes	Export Controlled Content Indicator	Yes or No
Yes	Affected Document Identifier	If deliverable is a change, deviation, waiver, etc. to a released document/drawing/model. Enables change-to-document, waiver-to-document relationships, etc.
Yes	Affected Document Revision Identifier	As above
Yes	Affected Document Title	As above
Yes	Product Breakdown Structure / Item Hierarchy Identifier	Critical for Item-to-Document Relationship
Yes	Associated Project/System Milestone Review	PDR, CDR, etc. When Reviews are at sub-system level, identify accordingly. e.g. Bus PDR
When applicable	Associated System Baseline	If different from Project Milestone
Yes	Filename of Deliverable	Filename and file type (for all representations submitted - .doc, .pdf, etc.). Original, revisable format to be delivered before contract completion.
Yes	Format of Deliverable / Application used to produce	MS WORD 2007, Project Scheduler 9, etc.
When applicable	Filename of Parent Deliverable Bundle	If part of a document Bill of Material
When applicable	Identification of Delivery Media	If physically delivered
When applicable	Originator's Repository Address of deliverable	To identify source location of document

1.3. Electronic Documents Format

Electronic copies of text documents must be formatted for printing on 8.5" x 11" paper.

1.3.1 Page Numbering

General format of documents should include page numbers and be formatted according to the Contractor's normal standard. If the document is divided into volumes, each such volume must restart the page numbering sequence.

1.3.2 Document Numbers

All pages must contain the Document Number at the top of the page. Document Numbers must include revision status and volume identification as applicable.

1.4. Updated Documents

Changes in previously released documents must be done in tracking mode.

2. DOCUMENT STRUCTURE AND CONTENT

2.1. Overall

Except as otherwise specified, all documents must have the overall structure as follows:

1) Cover/Title Page;
2) Table of Contents;
3) Scope;
4) Applicable and Reference Documents;
5) Body of Document; and
6) Appendices

2.2. Cover/Title Page

The title page must contain the following information:

1) Document Number and date: Volume x of y (if multivolume)
2) Rev. indicator / date of Rev.
3) Document Title
4) Project Name
5) Contract No.
6) CDRL Item No. or Nos., if one document responds to more than one CDRL, subject to prior approval from the PM.
7) Prepared for: Canadian Space Agency
8) Prepared by: Contractor name, CAGE Code, address, and phone number
9) Product tree identifier, if applicable
10) The following note:

2.3. Table of Contents

The Table of contents must list the title and page number of each titled paragraph and subparagraph, at least down to the third level inclusive. The Table of contents must then list the title and page number of each figure, Table, and appendix, in that order.

2.4. Scope

This section must be identified as section 1 and must, as a minimum, provide the following information:

1) Identification (number, title) of the system, hardware, or software to which the document applies;
2) A brief overview of the system to which the document applies; and
3) A summary of the purpose and content of the document.

The requirements specified in the following DIDs are the minimum expected. The Contractor must include in all documents all additional information required in order to ensure that the document provided will achieve its purpose as stated in the DID.

2.5. Applicable and Reference Documents

This section must list by Document Number and title, all applicable and reference documents. This section must also identify the source of all applicable and reference documents and the revision indicator.

2.6. Body of Document

The body of the document must be prepared in accordance with the content and format requirements defined in the specific Data Item Description.

2.7. Appendices

Appendices may be used to provide information published separately for convenience of document maintenance.

3. SUBMISSION OF DATA

Data must be submitted via Letter of Transmittal (or an electronic equivalent as mutually agreed by the TA and the Contractor), and acknowledged. The Letter of Transmittal will contain as a minimum, the Contract Serial Number, the CDRL Number and the Title. The Letter of Transmittal must be forwarded by the Contractor in two copies; one copy of acknowledgement to be signed and returned to the Contractor by the recipient.

4. ALTERNATIVE FORMAT

Alternative CDRL document format, content and submission methods can be submitted to CSA for approval so long as they meet the intent and purpose of the DID.

DID-001 CADM Plan

PURPOSE

The Configuration and Data Management (CADM) Plan establishes the Contractor's general approach, policies, and processes used for identifying the functional and physical characteristics of an item or system; controlling changes to those characteristics; recording and reporting documentation baselines and change processing, approval and implementation status; and verifying that the required functional and physical characteristics are achieved in the deliverable items.

The CADM Plan describes how consistency between the product definition, the product's configuration, and the configuration management records is achieved and maintained throughout the applicable phases of the product's life cycle. It also defines the methodology adopted to ensure the integrity of engineering data.

PREPARATION INSTRUCTIONS

The Configuration and Data Management Plan may be prepared in the Contractor's format. The CADM plan must be a self-standing document. The CADM plan must identify the context and environment in which configuration management will be implemented for the camera & light to be delivered. It must define the processes for establishing and updating the camera & light's configuration baseline and the implementation of: configuration identification; configuration control; configuration status accounting; configuration audits; and, data management.

The application of configuration management principles to ensure the integrity of digital representations of product information and other data must be described.

The CADM Plan must contain the following information, as a minimum:

1. A description of the organization and resources responsible for Configuration Management including:
    a) Authority and responsibility of organizational elements,
    b) Programmatic and organizational interfaces – relationship to other organizations within the project and within the company as a whole,
    c) Identification of personnel and requisite skill levels, and
    d) Sub-contract flow down or how configuration and data management requirements are flowed down to subcontractors and vendors providing sub-systems or components;
2. A detailed description of the Configuration Identification process including:
    a) Definition of product tree (or physical item hierarchy) and selection of sub-elements to be managed,
    b) Process for establishing traceability,
    c) Methods for naming, numbering, and marking,

d) Process, that uses the product tree as a framework, for establishing baselines and their associated milestones, including:

i) functional baseline,

ii) allocated baseline,

iii) Developmental configuration baseline, and

iv) product baseline,

e) method for identifying the configuration of software;

3. A detailed description of the configuration change management process used to control changes and variances (deviations and waivers), and maintain the developmental configuration(s) and associated documentation including:

a) the process by which changes and variances are submitted, recorded, classified, evaluated, approved/disapproved, and implemented

b) identification, description and specimens of the control forms to be employed

c) a description of the role and operation of the Configuration Control Board (CCB);

4. A description of the Configuration Status Accounting system to be used including a description of the content, format, and purpose of the status accounting records and reports;

5. A description of plans to conduct Configuration Verifications and Audits to ensure that Products conform with requirements including details on how configuration status accounting records and reports will be used in support of these verifications and audits

6. A description of Data Management processes and procedures for receipt, inspection, identification, storage, handling, access control, transmittal and delivery of project documents, forms, records and media. Data Management processes must also define how documents are released for authorized use or for submission to the customer for approval. The scope of Configuration and Data Management includes all digital data. Digital data is information prepared and maintained by electronic means, and provided by electronic data access, interchange, transfer, or on electronic media.

The plan must describe the processes that will be used to ensure the integrity of digital data and enhance data management practices such as:

1. File and database management;
2. Unique identification of documents, files and document representations;
3. Retention of essential file and version relationships;
4. Known data status; and
5. Controlled access to digital data.

The application of Configuration and Data Management to digital data is expressed in terms of the following elements:

1. Digital data identification;
2. Data status level management;
3. Maintenance of data dependency and product configuration relationships;
4. Data version control and management of review, comment, annotations, and disposition;
5. Digital data transmittal; and
6. Data access control.

The entire plan must ensure the establishment and implementation of the Configuration Management and Data Management program.

DID-002 Project Management Plan

PURPOSE

The Project Management Plan (PMP) is used to guide both project execution and project control.

The PMP is used by the Government to assess the adequacy of the Contractor's plan for management of the work and to provide a basis on which to monitor and assess the progress of the work.

PREPARATION INSTRUCTIONS

The PMP is used to:

- Guide the project execution;
- Document project planning assumptions;
- Document project planning decisions regarding alternatives chosen;
- Facilitate communications amongst stakeholders;
- Define key management reviews as to content, extent and timing; and
- Provide a baseline for progress measurement and project control.

When the Contract has specified delivery of another document that contains aspects of the required information, the PMP should summarize these aspects and refer to the other document.

Contractor format may be used. The PMP must contain the following information, as a minimum:

1. Introduction

a) Project Objectives;

b) Scope of the Plan; and

c) Applicable and Reference Documents.

2. Project Integration Management

This section must describe the processes planned to be used to ensure that the various elements of the project are properly coordinated. It must describe:

a) The overall project management strategy;

b) How the plan will be executed; and

c) Overall change control mechanisms.

3. Project Scope Management

This section must describe the processes planned to be used to ensure that the project includes all the work required, and only the work required, to complete the project successfully. It must address:

a) Initiation;

b) Scope Planning;

c) Scope Definition;

d) Scope Verification; and

e) Scope Change Control.

4. Project Time Management

This section must describe the processes planned to be used to ensure timely completion of the project. It must address:

a) Activity Definition;

b) Activity Sequencing;

c) Activity Duration Estimating

d) Schedule Development; and

e) Schedule Control.

This section must also include the detailed project baseline schedule. The baseline schedule must include all elements of the CWBS and must depict all linkages and dependencies.

5. Project Cost Management

This section must describe the processes planned to be used to ensure that the project is completed within the approved budget. It must address:

a) Resource Planning;

b) Cost Estimating;

c) Cost Budgeting; and

d) Cost Control.

This section must include the detailed milestones table with the value.

6. Project Quality Management

This section must describe the processes planned to be used to ensure that the project will satisfy the needs for which it was undertaken. It must address:

a) Quality Planning;

b) Quality Assurance; and

c) Quality Control.

7. Project Human Resources Management

This section must describe the processes planned to be used to make the most effective use of the people involved with the project. It must address:

a) Organisational Planning;

b) Staff Acquisition;

c) Team Development;

d) Project organizational chart; and

e) Key personnel.

8. Project Communications Management

This section must describe the processes planned to be used to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. It must address:

a) Communications Planning;

b) Information Distribution;

c) Performance Reporting; and

d) Administrative Closure.

9. Project Risk Management

This section must describe the processes planned to be used to identify, analyze and respond to projects risks. It must address:

a) Risk Identification;

b) Risk Quantification;

c) Risk Response Development; and

d) Risk Response Control.

This section must also include the detailed project risk assessment and plan to manage project risks.

10. Project Procurement Management

This section must describe the processes planned to be used to acquire goods and services ("products") from outside the Contractor's organisation. It must address:

a) Procurement Planning;

b) Solicitation Planning;

c) Solicitation;

d) Source Selection;

e) Contract Administration; and

f) Contract Closeout.

DID-003 Monthly Progress Report

PURPOSE

The Progress Report records the status of the work in progress during the previous calendar period. The Progress Report is used by the Government to assess the Contractor's progress in performance of the work.

PREPARATION INSTRUCTIONS

Contractor format may be used. The Monthly Progress Report must comprise the following sections:

1) *Summary of progress this month*: must provide a summary of main activities accomplished during the month.

2) Red-Yellow-Green chart: project manager's assessment of the status of programmatic, technical, schedule.

3) *Discussion of planned activities not accomplished:* must provide a summary of main activities not accomplished during the month, the reasons why and the potential impact on the project plan.

4) *Planned work next month*: must provide a summary of the planned important accomplishments for the following month, and must be limited to half a page.

5) *Technical/Design status:* must provide a summary of the status and description of the design, manufacturing, assembly, integration and testing activities accomplished during the month covering the following items:

   a) Key requirements;

   b) Design verification activities;

   c) Procurement status and issues;

   d) Major internal technical issues;

   e) Summary of waivers & Engineering Change Requests (ECRs);

   f) Problem/failure reports;

   g) Summary of PA activities during the reporting period, audit/inspections performed, and significant problems with their recommended solutions and corrective action status

6) Brief discussion of problems/concerns: must provide a summary of the current problems/concerns, their impact on the current plan, the plan to mitigate them and expected support from CSA to help resolve the situation.

7) *Schedule status table*: A status table must be provided on the milestone dates. It must be in the form of a Table showing, for each milestone, the baseline date, the forecast completion date in the previous month's report and the forecast completion date in this month's report. A short narrative must provide a rationale for any variation from the previous month's forecast. An update of the detailed schedule must be provided in native format (CDRL PM-03) showing the actual status, percentage of completion as well as the current baseline. In addition, the critical path to the next major milestone should be presented. Finally in case of a schedule slippage, a schedule recovery plan must be presented.

8) *Risk overview*: must report on changes to the risk situation. A Table must present the most critical risks facing the project and the trend of the risks with action plan to mitigate them.

9) Action items: it is CDRL PM-05. Not required in monthly report PM-04.

Each progress report must answer the following three questions:

1. Is the project on schedule?
2. Is the project risk level stable?
3. Is the project free of any areas of concern in which the assistance or guidance of the CSA may be required?

Each negative response must be supported with an explanation.

DID-004 Meeting Agenda

PURPOSE

Clarify the purpose and content of a meeting.

PREPARATION INSTRUCTIONS

Contractor format may be used. The meeting agendas must contain the following information, as a minimum.

1. **DOCUMENT HEADER:**
   a) Title;
   b) Type of meeting;
   c) Project title, project number, and contract number;
   d) Date, time, and place;
   e) Chairperson;
   f) Mandatory and desired attendance; and
   g) Expected duration.
2. **DOCUMENT BODY:**
   a) Introduction, purpose, objective;
   b) Opening Remarks: Technical Authority;
   c) Opening Remarks: Contractor;
   d) Review of previous minutes and all open action items;
   e) Project technical issues;
   f) Project management issues;
   g) Other topics;
   h) Review of newly created/closed action items, decisions, agreements and minutes;
   i) Set or confirm dates of future meetings

DID-005 Minutes of Meetings

PURPOSE

The minutes of reviews or meetings provide a record of decisions and agreements reached during reviews/meetings.

PREPARATION INSTRUCTIONS

Contractor format may be used. Minutes of meeting must be prepared for each formal review or meeting and must include the following information, as a minimum:

1. Title page containing the following:
   a) Title, type of meeting, date, time and duration.
   b) Project title, project number, and contract number,
   c) Space for signatures of the designated representatives of the Contractor and the Technical Authority,
   d) Name and address of the Contractor;
2. Purpose and objective of the meeting;
3. Location;
4. Agenda (DID-004);
5. Summary of the discussions, decisions and agreements reached;
6. List of the attendees by name, position, phone numbers and e-mail addresses as appropriate;
7. Listing of open action items and responsibility for each action to be implemented as a result of the review;
8. Other data and information as mutually agreed; and
9. The minutes must include the following statement:

"All parties involved in contractual obligations concerning the project acknowledge that minutes of a review/meeting do not modify, subtract from, or add to the obligations of the parties, as defined in the contract."

DID-006 Intellectual Property Disclosure Report

PURPOSE

The purpose of the Intellectual Property (IP) Disclosure Report is to define the project-unique technologies and information that were used and/or created under the contract.

PREPARATION INSTRUCTIONS

Definitions

Intellectual Property (IP): means any information or knowledge of an industrial, scientific, technical, commercial artistic or otherwise creative nature relating to the work recorded in any form or medium; this includes patents, copyright, industrial design, integrated circuit topography, patterns, samples, know-how, prototypes, reports, plans, drawings, Software, etc.

Background Intellectual Property (BIP): IP that is incorporated into the Work or necessary for the performance of the Work and that is proprietary to or the confidential information of the Contractor, its subcontractors or any other third party.

Foreground Intellectual Property (FIP): IP that is first conceived, developed, produced or reduced to practice as part of the Work under the Contract.

IDENTIFICATION

The Contractor must respond to the following 7 questions when Foreground Intellectual Property (FIP) is created under the Contract with the CSA.

1. Contractor Legal Name:
2. Project Title supported by the Contract:
3. CSA Project Manager of the Contract:
4. Contract #:
5. Date of the disclosure:
6. Will there be Contractor's Background Intellectual Property brought to the project:
   - ☐ Yes_ Complete Table 1 attached (Disclosure of Background Intellectual Property)
   - ☐ No
7. For Canada's owned IP, are there any IP elements that, to your opinion, would benefit from being patented by Canada?
   - ☐ Not applicable, FIP resides with the Contractor
   - ☐ Yes_ Complete Table 3 attached (Canada's Owned Additional Information)
   - ☐ No

BIP

- If the Contractor intends to use Background Intellectual Property (BIP) to develop the FIP, the Contractor must complete Table 1 (Disclosure of BIP brought to the project by the Contractor) and forward it to the CSA Project Manager before the beginning of the Contract.
- At the end of the Contract, the Contractor must review and update the BIP disclosure (Table 1) when applicable before closing of the Contract. Only the BIP elements that were used to develop the FIP elements should be listed.

FIP

- At the end of the Contract, the Contractor must complete Table 2 (Disclosure of the FIP developed under the Contract).
- If Canada is the owner of the FIP and identifies some FIP elements that would benefit from being patented by Canada, the Contractor must also complete Table 3 (Canada's Owned FIP Additional Information).
- The Contractor must sign below and deliver the completed Contractor Disclosure of Intellectual Property to the CSA Project Manager of the Contract for his/her approval before closing the Contract.

General Instructions for BIP and FIP tables

- Tables must be structured according to the CSA IP form provided.
- Each IP element must have a unique ID # in order to easily link the elements of the different tables.
- Titles of IP elements must be descriptive enough for project stakeholders to get a general idea of the nature of the IP.
- Numbers and complete titles of reference documents must be included.

TABLE 1. DISCLOSURE OF BACKGROUND INTELLECTUAL PROPERTY (BIP) BROUGHT TO THE PROJECT BY THE CONTRACTOR

1 **BIP ID#**	2 **Project Element**	3 **Title of the BIP**	4 **Type of IP**	5 **Type of access to the BIP required to use/improve the FIP**	6 **Description of the BIP**	7 **Reference documentation**	8 **Origin of the BIP**	9 **Owner of the BIP**
Provide ID # specific to each BIP element brought to the project e.g. BIP-CON-99 *where CON is the contract acronym*	*Describe the system or sub system in which BIP is integrated (e.g. camera, control unit, etc)*	*Use a title that is descriptive of the BIP element integrated to the work*	*Is the BIP in the form of an invention, trade secret, copyright, design?*	*Describe how the BIP will be available for Canada to use the FIP(e.g. BIP information will be incorporated in deliverable documents, software will be in object code, etc)*	*Describe briefly the nature of the BIP(e.g. mechanical design, algorithm, software, method, etc)*	*Provide the number and fill title of the reference documents where the BIP is fully described, The reference document must be available to Canada. Provide patent# for Canada if BIP is patented.*	*Describe circumstances of the creation of the BIP Was it developed from internal research or through a contract with Canada? If so, provide contract number.*	*Name the organization that owns the BIP. Provide the name of the subcontractor if not owned by the prime contractor.*

TABLE 2. DISCLOSURE OF THE FOREGROUND INTELLECTUAL PROPERTY (FIP) DEVELOPED UNDER THE CONTRACT

1 FIP ID #	2 Project Element	3 Title of FIP	4 Type of FIP	5 Description of the FIP	6 Reference documentation	7 BIP used to generate the FIP	8 Owner of the FIP	9 Patentability
Enter an ID # specific to each FIP element *e.g.FIP-CON-99* *where CON is the contract acronym*	*Describe the system or sub-system for which the FIP element was developed (e.g. a camera, ground control, etc)*	*Use a title that is descriptive of the FIP element.*	*Specify the form of the FIP e.g. invention, trade secret, copyright, industrial design*	*Specify the nature of the FIP e.g. software, design, algorithm, etc?*	*Provide the full title and number of the reference document where the FIP is fully described. The reference document must be available to Canada*	*BIP referenced in table 1 e.g.* BIP-CON-2, 15	*Specify which organization owns the FIP e.g. Contractor, Canada* or Subcontractor.* *Provide the name of the subcontractor if not owned by the prime contractor.* **If Canada is the owner of the FIP, complete Table 3 below* *Provide reference to contract clauses that support FIP ownership.* *Provide reference to WPDs under which the technical work has been performed.*	*In the case where the IP is owned by Canada, indicate with an "X", any IP elements described is patentable and complete Table 3 only for this IP.*

TABLE 3. CANADA'S OWNED FIP ADDITIONAL INFORMATION

1 FIP ID #	2 Title of FIP	3 Aspects of FIP that are novel, useful and non obvious	4 Limitations or drawback of the FIP	5 References in literature or patents pertaining to the FIP	6 Has the FIP been prototyped, tested or demonstrated? (e.g. analytically, simulation, hardware)? Provide results	7 Inventor(s)	8 Was the FIP disclosed to other parties?
ID# should be same as corresponding FIP element in Table2	*Title of FIP should be same as corresponding FIP element in Table2*	*How is the FIP addressing a problem (useful) and what is thought to be novel in this solution (novel)?*	*Describe the limitations of present apparatus, product or process*	*Provide references in published literature or patents relating to the problem or subject if any.*	*Describe briefly how the process, product or apparatus performed during testing or simulation. Provide reference document # where the performance is compiled if applicable.*	*Provide name and coordinates of the person(s) who created the FIP*	*Has any publication or disclosure of the FIP or any of its elements been made to third parties? If so, provide when, where and to whom.*

DID-007 Review Data Package and Presentation

PURPOSE

The Review Data Package is a collection of all documents to be presented by the Contractor for all formal Technical Reviews.

PREPARATION INSTRUCTIONS

Each Review Data Package must contain the documents identified in the CDRL Table (Table B-2) as due for that review, plus the presentations made at the meeting, the agenda, the minutes, open RIDs, open RFDs/RFWs, open QSRs, and the Action Items list.

The Review Data Package and Presentation must be prepared in such a way as to meeting the following entry and exit criteria for the review.

COMMON ENTRY CRITERIA

1. The review plan and agenda have been agreed by the CSA and all participants.
2. Action Items and RIDs from previous Reviews have agreed upon dispositions or been closed.
3. For Phase-ending Reviews, all work required by the SOW, PAR and System Specification applicable to the phase has been completed, except for the Review itself.
4. All documents identified for the review (reference CDRL table) have been placed under configuration control and provided to the CSA for review, at least 15 working days prior to the review.
5. The presentation package addresses all the review objectives.
6. Any regulations that might affect the preparation and execution for the review, such as the International Traffic in Arms Regulations (ITAR) and Controlled Goods Registration Program (CGRP) have been complied to such that the review can be held.

COMMON EXIT CRITERIA

1. All objectives of the review have been achieved.
2. All documents (as identified in the CDRL) have been reviewed and/or approved.
3. All RIDs generated as part of this phase, have a disposition agreed with CSA and all project partners.
4. Technology risk assessment and mitigation plan.(See RD-03)
5. Actions (if any) have clear descriptions, actionees and due dates.
6. The plan for the next phase has been approved by CSA.

Additional criteria are specified for each review below.

INTERFACE DESIGN REVIEW (IDR)

1. ENTRY CRITERIA

a) All formal agreements such as NDA's between parties are agreed, signed and in place

b) All interfaces of camera & light are defined and documented.

2. EXIT CRITERIA

a) The system, environmental, design and interface requirements are all clearly understood and verifiable.

b) All interface requirements with the CLA/CLPA ORU bases and MSS are clearly defined and provide the expected functionality and performance.to proceed with preliminary design.

c) All interface risks which could affect MSS video performance have been identified and addressed in order to proceed with preliminary design.

d) Budget allocations (mass, power, volume, data and video rates, etc.) are accurate and agreed upon.

e) All formats for deliverable models, analysis, documents, drawings and schematics are identified and agreed upon.

f) All parties have agreed that the above criteria has been met and formally documented and approved in the IDR Minutes and the contractor may proceed to PDR.

PRELIMINARY DESIGN REVIEW (PDR)

1. ENTRY CRITERIA

a) All documents, as identified in the CDRL table, have been provided.

b) System Requirements and ICDs are all complete and contain no TBDs or TBCs.

c) RCAM subsystem requirements and ICDs (if applicable) contain no significant TBD/TBCs and no significant issues.

d) All risks identified for Phase B have been addressed and results available.

e) Up to date project progress reports, including technical status, schedule actual data and projections to AR are available for review.

f) All interface requirements have been demonstrated with evidence.

2. EXIT CRITERIA

a) All documents (as identified in the CDRL) have been reviewed and/or approved.

b) All subsystem specification (if applicable) are traced to the RCAM System Specification.

c) Design and analysis adequately demonstrates that the preliminary design can be expected to meet all the requirements for system, operation, environment, design, external and internal interfaces, safety and PA.

d) Test plans and procedures adequately demonstrate validation of requirements can be achieved.

e) All technical issues or non-compliances have been identified and a plan for correction (i.e. NCR, deviation or waiver) or resolution is agreed to by the review board.

f) Preliminary system performance estimate have been provided and demonstrate that they will meet engineering budgets and margins.

g) Safety and PA plans are in provided and adequately demonstrate processes and controls to be implemented.

h) All risks have been identified for Phase C have been presented and mitigation or disposition agreed to.

i) All parties have agreed that the above criteria has been met and formally documented and approved in the PDR Minutes and the contractor may proceed to CDR.

CRITICAL DESIGN REVIEW (CDR)

1. ENTRY CRITERIA

a) All documents, as identified in the CDRL table, have been provided.

b) RCAM subsystem requirements and ICDs (if applicable) are complete.

c) Design and analysis is complete and provides a high degree of detail.

d) All risks have been identified for Phase C have been completed and results available.

e) Up to date project progress reports, including technical status, schedule actual data and projections to AR are available for review.

f) EQM test results.

2. EXIT CRITERIA

a) All documents (as identified in the CDRL) have been reviewed and/or approved.

b) Design and analysis is completed and demonstrates that the design can meet all the requirements for system, operation, environment, design, external and internal interfaces, safety and PA.

   a. All Class I ECNs (if applicable) have been approved by CSA.
   b. All drawings and documents for the manufacturing, assembly and test of FMs is ready for release.
   c. Software design has been validated through analysis and functional and qualification testing.

c) Functional testing is completed in accordance with the Verification Matrix and demonstrates camera and lights are performing according to specification.

d) Environmental testing has been performed to qualification levels and results have been provided to demonstrate that camera and lights performance/functionality has not been affected.

e) All camera and lights performance has been characterized and provided/presented.

f) All technical issues or non-compliances have been provided (i.e. NCR, deviation or waiver) and approved by the appropriate review board.

g) System performance estimates are updated and demonstrate that they will meet engineering budgets and margins.

h) An EQM, ground transportation container and packaging/handling documentation are available and ready for delivery to CSA.

i) Safety and PA plans are in place and have been implemented successfully.

j) Any remaining risks have been presented and mitigation or disposition agreed to.

k) All parties have agreed that the above criteria has been met and formally documented and approved in the CDR Minutes and the contractor may proceed with flight build

l) Readiness to manufacture demonstrated successfully.

ACCEPTANCE REVIEW (AR)

1. ENTRY CRITERIA

a) All documents, as identified in the CDRL table, have been provided.

b) All risks items have been retired and results available (if applicable).

c) FM Functional and Acceptance Level tests have been completed successfully and results reports provided.

2. EXIT CRITERIA

a) All documents (as identified in the CDRL) have been reviewed and/or approved.

b) FM validation and verification activities have been successfully completed. The Verification Matrix is complete and documents that all functional/performance and environmental acceptance test results demonstrate the FM is fully compliant with all system requirements.

c) The FM has been successfully qualified to demonstrate its capacity to survive the operating environment for the expected mission life with acceptable degradation.

d) Camera and lights performance characterization has been provided (for each unit).

e) The FM, ground transportation container and packaging/handling documentation are available and ready for delivery to CSA.

f) There are no outstanding safety or PA issues. All non-conformances have been properly documented and accepted by CSA.

g) All parties have agreed that the above criteria has been met and formally documented and approved.

DID-008 WBS and Work Package Descriptions

PURPOSE

The Contractor Work Breakdown Structure (WBS) must be used by the Contractor as the basis for work planning, estimating resources, scheduling the work, responsibility assignment, budgeting, work authorization, problem identification, performance management and analysis, and for reporting and controlling costs and schedule.

PREPARATION INSTRUCTIONS

The Contractor must provide a WBS describing all the project elements that organise and define the total scope of the project, and must be deliverable-oriented.

The Contractor must prepare and maintain a WBS Dictionary made up of WPDs for every element to the lowest level of the WBS. Each WPD must include, as a minimum:

a) A unique identifier traceable to the WBS;

b) A title;

c) The name of the individual responsible for completion of the work;

d) The scope of the Work Package (WP);

e) The start date and duration;

f) Required inputs and dependencies;

g) A description of every activity covered by the WPD including total hours, and all non-labour costs;

h) Assumptions;

i) Output and WP acceptance criteria;

j) Issue date;

k) Version number; and

l) List of deliverable with delivery milestone.

DID-009 Test Readiness Review Data Package

PURPOSE

The Test Readiness Review (TRR) is a presentation of the status of camera & light prior to start of a specific test.

It is a technical review that establishes functional compliance with all technical requirements prior to exposure to a specific test. The TRR is a major milestone in establishing functional capabilities prior to test exposure and is therefore a technical baseline of functional characteristics of the camera & light. Also, functional anomalies and their resolution will have been reviewed and formally closed out.

The TRR objectives include:

a) Establishing the camera & light readiness to function during test exposure, and permitting to proceed with the test program.

b) Confirming that in-place test procedures meet verification requirements and specifications.

c) Confirming that sufficient resources are allocated to the test effort.

d) Examining detailed test procedures for completeness and safety during test operations.

e) Determining that critical test personnel are test- and safety-certified.

f) Confirming that test support hardware and software is adequate, pertinent and verified.

PREPARATION INSTRUCTIONS

The TRR should include, but not be limited to, the following:

1. Test specifications and procedures
2. Test support requirements and status
3. Documentation status
4. Test equipment status and calibration
5. Functional and environmental test history of camera & light and subsystems
6. Anomalies and their resolution
7. Deviations and waivers
8. Open items and plans for closeout
9. Safety
10. Product Assurance
11. Schedules

DID-010 Failure Mode, Effects & Criticality Analysis (FMECA)

PURPOSE

To identify the failure modes, effect(s) and criticality and to systematically evaluate and document, by item failure mode analysis, the potential impact and severity of failures on the interface with the CLA/CLPA ORU.

The FMECA supports the following development activities: early mitigation of potential catastrophic and critical failures, additional design action, safety analysis, hardware/software interface analyses, test planning, mission planning, preparation of mandatory inspection points, fault detection and isolation, maintainability analyses and planning, maintenance planning, and logistics planning.

PREPARATION INSTRUCTIONS

The Contractor may use the guidelines and worksheets referenced in the PAR (AD-02) with the following mandatory items considered and addressed, as a minimum:

1. A functional block diagram for the indentured levels of subsystems analyzed, structured from top indentured level and down, to the lowest level where the failure contributing item resides;
2. Identification of the source of the reliability data utilized, i.e. from the Contractor's own field data for similar designs and applications, and/or references in the PAR (AD-02);
3. Identification of all single point failures, failure modes, their causes, effects and methods of mitigating such failures, identified as category i [catastrophic] and ii [critical];
4. Identification of ground-rules, assumptions and Contractor's interpretation of the completed analysis;
5. Identification of design weaknesses which affect system reliability goals;
6. Recommendations for design improvements, removal of Cat I and Cat II failures and/or reliability improvements;
7. The analysis must show the inter-related use of its findings and recommendations, to carry out critical/mandatory inspections to mitigate the failure risks;

For the PDR version, only a high-level FMECA is required. The FMECA must include a hazard analysis for GSE used in the testing of the flight hardware.

DID-0012 System Engineering Management Plan

PURPOSE

The purpose of the System Engineering Management Plan is to define and describe the approach to and details of all System Engineering activities to be performed by the Contractor and its lower-tier contractors.

PREPARATION INSTRUCTIONS

The SEMP must cover all engineering activities to be performed within the applicable contractual time and responsibility boundaries. The System Engineering Management Plan (SEMP) must describe how a fully integrated engineering effort will be managed and conducted through design, analysis, development, integration, and testing of the system. It must highlight key engineering methods and tools to be applied, and describe interfaces to external activities. It must also reference and make use of lower-tier Engineering Management Plans, and provide a coherent and consistent planning document for the entire Contractor Engineering program.

The System Engineering Management Plan must contain, as a minimum, a description of the specific engineering approaches, techniques, tools, organization, planning and scheduling of the technical effort necessary to accomplish the project objectives.

The following must be provided as a minimum:

- Systems Engineering Management
- Technical Organization with Responsibility Allocations
- Design and Development Plan
- Detail Interaction with the Integrator and Interface Management
- Technical Performance Measures and margin Philosophy
- Environmental Engineering
- Human Factors Engineering
- Procurement
- Configuration Management

CSA-SE-PR-0001, Rev B (RD-01) may be used as a guideline.

DID-0013 Product Tree

PURPOSE

To establish the hierarchical structure of the products that defines the project's scope.

PREPARATION INSTRUCTIONS

The product tree must be produced in a hierarchical and indented list form. It must have the structure of defined scope product items and their hierarchical division and subdivision, such that every sub-tree contains all products related to that respective node.

The subdivision must go down to the items of every project contract/subcontract (hardware and software must be defined). A hierarchical address code must be used. The product tree must identify the items' specification and the company responsible for each item.

The subdivision must be limited to items where management control is required for the following aspects:

- Configuration Control
- Cost
- Engineering
- Product Assurance
- Operation and logistics

The product tree must be a structure on its own and the basis for other structure. It must form the basis for an integration tree and the items of the product structure must constitute the only points of address for related services, such as management, documents, status reporting, model development, etc.

DID-015 Requirements Traceability Verification and Compliance Matrices

PURPOSE

Verification and Compliance Matrices show the details of the compliance of the camera & light and the verification thereof through the life of the project with respect to each camera & light requirement. It is a living document that is updated at each review with new data. The matrix is tightly coupled with the Verification and Test Plan because it provides the detailed linkage of verification activities to the specific requirements they address.

PREPARATION INSTRUCTIONS

The Requirements Verification and Compliance Matrices must contain, for each requirement:

1. The requirement document number and requirement identifier,
2. The requirement description,
3. Other relevant requirement references,
4. Verification method;
5. Requirement compliance based on verification data presented at the current phase,
6. For quantitative requirements, the actual predicted or achieved performance and the margin over the requirement,
7. Link to the verification data that justifies the compliance and the quantitative value (document, page and paragraph),
8. Comments, for example on plans to rectify non-compliances.

The Traceability Matrix must, as a minimum

1) Contain all requirements in the project, down to the Source Control Documents requirements;
2) Show how requirements are allocated to subsystems, and how they are decomposed and derived before application to subsystems; and
3) Point to analysis or budgeting documents as sources of requirements based on derivation and decomposition; the analysis is a step in between the parent requirement and the derived child requirement.

DID-016 Design Document

PURPOSE

To describe the features and capabilities of the camera and light as designed.

PREPARATION INSTRUCTIONS

The Design Document acts as an "answer" to the Technical Requirements Document for the camera & light or subsystem: the Requirements Document state what is needed, and the Design Document describes what is provided to meet these needs. The Design Document serves as the main reference text for users after delivery of the item, describing the full range of performance and functional capabilities of the item, as verified during the test/verification program.

Each document must contain, as a minimum:

1. Scope
   a) Camera & Light Overview
   b) Document Overview
   c) Acronyms

2. Camera & light Design
   a) Functional Block Diagram
   b) External Interfaces
   c) Subsystems Descriptions
   d) Internal Interfaces (Hardware and Software)
   e) Functional Description
   f) System Architecture
   g) Software Architecture

3. Optical Description

4. Mechanical Description
   a) Mass Properties
   b) Center of Gravity
   c) Physical Envelope
   d) Mating Surfaces
   e) Coordinates

5. Electrical Description
   a) Power
   b) Video/Sync
   c) Data
   d) Grounding and Bonding
   e) Wire Harness Design and Connectors

6. Operating Modes and States

7. Environmental Considerations Derived from Requirements.
   a) Loads (e.g. vibrations, shock, acoustics, depressurization, ground handling, etc.)
   b) Thermal interfaces (heat flux interface)
   c) EMI/EMC
   d) Electrostatic Discharge

8. Materials Interfaces

9. Human Factors Interfaces

10. Software Interfaces

DID-017 Technical Specification

PURPOSE

To identify all requirements for the camera and light SRU and subsystems establishing performance, design, development and verification, as per the RCAM System Specification (AD-01).

PREPARATION INSTRUCTIONS

The Contractor Technical Specification must contain, but is not limited to the following:

a) Definition of RCAM SRU, including definition of end-item deliverables.

b) Functional and performance requirements.

c) External Interface Requirements; definition and requirements for interfaces with MSS.

d) Operational interface requirements.

e) Resource allocations.

f) Requirements for physical characteristics.

g) Design and construction requirements and standards.

h) Packaging Requirements

i) Ground Support Equipment Requirements

j) Environmental requirements.

   (1) Structural/Mechanical design requirements

   (2) Thermal design requirements

   (3) Electrostatic and EMC design requirements

   (4) Radiation environment

   (5) Contamination

   (6) Transport and Ground environments.

k) Subsystem and Component requirements

l) Integration and test requirements.

m) Safety and reliability requirements.

n) Qualification and/or Verification requirements.

   1) Allocation of requirements to subsystems within the RCAM SRU.

o) Verification matrices..

p) Traceability matrices (CSA-SS-SG-0061 (AD-01)) .

q) Other applicable requirements types.

DID-018 Test Plan

PURPOSE

The verification process is defined by the Verification Matrix and Test Plan. The Verification Matrix identifies the method by which each requirement will be verified (e.g. test, analysis, by design, etc.) The plan defines the planning policies, methods of controls, and organizational responsibilities. From the Test Plan, the Test procedures are developed. The procedures provide the instruction, including configurations, constraints, and prerequisites, for obtaining data that show compliance with the requirements.

PREPARATION INSTRUCTIONS

The Verification Matrix and Test Plan must:

1. define the verification activities that will prove that the camera & light and subsystems meet all the imposed requirements including functional, performance, interface, environmental, etc. requirements,
2. define all verification activities at each phase of the project, including test, analysis, and inspection,
3. describe the methods and techniques to be used to measure, evaluate, and verify the camera & light. This is to include characterization of the camera & light behaviour that is not controlled by requirements but is important for understanding of the camera & light, and establishing the actual values of parameters that exceed requirements,
4. use an appropriate combination of simulation and analytical tools, mock-ups, laboratory models, engineering models and prototype models,
5. define the requirements for supporting facilities, analysis tools and test equipment, both existing and needing to be constructed. the configuration of the equipment to be used for each test,
6. define the schedule for verification activities.

For each defined test and analysis activity, the plan must contain:

1. a description of the activity,
2. the objective, including requirements to be verified,
3. supporting hardware and software,
4. assumptions and constraints that apply to the activity,
5. plans to install, setup, and maintain items in the test or analysis environment,
6. a description of the data recording, reduction, and analysis activities to be carried out during and after the activity.
7. Duration of activity

Verification Methods Definition

The verification program must be accomplished by employing one or more of the methods described in the following sub-sections.

Test

Verification by test is the actual operation of the camera & light, in clearly defined environmental conditions, to evaluate its performance.

Functional Tests

Functional testing is an individual test or series of electrical or mechanical performance test(s) conducted on the camera & light's hardware and/or software at conditions equal to or less than design specifications. Its purpose is to establish that the camera & light performs satisfactorily in accordance with design and performance specifications. Functional testing is generally performed at ambient conditions. Functional testing is performed before and after each environmental test or major move in order to verify camera & light performance prior to the next test/operation.

Environmental Tests

Environmental testing is an individual or series of test(s) conducted on the camera & light's hardware to ensure that the rover hardware must perform satisfactorily in an analog environment. Examples of environmental tests are vibration, acoustic, thermal, vacuum and EMC. Environmental testing may or may not be combined with functional testing depending on the objectives of the test.

Analysis

Verification by analysis is a process used in lieu of, or in addition to, testing to verify compliance to specification requirements. (e.g. stress, thermal, materials). The selected techniques may include camera & lights engineering analysis (structural, environmental, electrical, etc), statistics and qualitative analysis, computer and hardware simulations, and analog modelling.

Analysis may be used when it can be determined that:

a) Rigorous and accurate analysis is possible;

b) Test is not feasible or cost-effective;

c) Similarity is not applicable; and

d) Verification by inspection is not adequate.

Demonstration

Verification by demonstration is the use of actual demonstration techniques in conjunction with requirements such as serviceability, accessibility, transportability and human engineering features. In general, demonstration is specified as the method of verification for physical attributes which have no numerical requirements associated with them. This includes qualitative features such as comfort, accessibility, suitability and adequacy. Demonstration may also be specified for presence or compatibility of shipping containers, handling fixtures, etc.

Inspection

Verification by inspection is the physical evaluation of equipment and associated documentation to verify design features. Inspection is used to verify construction features, workmanship, dimensions and physical condition, such as cleanliness, surface finish and locking hardware. Often inspections are conducted in conjunction with a test or as part of assembly operations documented by manufacturing instructions.

Validation of Records

Validation of records is the process of using manufacturing records at end-item acceptance to verify construction features and processes for the camera & light hardware. Verification of records is specified whenever it is necessary to compare two or more documents to each other in order to assess compliance with a requirement. Common examples of the way verification of records is used include:

a) Examining drawings for features required by specifications;

b) Examining parts lists for ESD sensitive components;

c) Comparing two or more drawings to assess a mechanical interface;

d) Checking personnel records for proper training;

e) Checking facilities records for environmental exposure;

f) Examining vendor data supplied with parts or materials; and

g) Verification that analyses meet safety specifications.

Similarity

Verification by similarity is the process of assessing by review of prior test data or hardware configuration and applications that the article is similar or identical in design and manufacturing process to another article that has previously been qualified to equivalent or more stringent specifications.

Review of Design Documentation

Verification by review of design documentation is the process of reviewing the design against the requirements, which as stated may or may not contain specifics to be met by a test, analysis, etc. but must be present in the design. This method is used during the preliminary design and critical design reviews of the development phase.

DID-020 Manufacturing and Assembly Plan

PURPOSE

To define the overall manufacturing and assembly approach for all deliverable hardware and software.

PREPARATION INSTRUCTIONS

The Manufacturing and Assembly Plan must be established by providing the ground rules and implementation planning of the Manufacturing and Assembly activities. The test and analysis approaches may be covered in the Verification and Test Plan.

This plan may be prepared in the Contractor's format and must contain:

1. Manufacturing and assembly activity flows at camera & light, and subsystem level. A description of the past heritage (list of other missions of same or longer mission life, and same or worst environment) must be provided when applicable;
2. Identification of manufacturing processes, specifications, procedures, including special equipment, manufacturing location(s) and all applicable subcontractors;
3. Identification of assembly procedures;
4. Identification of special equipment, project GSE and facility, and definition of the utilisation flows for the assembly activities;
5. A graphical schedule of the activities (such as production readiness reviews, test readiness reviews), with identification of Mandatory Inspection Points and Key Inspection Points.

DID-021 Test Procedure

PURPOSE

Define the procedure to be followed for each test to be performed. This DID is applicable to systems, hardware and software.

PREPARATION INSTRUCTIONS

The test procedures may be in Contractor format and must contain the following information, as a minimum:

1. **SCOPE**
   This section must include a brief description of the test and the objectives of the test.
2. **TEST REQUIREMENTS**
   This section must define the measurements and evaluations to be performed by the test.
3. **TEST ARTICLE**
   This section must define in detail the test article configuration that is to be tested.
4. **TEST FACILITIES**
   This section must identify the test facilities to be used, including their configuration, their physical location, coordinates and contact points.
5. **PARTICIPANTS REQUIRED**
   This section must provide a listing of the individuals required to conduct or witness the test.
6. **TEST SET-UP AND CONDITIONS**
   This section must include description/sketches of test articles in test configuration illustrating all interfacing test/support equipment. Verification/functional logic must be shown where applicable. The section must include any environmental and cleanliness requirements.
7. **VERIFICATION, TEST EQUIPMENT AND TEST SOFTWARE**
   This section must provide a listing of the verification, test equipment and software that is to be used during the test.
8. **PROCEDURE**
   This section must define the step-by-step procedure to be followed, starting with the inspection of the test article, and describing the conduct of the test up to and including post-test inspection. Each test activity must be defined in sequence and Task-by-Task, including test levels to be used and measurements/recordings to be made. It must include any necessary malfunction and abort procedure.
9. **DATA ANALYSIS**
   This section must define the methods to be used in the analysis of the results, along with the uncertainty range in the results. Data presentation format must be defined.
10. **ACCEPTANCE/REJECTION CRITERIA TABLE**
    This section must provide data sheets needed during execution of the test specifying acceptance/rejection criteria, including identification of the associated requirements from the Requirements Documents or Specifications. These sheets will be in a tabular form allowing columns for measured values and deviations to be recorded. A computer printout generated by test software is acceptable provided it supplies the same information; however, the test criteria must be stated in the Test Procedure.

DID-022 Test Report

PURPOSE

Document the results of all tests (hardware and software) done on a unit, subsystem or camera & light.

PREPARATION INSTRUCTIONS

This DID is applicable to camera & lights, hardware and software.

The test report must document all tests performed to verify that the unit or software will meet the functional and operational requirements specified in the Requirements Documents or Specifications applicable to the unit.

The Test Report may be in Contractor format and must contain, the following information, as a minimum:

1. **APPLICABLE DOCUMENTS**

   This section must include test procedures and camera & light requirements/specifications being tested.

2. **TEST ARTICLE UNDER TEST:**

   This section must define in detail the test article configuration tested.

3. **PURPOSE:**

   This section must describe the purpose of the test and the specific requirements/specifications that it is intended to verify.

4. **SUMMARY OF TEST RESULTS**

   This section must present a summary of test results, including non-conformances, where applicable.

5. **TEST FACILITIES**

   This section must identify the test facilities used, including their configuration, their physical location, coordinates and contact points.

6. **TEST SET-UP AND CONDITIONS:**

   This section must include descriptions/photos/sketches of test articles in test configuration illustrating all interfacing test/support equipment. Verification/functional logic must be shown where applicable. The section must describe the environmental and cleanliness conditions present, as well as operating conditions (e.g. supply voltage).

7. **VERIFICATION, TEST EQUIPMENT AND TEST SOFTWARE:**

   This section must provide a listing of the verification, test equipment and software used during the test.

8. DETAILED TEST RESULTS:

This section must record actual test data obtained on Tabular sheets prepared in the Test Procedure (or software-generated) during the test performance, and deviations from the criteria.

11. TEST DATA ANALYSIS:

This section must document analyses required to relate the detailed results to the requirements to be verified.

9. NON-CONFORMANCES:

This section will provide all Non-Conformance Reports generated during the tests. The Non-Conformance Reports will be dated and stipulate the latest dispositions.

10. CONCLUSIONS AND RECOMMENDATIONS:

This section must identify deficiencies, limitations or constraints and propose alternative design solutions to be evaluated in order to resolve problems encountered in testing.

DID-024 Request for Deviation / Waiver

PURPOSE

A Request for Deviation/Waiver must be submitted for non-compliances to the program requirements and/or for equipment performance Class I non-compliances.

PREPARATION INSTRUCTIONS

A Request for Deviation or Request for Waiver must contain the following information, as a minimum:

ID	Data	Description	Deviation	Waiver
RFD/RFW Identification				
1.	Organization	Identification of the organization originating the RFD/RFW	**X**	**X**
2.	Number	Unique identification and register number	**X**	**X**
3.	Revision	Revision status of the RFD/RFW	**X**	**X**
4.	Date	Issue date of the RFD/RFW	**X**	**X**
5.	Classification	Classification (i.e. major or minor)	**X**	**X**
6.	Project	Project under which the nonconforming item is supplied	**X**	**X**
7.	Business agreement/ contract identifier	Business agreement / contract identification under which the nonconforming item is supplied (if applicable)	**X**	**X**
8.	Order	Order number under which the nonconforming item is supplied (if applicable)	**X**	**X**
9.	Originator site	Location of the request for deviation originator (if applicable)	**X**	**X**
Identification of Affected Item and Affected Documents				
10.	Item designation	Identification of the nonconforming item per name, manufacturer, part number and serial number (for a waiver), according to its configuration item data list	**X**	**X**
11.	Affected item(s)	Identification of the CI(s) (number and name) affected by the deviation of waiver	**X**	**X**
12.	Effectivity	Model or serial number (or batch / lot number) of the deviating or non-conforming item	**X**	**X**

ID	Data	Description	Deviation	Waiver
13.	Affected document(s)	Identification of the document(s) (specification, design drawing, etc.) to which the item does not conform (document number and revision/issue, paragraph or requirement ID)	**X**	**X**
14.	Short description	Title or short description of the RFD/RFW (consistent with the title of the related non-conformance report)	**X**	**X**
15.	Detailed description	Description of the deviation from the relevant requirement or design feature. / Description of the non-conformity, supported by sketches and attachments as appropriate. Include information on the origin of the deviation/waiver (design difficulties, non-conformance observed, procurement difficulties, ambiguous specifications, schedule constraints, etc.)	**X**	**X**
16.	Non-conformance Report	Identification number of the Non-conformance Report related to the request for waiver		**X**
17.	NCRB (Non-conformance Review Board)	Identification of the minutes of meeting of the NCRB which decided to raise the RFW		**X**
Technical and Programmatic Impact Assessment and Decision				
18.	Impact Assessment	Impact on cost, schedule, functionality, performance, reliability and safety	**X**	**X**
19.	Consequences of non-approval	Project impact if the deviation/waiver is not approved (cost and schedule)	**X**	**X**
20.	Rationale for acceptance	Reason why the proposed deviation/non-conformity can be accepted (supporting analyses, drawings, etc.)	**X**	**X**
21.	Adverse effects	Item characteristics affected by the deviation or non-conformity	**X**	**X**
22.	Limitation of use	Regarding the intended use		**X**
23.	Approval	Decision (Approval or Disapproval), names, date and signatures of the relevant authorities (Project Manager, Systems Manager, S&MA Manager)	**X**	**X**

DID-025 Qualification Status List

PURPOSE

The Qualification Status List (QSL) provides a qualification status of all hardware/software used on the End Item, and rolls up all lower units into a consolidated status list; the qualification categories of specific items are summarized.

PREPARATION INSTRUCTIONS

The Qualification Status List may be prepared in the Contractor's format. The qualification status of each component of the prime item must be listed in Table form. In the Table, columns must be provided to show:

1) Item (Ref. or Log Number);
2) Item Identification, (Subsystem/Unit Name) and Specification/Part Number, Revision Level;
3) Supplier (or subcontractor), Name, Category;
4) Heritage (list of other missions of same or longer mission life, and same or worst environment);
5) Comments (including an explanation of the qualification method chosen, environment, levels and duration and status).

The following specific information must be included in the above Table, as a minimum:

1) Item and Item Identification columns: the "Item" and the "Item Identification" columns present the major Subsystems/Units of the program;
2) Supplier column: refers to a given company at a given location;
3) Qualification Status column: one of the following categories must be used
    a. Identical to a flight, proven/qualified equipment operating in orbit at the time of reporting,
    b. Adapted from a flight, proven/qualified equipment, operating in orbit at the time of reporting,
    c. To be qualified during the present program,
    d. Already qualified as part of the present program, and
    e. Heritage: details the spacecraft/mission (if any) being used as a justification for qualification (or partial qualification) by similarity; and
4) Comments column: the qualification method, environment, levels and duration of an item is explained as necessary by comments.

Each item that is not already qualified must be included in the Qualification Program. For each item in the Qualification Program, the Qualification method (test procedure), environment, levels and duration must be identified.

DID-026 End Item Data Package (EIDP)

PURPOSE

Document the design, fabrication, assembly, integration and test of the deliverable assemblies (hardware and software).

PREPARATION INSTRUCTIONS

The End Item Data Package must provide, in a single document, the information necessary to accept the end item. The EIDP must contain all the documentation that provides visibility over the configuration, manufacture, assembly and test operations performed on the equipment delivered. Each EIDP must be initiated and maintained during all stages of assembly, inspection and acceptance test for each unit and will contain the traveler sheets. The interface control documentation/drawings provided in the EIDP must reflect the latest design status. The original EIDP must be submitted prior to the pre-shipment data review. The EIDP must contain the following information, as a minimum:

1. Title Page. The cover page of the deliverable data package will identify the item delivered:
    a) Item part name, number and serial number
    b) Model number (if applicable)
    c) Contract number (if applicable), and
    d) Contractor/supplier name (if applicable)
2) Index (Table of Contents);
3) Certificate of Conformance (C of C) with Requirements Verification Compliance Matrix: The C of C must state the item is verified and provide the following:
    a) Identification of applicable specification requirement document(s) (document number and revision level)
    b) Identification of applicable ICD document(s) (document number and revision level)
    c) Unit or item description, part number (vendor part number or Contractor part designation if applicable) and serial number
    d) Approval and signature by the Contractor/supplier PA and Technical Lead
4) RFD/RFW listing. TA-approved waivers and deviations to the contract authorizing hardware acceptance with existing variations, as applicable to the physical/functional parameters of the item qualified (i.e. form, fit, function);
5) Non-conformance and NCR Board reports: All Class I non-conformance reports or NCR Board reports and problem reports must be included; List of the Class II non-conformances by NCR number including description and the final disposition.

6) Component/Equipment Historical Logs: A log must be maintained to continuously document the history of the item or component. Each log must be chronologically maintained and will include dates, operating times or cycles, mate/de-mate cycles of life limited connectors, adjustments, modifications, operations or tests performed and all failures or anomalies (with cross-referencing to problem reports), special inspections or any other significant activity such as storage. Entries must be complete, self-explanatory, and traceable to the originator. Logs must be included into the next higher assembly's data package upon installation of the item into the next higher level of assembly;
7) List of temporary items and open work
8) Shipping documents
9) Handling, transportation and storage procedures
10) Identification of the as-designed and as-built configuration. An indentured parts list of the hardware being delivered must define the difference between the assigned as-designed configuration and the as-built configuration and supporting rationale for differences;
11) The as-built configuration parts list must include a traceability code for parts and materials used to build the end item unit.
12) Interface control documents for the deliverable end item
13) Configuration Items Data List (CIDL) containing a listing of all documents, including specifications, drawings, ICDs, software description documents, etc, including revision level, that are part of the deliverable end item
14) Test procedures;
15) Test reports;
16) Non-standard Calibration: record of measurement equipment, instrumentation, components, or systems having non-standard calibration curves must be provided at time of delivery;
17) End item weight; and
18) Pre-closure photos of items and major assemblies, including photos of boards and videos as applicable.

DID-027 Critical Items List

PURPOSE

The Critical Items List (CIL) contains a listing of items that can critically impact the reliability of contract end items. The list includes summaries of and references to specific documents defining compensating controls and features. The list is used to evaluate the adequacy and implementation of critical item controls.

PREPARATION INSTRUCTIONS

The Critical Items List may be prepared in the Contractor's format and must cover the elements described below, as a minimum.

1. CONTENT

Critical Items must be selected by the criteria specified in the RCAM PAR Document (AD-2); the Critical Items List must contain the following data:

1. Identification of each critical item with cross-reference information such that it is possible to trace directly to the related FMECA entry and to drawings, schematics, and hardware;
2. Identification of the page of the FMECA describing the related failure modes;
3. The reason or criteria causing the item to be classified as critical;
4. A summary in specific terms for each critical item of the compensating features, controls and other practices incorporated or planned to minimize the likelihood or effect of the critical items failing during the life of the program. Specific documentation containing compensating features must be identified. These controls can be specific design features, procurement controls, reliability tests and controls, manufacturing and handling controls, etc. Examples of compensating controls must include but not be limited to the following:
    a. Mandatory inspection of key product characteristics,
    b. Detail design review of critical failure modes,
    c. Control of soldering, welding, brazing, plating and flatness,
    d. Nitrogen purge, proof test, leak test, X-ray of brazed or welded joints,
    e. Special handling provision requirements: gloves, special care, specially trained personnel,
    f. Torque measurement control,
    g. Functional tests and verification of performance,
    h. Structural design margin and derating of loads,
    i. Special lubricant control,
    j. Moisture and temperature control,
    k. Special clean room environment and contamination controls,

l. Connector x-ray after mating,

m. Connector pin/socket retention tests,

n. Mate-demate logs for connector savers,

o. Special tracking of Failure Reports, Non-conformance Review Board actions and related discrepancy data,

p. Purchase Order review for Contractor inspection and PA Requirements,

q. X-Ray or non-destructive testing,

r. Extended actuation or life tests,

s. Special environmental tests,

t. Process baseline control, and

u. Mechanisms Life Cycle Test;

5. Identification of the activity that discovered the critical items, such as a FMECA, test planning, stress analysis, reliability prediction or risk assessment and reference to the related applicable documents;

6. The rationale for not eliminating the critical item or related failure mode(s):

    a. Single point failure mode (SPFM) which must include the added data specified in paragraph 3,

    b. Critical items must be listed by category as follows:

        i. Special environmental tests,

        ii. Single Point Failure (as a result of FMECA),

        iii. Parts out of accepted derating conditions,

        iv. Items with safety hazards,

        v. Parts or items using critical technologies (new part, new technology, radiation sensitive part, etc.),

        vi. Life Limited Items - items having a nominal lifetime shorter than the mission duration,

        vii. Critical materials with limited life or out-of-specification outgassing rates.

2. SUPPORTING DATA

The following information must be included if it has not been previously submitted (such as in the Reliability Plan) or if repetition is needed for clarity. If the supporting data is not included, a cross-reference to where it appears must be included in this section.

1. A list of criteria used to identify critical items;
2. A summary of the contractor's formal policy and procedures for critical item control and notification to affected personnel of the essential and critical nature of such items;
3. A description of the traceability system applicable to the critical items list to facilitate follow-up verification that all planned critical item compensating features, controls and practices have been implemented;
4. A description of the methods and plans for updating the critical items list to provide timely management visibility; and
5. An identification of critical items which are on calendar age limited life and limited operating life item lists when applicable.

3. SINGLE POINT FAILURE MODES (SPFM)

SPFM items must be compiled as a separate section of the critical items list. In addition to the data in paragraphs above the following must be included:

1. Each uncorrected SPFM must be characterized as to mission impact, probability of occurrence, and the practicality of correction; and
2. For each uncorrected SPFM, the list must include contractor recommended options for elimination or mitigation of the failure modes for procuring officer consideration.

4. UPDATES

Information not available for initial lists, due to incomplete design or planning details, must be so noted and provided when available.

DID-028 Declared Materials List

PURPOSE

The Declared Materials List (DML) establishes an inventory of all materials used in the camera and light design, to make sure that all the materials related requirements of the project are met.

PREPARATION INSTRUCTIONS:

GENERIC FORMAT AND CONTENT

The DML must contain a list of the materials that will be used for the manufacturing of the camera & light and must reflect the current design at the time of issue.

The DML must be broken down into categories to facilitate locating each item in the document.

The DML must as a minimum include the following information:

1. Item number (as the reference of the material in the DML);
2. Material type (commercial identification);
3. Chemical nature and type of product;
4. Procurement Information (manufacturer/supplier, procurement specification or standard);
5. Summary of processing parameters (e.g. finish, temper condition, mix ratio, curing);
6. Use and location;
7. Environmental code;
8. Size code;
9. Test data (corrosion, SCC, flammability, outgassing);
10. Approval status (with reference to the approval authority, MUA reference, test report and similar previous applications);
11. Identification of limited life material.
12. Any heritage information (list flight programs in which the material was used, list of other missions of same or longer mission life, and same or worst environment).

Coding or abbreviations used in the DML must be defined in the document. The consolidation of the list must be understood as technical and not as a compilation

DID-029 Declared EEE Parts List

PURPOSE

The Declared EEE Parts List establishes an inventory of all EEE parts used in the cameras and lights. It defines and tracks all candidates, approved, and as designed EEE parts for the cameras and lights to make sure that all requirements of the project are met.

PREPARATION INSTRUCTIONS

The DEPL must contain all EEE parts that will be used in the camera & light manufacturing and must reflect the current design at the time of issue.

The Contractor must provide a listing of all candidate EEE parts intended for use in the current design. The consolidation of the list must be understood as technical and not as a compilation.

The Parts Identification List must include the following information for each part, as a minimum:

1. Part description;
2. Generic part designation and number (commercial reference);
3. Part type (commercial reference);
4. Use and location (equipment name to the subassembly level);
5. Manufacturer (name, Commercial and Government Entity (CAGE) code, country of manufacture);
6. General information indicating part qualification status;
7. Any heritage information (list flight programs in which the part was used, (list of other missions of same or longer mission life, and same or worst environment);
8. Standard or Non-standard Part;
9. Approval Status (NSPAR #);
10. Procurement part number, as specified in the procurement specification or purchase order;
11. Package style;
12. Procurement specification reference;
13. Quality level;
14. Identification of parts subject to radiation lot testing and radiation data references (total dose and single event levels, if available);
15. Using assembly/subcontractor information; and
16. Comments – to indicate problems, long lead items, additional testing imposed, application unique notes, etc.

Updates to the parts list must identify changes from the previous submission. Any electronic database or spreadsheet format may be used, provided the required information is included.

DID-030 Parts Derating and Stress Analysis

PURPOSE

To ensure that all parts used in the camera & light operate within their derated stress limits and comply with project derating requirements.

PREPARATION INSTRUCTIONS

The Parts Derating and Stress Analysis Report may be prepared in the Contractor's format and must, as a minimum, contain the following information:

1. Analysis ground rules and assumptions.
2. Applicable schematics and Parts Lists;
3. List of EEE parts derated in accordance with MSS RCAM PAR (AD-02).
4. A EEE parts stress analysis to determine actual stresses and to compare them with the derated limits.
5. Part ratings versus part application worst case stress.

The above analyses must be performed in accordance with the CSA Project Assurance Requirements (PAR) (AD-02).

DID-031 Declared Mechanical Parts List

PURPOSE

The Declared Mechanical Parts List (DMPL) establishes an inventory of all mechanical parts used in the cameras and lights, to make sure that all requirements of the project are met.

PREPARATION INSTRUCTIONS

The DMPL must list all the mechanical parts that will be used in the camera & light manufacturing and must reflect the current design at the time of issue.

The DMPL must be broken down into categories to facilitate locating each item in the document.

The DMPL must as a minimum include the following information:

1. Item number (as the reference of the part in the DMPL);
2. Part designation (commercial designation);
3. Type of part;
4. Manufacturer (name, Commercial and Government Entity (CAGE) code, country of manufacture);
5. Manufacturer's procurement specification or standard;
6. Summary of functions and characteristics;
7. Use and location;
8. Environmental code;
9. Criticality and hazards;
10. Test data (corrosion, SCC, flammability, outgassing properties);
11. Approval status (with reference to the approval authority, test report and similar previous applications); and
12. Any heritage information (list flight programs in which the part was used, list of other missions of same or longer mission life, and same or worst environment).

Coding or abbreviations used in the DMPL must be defined in the document. The consolidation of the list must be understood as technical and not as a compilation.

Updates to the DMPL must identify changes from the previous submission.

DID-0032 Declared Processes List

PURPOSE

The Declared Processes List (DPL) establishes an inventory of all processes used in the cameras and lights manufacturing to make sure that all requirements of the project are met.

PREPARATION INSTRUCTIONS

GENERIC FORMAT AND CONTENT

The DPL must list all the processes that will be used in the camera & light manufacturing, and must reflect the current design at the time of issue.

The DPL must be broken down into categories to facilitate locating each item in the document.

The DPL must include the following information:

1. Item number (as the reference of the part in the Declared Processes List);
2. Process identification;
3. Process specification;
4. Process description (with associated materials designation where possible);
5. Use and location;
6. Process supplier;
7. Associated Declared Materials List item numbers;
8. Criticality;
9. Approval status (with reference to the approval authority, test report and similar previous applications).
10. Any heritage information (list flight programs in which the process was used, list of other missions of same or longer mission life, and same or worst environment).

Coding or abbreviations used in the DPL must be defined in the document. The consolidation of the list must be understood as technical and not as a compilation. Updates to the DPL must identify changes from the previous submission. Any electronic database or spreadsheet format may be used, provided the required information is included.

DID-034 Cleanliness and Contamination Control Plan

PURPOSE

Describe the procedures that will be implemented to control contamination generated by the camera & light, to establish contamination allowances and to limit the susceptibility of the camera & light to contamination from external sources.

PREPARATION INSTRUCTIONS

GENERIC FORMAT AND CONTENT

The Contractor must set forth a plan for controlling any degradation effects resulting from contamination. The plan must identify all anticipated contaminants expected from initial assembly through the design lifetime and specify the levels to be expected. The plan must address the proposed methods of minimizing the effects of such contaminants. The plan must define levels of cleanliness, design requirements and approach, and method/procedures for contamination control to be followed from start of contract through design lifetime. The plan must also alert the CSA to any unusual sensitivity to particular contaminants.

The Contamination Control Plan must include the requirements in AD-02, and as a minimum, the following information:

1. Environment control

a. Identify critical fabrication and assembly activities which will be performed in clean rooms or in clean room benches at the 100,000, 10,000, or 100 class level per FED-STD-209B.

b. Identify controls over atmospheric contaminants, temperature, and humidity, which will be used during electronic fabrication (including soldering), and testing.

c. Identify cleaning, inspection, and bagging to be used for parts, flight assemblies, and the assembled Bus Module.

d. Identify design features of shipping containers which will minimize contamination during shipping and storage.

e. Show that efforts to control contamination are consistent with controls to prevent electrostatic damage.

f. Indicate the methods and frequency for monitoring the cleanliness levels to ensure compliance with requirements.

g. Identification of analyses, inspections and tests that will be performed to verify that contamination has been prevented/abated and that the hardware will meet the performance requirements including the launch environment

h. Thermal vacuum test contamination monitoring plan, to include vacuum test data, QCM location and temperature, pressure data, system temperature profile, and shroud temperature.

2. Camera & light-generated contamination

a. Identification and description of each contamination sensitive unit or element;

b. Procedures to verify the selection of materials in order to minimize the use of contaminating materials;

c. Procedures to verify that materials that need to be subjected to off-gassing tests effectively pass such tests.

d. The nature of outgassing chemistry of materials;

3. Camera & light susceptibility to contamination

a. Identification of contamination standards to be met; and

b. Description of the methods to control the contaminants.

DID-035 Contamination Analysis Report

PURPOSE

To demonstrate that any contamination generated by the camera & light is properly controlled, and that the camera & light performance is not degraded by the overall environment. The report should include requirements for implementation, documentation, analysis, and specifications during all program phases.

PREPARATION INSTRUCTIONS

In support of the contamination and cross-contamination control system activities, the Contamination Analysis Report must include the following information, as a minimum:

1) Camera & Light-generated contamination:
    a. Identify all sources of contamination generated by the camera & light, including fluids and gases, and report on:
        i. Material types, specific outgassing/offgassing rates (if necessary, make reference to other documents reporting the required information),
        ii. Contamination generated by Configuration Item operation, and
    b. Define the appropriate countermeasures used to control the contamination sources identified in 1)a.
    c. Include methods to prevent and recover from contamination in orbit;
2) Camera & light susceptibility to contamination and evaluation of on-orbit degradation:
    a. Identify equipment sensitive to external contamination during the development and the operational phase, and the required level of control of contaminants for this contamination-sensitive hardware
    b. Define the appropriate countermeasures used to meet the specified performance for any equipment identified in 2)a., and
    c. Assess the expected degradation for contamination-sensitive hardware subjected to the expected level of contamination, including effects of atomic oxygen erosion and re-deposition and outgassing products on critical surfaces as input to the maintainability assessment and to maintenance planning.

DID-036 Radiation Analysis

PURPOSE

Demonstrate that the camera & light will operate satisfactorily in the specified radiation environment.

PREPARATION INSTRUCTIONS

This report must document all analyses, tests, and activities performed to establish the sensitivity of parts to radiation in terms of total dose effects and cosmic ray effects, and to demonstrate that the chosen design(s) and parts will operate satisfactorily throughout the mission(s) in the ionizing radiation environment applicable to the mission.

The report may be prepared in the Contractor's format and must contain the following information, as a minimum:

1. Radiation Environment: reference and inputs used to conduct the radiation assessment including assumptions on solar flares and model uncertainties;
2. Radiation Estimates: total absorbed doses and Linear Energy Transfer (LET) spectra must be predicted down to part levels. Methods and models used for these predictions must be described, including assumptions and the coordinate system used;
3. Critical Parts and Materials: radiation sensitive materials and parts must be listed. This listing must be based on information obtained from manufacturers or field data. A radiation sensitivity table must be generated indicating sensitive materials and parts, their radiation hardness (best estimates, manufacturer's data, test data, predictions from similarity, etc.), the expected types of effect: mechanical (etching, hardening, etc.), chemical (by-product formation, etc.) and electrical (latch-up, dielectric breakdown, power consumption, leakage, loss of gain, etc.);
4. Detailed Analyses: based on the total dose and Linear Energy Transfer (LET) spectra calculations must be performed for parts that exhibit marginal radiation hardness. Single Event Upset (SEU) rates and latchup sensitivities must be analyzed;
5. Qualification Issues: qualification status (for radiation) must be discussed during PDR and CDR; and
6. Conclusions: design margins must be discussed and recommendations must be made.

DID-038 - Safety Assessment Report

PURPOSE:

The Safety Assessment Report is a comprehensive evaluation of the mishap risk assumed prior to testing or operation of the MSS replacement cameras and lights. This report is an input to the Safety Data Package and ultimately is used by the CSA to prepare the Safety Package of the CLA and CLPA ORU's for submittal to NASA.

PREPARATION INSTRUCTIONS:

The Safety Assessment Report must identify all safety features of the hardware and software, and system design, as well as procedural, hardware and software related hazards present in the system. The hazard analyses must identify system design, integration and test, and launch site processing safety hazards and proposed hazard controls early in the design phase and as they are updated throughout the development effort. The Safety Assessment Report must include the safety analysis and hazard log in accordance with AD-02, and must also include the following data, as a minimum:

1. Safety criteria and methodology used to classify hazards;
2. Hazard reports documenting the results of the safety program efforts and any hazards that still have residual risk and the actions taken to reduce such risk along with specific safety recommendations or precautions required to ensure safety of personnel, property, or the environment.;
3. List of hazardous materials generated or used in the system;
4. Identify any stored energy sources in the cameras and lights (pressure vessel, Dewar, etc.) as well as any energy sources that can be passivated at end of life.
5. Recommendations applicable to hazards at the interface of the system; and
6. Conclusion with a signed statement that all identified hazards have been eliminated or
7. controlled to an acceptable level.

a. HAZARD REPORT #:	**HAZARD REPORT**	b. INITIATION DATE:
c. MISSION/PAYLOAD PROJECT NAME: PAYLOAD SYSTEM SAFETY ENGINEER:		d. REVIEW PHASE: ☐ SAFETY REVIEW I ☐ SAFETY REVIEW II ☐ SAFETY REVIEW III
e. SYSTEM/SUBSYSTEM:	f. HAZARD GROUP:	g. DATE:
h. APPLICABLE SAFETY REQUIREMENTS:		

HAZARD

i. HAZARD TITLE:	j. HAZARD CATEGORY & RISK LIKELIHOOD:
	☐ CATASTROPHIC ☐ FREQUENT ☐ CRITICAL ☐ REASONABLY PROBABLE ☐ MARGINAL ☐ OCCASIONAL ☐ NEGLIGIBLE ☐ REMOTE ☐ EXTREMELY IMPROBABLE

k. DESCRIPTION OF HAZARD:

l. HAZARD CAUSES:

MITIGATION

m. HAZARD MITIGATION/CONTROLS:
MITIGATED BY: ☐ DESIGN ☐ SAFETY DEVICES ☐ CAUTIONS/WARNINGS ☐ PROCEDURES/TRAINING
☐ OTHER

DESCRIPTION:

n. SAFETY VERIFICATION METHODS:

o. STATUS OF VERIFICATION:

a. HAZARD REPORT #: STATUS:	**HAZARD REPORT CONTINUATION SHEET**	b. INITIATION DATE:
c. MISSION/PAYLOAD PROJECT NAME: PAYLOAD SYSTEM SAFETY ENGINEER:		d. REVIEW PHASE: ☐ SAFETY REVIEW I ☐ SAFETY REVIEW II ☐ SAFETY REVIEW III
l. HAZARD CAUSES:		
m. HAZARD MITIGATION/CONTROLS:		
n. SAFETY VERIFICATION METHODS:		
o. STATUS OF VERIFICATION:		

DID-041 Product Assurance Implementation Plan

PURPOSE:

The Product Assurance (PA) Implementation Plan (PAIP) describes the organization, objectives, and PA activities planned for the project. The PAIP provides the Government with insight into the Contractor's PA organization, tasks, and activities and allows the Government to assess compliance with the governing PA requirements specified in the Product Assurance Requirements Document (AD-02) and in this SOW.

PREPARATION INSTRUCTIONS:

The Product Assurance Implementation Plan (PAIP) may be prepared in the Contractor's format. The PAIP must provide the following information, as a minimum:

- INTRODUCTION
  - Purpose and Scope
  - Applicability
  - Relationship to Other Documents
  - Document Conventions
  - Organization, Roles and Responsibilities
  - CSA Prerogatives
  - Acronyms and Abbreviations

- APPLICABLE AND REFERENCE DOCUMENTS
  - Applicable Documents
  - This section lists applicable documents that will be followed in the implementation of
  - the PAIP e.g.:

- *CSA Documents*
  - *In-house PA procedures and Standards*
  - *General standards and practices (Military, NASA, Industry, Software, etc.)*

- Reference Documents
  - This section lists documents that provide additional information or guidelines, but that are not compulsory.

- PRODUCT ASSURANCE PROGRAM
  - General Requirements and Approach to Product Assurance
  - QA System, ISO 9001 or Equivalent
  - Responsibility
  - Audits

    This section describes the audits to be performed throughout the life of the project including an audit schedule to be approved by the CSA S&MA representative. This applies to the Contractor and the subcontractors.
  - Mandatory Inspections
  - Project Reviews
  - PA Reporting

    This section describes the plans for monitoring the different phases of the program development, for problem reporting and for ensuring that corrective actions are taken.
  - CSA Notification

    This section specifies the frequency, format, and content of the PA reports submitted to program management to report program progress as well as problems, risks, and proposed solutions.
  - Requests for Deviations and Waivers
  - Product Assurance at Subcontractors Facilities

- QUALIFICATION PROGRAM

This section presents parts, materials and process control plans that describe the approach, methods, procedures and organization that will be implemented to assure compliance to the parts/materials/processes program requirements. This must include a commercial parts control plan in accordance with the requirements of the S&MA Requirements.

- Classification for Qualification Status
- Qualification Philosophy
- Qualification Status Reviews
- Qualification Process Requirements
- Qualification Status List
- Qualification Testing
- Acceptance Testing
- Statement of Compliance
- Flight Certification

- EEE PARTS PROGRAM
    - EEE Parts Selection
    - ESD Control Program
    - Non-standard Parts
    - Parts Control Board
    - NSPARS
    - Parts Specifications and Procurement
    - Custom Parts
    - Plastic Encapsulated Microcircuits
    - Parts Used on COTS Equipment for Flight Items
    - Value Added Testing
    - Part Analysis
    - Additional Part Requirements

- RELIABILITY

This section describes the objectives and tasks to be performed to ensure reliability and maintainability requirements are adequately implemented.

- Reliability Modeling
- Failure Mode, Effects, and Criticality Analysis (FMECA)
- Critical Items
- Worst Case Analysis
- Parts Stress Analysis
- Performance Trend Analysis
- Radiation Analysis
- Multipaction

- MECHANICAL PARTS, MATERIALS AND PROCESSES PROGRAM
    - Objectives
    - Materials and Process Selection
    - Qualification Of Mechanical Parts, Materials And Processes
    - Declared Mechanical Parts, Materials and Processes Lists
    - Materials and Processes Control Boards

- QUALITY ASSURANCE PROGRAM
  - Objectives
  - Design and Development Reviews
  - Procurement
  - Manufacturing
  - Verification, Testing and Inspection
  - Quality Documents and Records
  - Identification and Traceability
  - Non-conforming Item Control
  - Test Failure Reporting
  - Inspections, Handling, Storage and Shipping
  - Configuration and Data Management

- SOFTWARE PRODUCT ASSURANCE (SPA)
  - Organization And Responsibility
  - Software Categories and Applicability
  - Software Quality Evaluation Activities

- SAFETY PROGRAM
  - Objectives
  - Safety Requirements
  - Safety Responsibilities
  - Safety Activities

- APPENDIX A PA COMPLIANCE MATRIX

This Appendix presents a matrix testifying to the compliance with the applicable PA Requirements. The compliance matrix must include as a minimum the following:

a) Indicate the PAR specification paragraph and requirement;

b) Indicate the PAIP corresponding paragraph to address the requirement in the CSA PAR;

c) Indicate Compliance (C) or Non-compliance (NC) and reasons for NC; and

d) List of the contractor PA and process documents that will be used to address a requirement.

DID-042 Worst-Case Analysis

PURPOSE:

To verify that the design meets worst-case requirements defined in the RCAM Specifications (AD-01) and the PAR document (AD-02).

PREPARATION INSTRUCTIONS:

The Worst Case Analysis may consist of analyses performed on new design, review of previous design analysis or review of previous test or mission performance. It must address worst case conditions performed on each component. Since analysis details can be voluminous, the results of the analyses must be documented in reports that contain the following information to the extent practical.

1. Part Parameter, Variability Data, maximum and minimum limits;
2. Critical parameters and allowable variation. Provide justification why areas are not considered candidates for Worst Case Analysis;
3. Major contributors;
4. Circuits analyzed, with schematics of circuits;
5. How analyzed;
6. Variations considered;
7. Effect of environmental stresses on operational parameters;
8. Effect on mission life;
9. Solutions;
10. Analysis of results:
    a) Did it pass?
    b) If not, by how much? What actions are possible? What actions are planned?
    c) Life expectancy of unit?
11. Sufficient back-up must be retained for auditing and future reassessments.

DID-043 Optical Analysis

PURPOSE:

To provide a quantitative basis for camera and light optical system and functional performance assessment. The optical analysis supports validation of optical performance, and the ability of the as-built camera to meet requirements.

PREPARATION INSTRUCTIONS:

The optical analysis report must contain, as a minimum, the following information:

1. A description of the configuration analyzed.
2. Ray tracing (e.g. Zemax files) and image quality analysis for the imager module for the required wavelengths and dynamic range values for flight hot, cold and nominal operations cases.
3. Spectral throughput budget and signal to noise ratio analysis for the camera module for each wavelength channel for flight hot, cold and nominal operations cases.
4. Requirement data for all optical surfaces, substrates and coatings including long-life effects under space environment, specifically as applies to exterior of the International Space Station.
5. Thermal impacts of sunrise on optical performance.
6. A set of Tables demonstrating optical performance compliance metrics
7. Tolerance analysis. Model errors in the imperfection of parts (for example: index of refraction, radius of curvature, alignment) relative to the idealized ray trace in item 2, and give an estimation of the actual as-built performance.
8. Ghosting and straylight analysis. This intends to assess the performance of the system to out of field light and determine if there are significant secondary reflections.

DID-044 – Software Development Plan

PURPOSE:

To describe the management and technical approaches that governs the software development process. It describes what products and materials are received and delivered, how requirements are determined, and important aspects of the provider's relationship with the customer.

PREPARATION INSTRUCTIONS:

The Software Development Plan must cover all deliverable software and test-benches. The Software Development Plan must address the following, as a minimum:

1. A description of the SW development process and technical approach, including code generation strategies that stem from the Unified Modeling Language (UML) software design model;
2. Test facilities & simulation requirements;
3. SW qualification process including code reviews;
4. Traceability (from requirements to design);
5. Fault Tree Analysis;
6. Documentation tree;
7. Resource estimation and control
8. Performance parameter estimation and control;
9. Development of build plans and schedules; and
10. Interfaces to the Project Management, Hardware Engineering, Product Assurance, and Configuration Management.

DID-045 – Action Item Log

PURPOSE:

To manage and track action items raised over the course of the MSS camera and light work.

PREPARATION INSTRUCTIONS:

The action item log must track, as a minimum, the following, in a spreadsheet format:

1) Action item number
2) Action item title and brief description
3) Assigned date of the action
4) Source of Action Item (e.g. PDR meeting, RID, etc.)
5) Assigned organization
6) Actionee names
7) Due date of the action
8) Status, with the following valid entries: closed, open, overdue, ready to close
9) Closure evidence – upon readiness to close, this entry will track a referenced evidence that supports closure of the action.
10) Comments section

DID-046 – Models

PURPOSE:

To specify the format of the various models that will be developed in the course of the camera and light work. These models include but are not limited to thermal, structural (FEM), CAD models. These models need to be interchanged with the Integrator and with CSA, and must be provided in a format that can be transferred from one system to another. Supports design and feasibility of design to meet requirements in the design phase, and in some cases provides verification of compliance to requirements where this cannot be demonstrated directly by test or inspection.

PREPARATION INSTRUCTIONS:

All CAD models developed must be delivered as appropriate. Models must be delivered in the following formats:

a) Mechanical design: NX v7.5 (.prt); portable format: STEP 214 (.stp)

b) Electrical design: .dsn, .sch, Pspice and Gerber formats

c) Software design: UML 2.0 or XML

d) Finite element: NASTRAN format (.bdf or .dat)

In cases where a different tool is used from the one CSA uses, the model and outputs must be supplied in native format in addition to the required format. For generic modeling and analyses that don't use a specialty tool, CSA will accept Matlab, Excel and MathCad format data. Where a highly specialized tool is used or different from above, the delivery format must be negotiated with the TA. Translation from the Contractor's tool to the required format is only acceptable where the results can be repeated in CSA's tool. Translation that corrupts the model, loses data, or produces data that is interpreted differently, is not acceptable.

File format for exchange will be discussed and finalized at the KOM and/or IDR as appropriate.

Models must be provided in the following areas, as a minimum:

1. Design loads and dynamics analysis;
2. Strength and stress analysis;
3. Thermo-structural analysis; and
4. Modal analysis
5. External loads and thermally induced stresses
6. Mechanism life (if applicable)
7. Contact stress

DID-047 Analysis reports

PURPOSE:

To provide a quantitative basis for the camera and light design and interfaces (e.g. structural or thermal) to meet requirements and ICDs.

PREPARATION INSTRUCTIONS:

Analysis reports must contain all analysis work that is performed in support of the design. The analysis material must be sufficiently detailed that, in combination with the delivered models, CSA or an external reviewer can reproduce the results. The analysis must establish feasibility and verification of the design to meet the requirements.

The data must include references to sources such as equations, material values, parameters and properties.

The analysis report must contain, as a minimum, the following information:

1. Objectives of the analysis;
2. Reference to the relevant requirements;
3. Description of the analysis tools used;
4. Analysis/simulation software identification, including name and version;
5. Source file name and version;
6. Clear reference of the Configuration Item (CI) baseline assumed for the analysis;
7. Identification of the analysis constraints;
8. Explicit statement of the assumptions and of analysis methods adopted;
9. Description and justification of the mathematical models used;
10. Description of the main analysis steps and intermediate results;
11. Results obtained and compatibility with the requirements;
12. Identification of potential problem areas and presentation of alternative design solutions; and
13. Conclusion.

DID-048 Handling, Storage Packaging Procedures

PURPOSE:

To provide a handling, packing and storage procedures so as to ensure the camera and light SRU is not adversely affected by any ground transportation or storage environment.

PREPARATION INSTRUCTIONS:

The handling, storing, packaging procedures must contain at a minimum:

1. Proper handling techniques to be used for all ground processing and testing of the unit. This must include having any no-touch zones clearly identified.
2. Packing and unpacking step by step procedures.
3. Tools and ground support equipment and their classification must be clearly indicated.
4. Facility processing areas must be clearly identified and their required classification levels indicated.

DID-049 Parameter Budget Report

PURPOSE:

To provide a budget report on camera and light mass, center of gravity, and power.

PREPARATION INSTRUCTIONS:

This report must contain, at a minimum, the following:

1. Mass Budget with a breakdown of mass and center of gravity of the SRU. Each RCAM hardware unit will be measure for its weight/mass properties with comparison with “as designed”.
2. Power Budget with a breakdown of estimated and measured power of the RCAM identified at the camera and light subassemblies. For:
   a) Keep-alive (average and peak)
   b) Operational (average and peak, for short duration average)

DID-052 – End Item Verification Closure Notice

PURPOSE:

The End Item Verification Closure Notice (EIVCN) provides the formal closure of the camera and light verification requirements. This can be provided as one deliverable with the AR Data Package or throughout the project as requirements are closed.

PREPARATION INSTRUCTIONS:

The closure notice must identify the mandatory requirement being addressed and the associated evidence(s) for closure in accordance with the approved Verification Matrix.

DID-055 – Software Requirements Specification (SRS)

PURPOSE:

The Software Requirements Specification (SRS) is used to specify the requirements for all CSCIs and the methods to be used to ensure that each requirement has been met. Requirements pertaining to the CSCI's external interfaces may be presented in the SRS or in one or more Interface Requirements Specifications (IRSs) referenced from the SRS. The SRS, possibly supplemented by IRSs, is used as the basis for design and qualification testing of each CSCI.

PREPARATION INSTRUCTIONS:

Contractor format may be used. The following is a guideline of information to be provided.

1. Introduction
    1.1 Purpose
    1.2 Scope
    1.3 Definitions, acronyms, and abbreviations
    1.4 References
    1.5 Overview
2. Overall description
    2.1 Describe how software fits into overall system requirements, functionality of software and interfaces to RCAM/MSS hardware, operators, and communications to other software or firmware. Can be represented in a block diagram format
    2.2 Product functions provides a summary of the major functions that the software will perform (CSCIs).
    2.3 User characteristics
    2.4 Constraints
    2.5 Assumptions and dependencies
3. Specific requirements contain all the software requirements to a level of detail sufficient to enable designers to design a system to satisfy those requirements and testers to test that the system satisfies those requirements. This section should cover:
    3.1 External Interfaces
    3.2 Functions
    3.3 Performance requirements
    3.4 Design constraints (if applicable)

Appendixes

DID-057 – Software Version Description Document

PURPOSE:

To identify the contents of a Computer Software Configuration Item (CSCI) release and to record the details of all aspects of the system, support software and hardware required to regenerate this CSCI.

PREPARATION INSTRUCTIONS:

Contractor format may be used. As a minimum, the VDD must contain the following information:

1) Scope
   a) Identification
   b) System Overview
2) Documents
   a) Applicable Documents
   b) Reference Documents
3) Version Description
   a) Inventory of Materials released
      i) CSCI Source File Listing
      ii) Documentation
   b) Inventory of Software Content
   c) Changes Incorporated
4) Version Description – Support Items
   a) Support Items
      i) Hardware tools
         (1) Development platform hardware requirements
      ii) Software tools
      iii) Build procedures and development environment setup information
      iv) Installation procedures
      v) Validation test scripts, data and results
5) Known errors and possible problems
6) Notes

DID-058 – EMC Control Plan

PURPOSE:

To provide a definition of EMC Plasma and Ionizing/Non-Ionizing Radiation Effects Control requirements for cameras and lights and a plan to assure compatibility with MSS systems and International Space Station. It is used to derive detailed EMC requirements below the system level.

PREPARATION INSTRUCTIONS:

This document is the MSS EMC Plasma and Ionizing Radiation control plan to establish environmental compatibility within the RCAM and with the MSS.

The EMC control plan will cover the following subjects:

a) RCAM EMC Management control

b) RCAM design requirements (safety margin, critical test points grounding, bonding, cable harnesses, connectors, material selection, etc.) if not already provided in the RCAM Specification.

c) RCAM interference control requirements (applicable emission and susceptability requirements, and limits for the RCAM and its subsystems, limits budgeting, etc.), if not already provided in the RCAM Specification.

d) RCAM EMC test requirements, if not already provided in the RCAM Specification.

e) RCAM System design requirements (grounding bonding, filtering, circuit design, etc.), if not already provided in the RCAM Specification.

f) RCAM systems test requirements, if not already provided in the RCAM Specification.

g) Analysis and Prediction Techniques

h) QA Provisions

i) Plasma Design Requirements

j) Ionizing, Non-Ionizing, Radiation Design Requirements, if not already provided in the RCAM Specification.

k) Test Plans

l) Test Reports

DID-059 Qualification Acceptance Data Package (QADP)

PURPOSE:

To provide the historical record and documentation of an item used to qualify the design.

PREPARATION INSTRUCTIONS:

The Qualification Acceptance Data Package must provide, in a single document, the information necessary to accept the qualification of an Item. The QADP must contain all the documentation that provides visibility over the configuration, manufacture, assembly and test operations performed on the equipment qualified.

Each QADP must be initiated and maintained during all stages of assembly, inspection and qualification test for each unit and will contain the traveler sheets.

The interface control documentation/drawings provided in the QADP must reflect the latest design status.

The original QADP must be submitted prior to the qualification data review. The QADPs must contain the following information, as a minimum:

1. Title Page. The cover page of the deliverable data package will identify the item qualified.
   a) Item part name, number and serial number,
   b) Model number (if applicable),
   c) Contract number (if applicable), and
   d) Contractor/supplier name (if applicable);
2. Index;
3. Certificate of Conformance (C of C) with Requirements Verification Compliance Matrix; The C of C must state the item is qualified and meets all the applicable requirements and the ICD document (number and revision level) applicable. The requirements documents against which the unit was qualified must be listed in the C of C. The Contractor/supplier PA Lead and Technical Lead must sign the C of C.
4. RFD/RFW listing. TA-approved waivers and deviations to the contract authorizing hardware acceptance with existing variations, as applicable to the physical/functional parameters of the item qualified (i.e. form, fit, function);
5. Non-conformance and NCR Board reports: All Class I non-conformance reports or NCR Board reports and problem reports must be included;
6. Component/Equipment Historical Logs: A log must be maintained to continuously document the history of the item or component. Each log must be chronologically maintained and will include dates, operating times or cycles, adjustments, modifications, operations or tests performed and all failures or anomalies (with cross-referencing to problem reports), special inspections or any other significant activity such as storage. Entries must be complete, self-explanatory, and traceable to the originator and validated by

quality assurance. Logs must be included into the next higher assembly's data package upon installation of the item into the next higher level of assembly;

7. Notes/comments: This section of the QADP must be annotated as required to provide a more complete history of the equipment.
8. Identification As-built Configuration. An indentured parts list of the hardware being delivered must define the difference between the assigned as-designed configuration and the as-built configuration and supporting rationale for differences; The as-built configuration parts list must include a traceability code for parts and materials used to build the qualified unit.
9. Drawings. One copy of the assembly drawings, interface drawings, schematic and parts drawing of the deliverable end item;
10. Test procedures (Continuity, Functional, Performance, Vibration, Thermal Cycle, Bake-out, TVAC, Operating, Alignment);
11. Test reports;
12. Minutes of test results review;
13. Log book(s), when reference in test reports;
14. Non-standard calibration: record of measurement equipment, instrumentation, components, or systems having non-standard calibration curves must be provided at time of delivery;
15. End item weight; and
16. Photos of items and major assemblies, videos as applicable.

DID-060 Final Report

PURPOSE:

The purpose of the Project Closure/Final Report is to record formally the history of the Project, its achievements, financial, material and human resources expenditure, problems encountered and solutions implemented.

PREPARATION INSTRUCTIONS:

The Project Closure/Final Report must encompass all the work done for the entire project. It must be a comprehensive summary of the project work with the emphasis on the problems encountered, solutions implemented, successes encountered and lessons learned. It must include sufficient drawings, graphs, tables, figures, sketches and photographs as appropriate. The Project Closure Report must be a standalone document and must contain at least the following information:

1. Executive Summary
2. Comparison of system performance results against system requirements and objectives
3. Comparison of actual costs with estimates by major Work Package
4. Comparison of actual versus planned schedules and milestones
5. Comparison of risks anticipated versus actual experience
6. Problems encountered and solutions implemented
7. Final CDRL
8. Lessons Learned

DID-061 Interface Control Document (ICD)

PURPOSE:

The purpose of the interface control document is to define and control the interface between several cooperating or attached hardware configuration items (HWCI) or computer software configuration items (CSCI).

PREPARATION INSTRUCTIONS:

The ICD must describe the interfaces between a system or subsystem and all external systems or subsystems with which it interfaces (External ICD) and it must define all interfaces amongst subsystems within a system (Internal ICD).

The ICD must be structured by types of interfaces (as defined above), or by subsystem and then by types of interfaces under each subsystem.

The ICD must contain the following information, as a minimum, tailored as required by the type of ICD as described above, and the particular system and interfaces being defined:

1. Purpose
2. Applicable and Reference Documents
3. Identification (name, number) and brief overview of the system and role within the system, of the interfaces to which the ICD applies
4. Interface diagrams showing by name and identifier all interfaces among the HWCIs and CSCIs to which this ICD applies
5. Identification (name, identifier) and purpose of each of the interfaces
6. Physical/Mechanical Interfaces
   a) Coordinate System
   b) Dimensions and tolerances
   c) Units of Measurement
   d) Envelope, Volume and Mass Properties
   e) Attachment methods
   f) Alignment features
7. Structual/Mechanical Interfaces
   a) Applied Loads and Disturbances (including random vibrations, frequency spectrum)
   b) Acoustics
   c) Depressurization/Repressurization
   d) Ground Handling Environment

8. Thermal/Fluids Interfaces
   a) General Requirements (touch temperature, condensation prevention, etc.)
   b) Thermal Environment
   c) Subsystems Cooling
   d) Vacuum Exhaust Interfaces
9. Electrical Power Interfaces
   a) Electrical Power Requirements, Sources and Allocation
   b) Power Supply characteristics and limits
   c) Power Control
   d) Electrical Connectors (types, pinouts, locations, mating and demating)
   e) Cable schematics (internal and external)
10. Electromagnetic Compatibility (EMC)
   a) EMC Classifications
   b) Host system produced interference environment
   c) Bonding and grounding
   d) Power and signal circuits isolation

2) Command and Data Handling (C&DH)
   a) Communications Technology
   b) Signal Characteristics
   c) Response/Telemetry format
   d) Request/Command format
   e) Processing Requirements
   f) Data Acquisitions, Storage and Management
   g) Synchronization
   h) Application Programming Interfaces
11. Environmental Interfaces
   a) Any environmental factors not addressed elsewhere in the ICD (e.g. radiation, atmosphere, illumination, etc.)
12. Materials and Processes Interfaces
13. Human Factors Interfaces
14. Fire Prevention

ANNEX "B"

BASIS OF PAYMENT AND SCHEDULE OF MILESTONES

1. Baseline

1.1 Bidders must provide a firm price for each of the following phases of the project:

B1. Phase B _____$

B2. Phase C _____$

Total Firm Price CAN $. _____$
(Taxes extra, if applicable)

1.2 Milestones: The schedule of milestones for which payments will be made in accordance with the Contract is proposed as follows.

No	Milestone	Deliverables	% of Total Price (excluding options)	Date (months after contract award)
1.	IDR	Per Appendix A and B of Annex A – Statement of Work	16%	3
2.	PDR	Per Appendix A and B of Annex A – Statement of Work	23%	8
3.	CDR	Per Appendix A and B of Annex A – Statement of Work	54%	15
4.	Project Final Report - Project Close Out*	Per Appendix A and B of Annex A – Statement of Work	7%	15*

*In the event that some options are exercised, milestone 4 will be added to milestone 16 and be paid at the end of the project.

2. Options

2.1 Options: Bidders must provide a firm price for each of the following options:

Bloc A: Long Lead items: *

O1A: Long Lead items – Two (2) Cameras*** _____$

O2A: Long lead items – Three (3) camera*** _____$

O3A: Long lead items – Four (4) camera*** _____$

O4A: Long lead items – Five (5) camera*** _____$

*Only one option from Bloc A will be exercised within a period between contract award and 6 months following the CDR approval by CSA.
***Bidders must provide with the Long lead items cost, a detailed list of the items and delivery delays.

Bloc B: Phase D without long lead items: *

O1B: Phase D - Two (2) Cameras _____$

O2B: Phase D - One (1) extra camera _____$

O3B: Phase D - One (1) extra camera _____$

O4B: Phase D - One (1) extra camera _____$

*All options from Bloc B may be exercised within a period between contract award and 6 months following the CDR approval by CSA.
If options are not exercise at the same time, they will be exercise in the order presented above.

The Contracting Authority may exercise the options by sending a written notice to the Contractor.

2.2 Suggested Milestones: The schedule of milestones for which payments will be made in accordance with the Contract is proposed as follows.

No	Milestones	Deliverables	% of Total Price per option	Date (months after if option is exercise)
5.	Long Lead items	Per Appendix A and B of Annex A – Statement of Work	95% of Bloc A	When long lead item is received (latest

				arrived)
6.	Flight Model 1 - Functional Test Report	Per Appendix A and B of Annex A – Statement of Work	14.25% of O1B	7
7.	Flight Model 1 - Complete Acceptance Test Report, EIDP Delivered	Per Appendix A and B of Annex A – Statement of Work	33.25% of O1B	13
8.	Flight Model 2 - Functional Test Report	Per Appendix A and B of Annex A – Statement of Work	14.25% of O1B	7
9.	Flight Model 2 - Complete Acceptance Test Report, EIDP Delivered	Per Appendix A and B of Annex A – Statement of Work	33.25% of O1B	13
10.	Flight Model 3 - Functional Test Report	Per Appendix A and B of Annex A – Statement of Work	28.5% Of O2B	7
11.	Flight Model 3 - Complete Acceptance Test Report, EIDP Delivered	Per Appendix A and B of Annex A – Statement of Work	66.5% Of O2B	13
12.	Flight Model 4 - Functional Test Report	Per Appendix A and B of Annex A – Statement of Work	28.5% Of O3B	7
13.	Flight Model 4 - Complete Acceptance Test Report, EIDP Delivered	Per Appendix A and B of Annex A – Statement of Work	66.5 %Of O3B	13
14.	Flight Model 5 - Functional Test Report	Per Appendix A and B of Annex A – Statement of Work	28.5% Of O4B	7
15.	Flight Model 5 - Complete	Per Appendix A and B of Annex A – Statement of Work	66.5% Of O4B	13
16	Project Final Report - Project Close Out (to add to milestone 4)	Per Appendix A and B of Annex A – Statement of Work	5% of Bloc A and Bloc B	13

ANNEX “C”

SECURITY REQUIREMENTS CHECK LIST

The Security requirement Check List (SRCL), appended to the bid solicitation package, is to be inserted at this point and forms part of this document.

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
9F052-130905
Security Classification / Classification de sécurité
UNCLASSIFIED

SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine	OLISS OGD TEST ORGANIZATION	2. Branch or Directorate / Direction générale ou Direction	CSA/Space exploration developm
3. a) Subcontract Number / Numéro du contrat de sous-traitance		3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant	

4. Brief Description of Work / Brève description du travail

Design, Delivery, Development of Replacement Cameras for the Mobile Servicing System on the ISS.

5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?	No / Non ☐	Yes / Oui ☑
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?	No / Non ☑	Yes / Oui ☐

6. Indicate the type of access required / Indiquer le type d'accès requis

6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c)	No / Non ☐	Yes / Oui ☑
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.	No / Non ☑	Yes / Oui ☐
6. c) Is this a commercial courier or delivery requirement with no overnight storage? S'agit-il d'un contrat de messagerie ou de livraison commerciale **sans** entreposage de nuit?	No / Non ☑	Yes / Oui ☐

7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès

Canada ☑	NATO / OTAN ☐	Foreign / Étranger ☐

7. b) Release restrictions / Restrictions relatives à la diffusion

Canada	NATO / OTAN	Foreign / Étranger
No release restrictions / Aucune restriction relative à la diffusion ☑	All NATO countries / Tous les pays de l'OTAN ☐	No release restrictions / Aucune restriction relative à la diffusion ☐
Not releasable / À ne pas diffuser ☐		
Restricted to: / Limité à : ☐	Restricted to: / Limité à : ☐	Restricted to: / Limité à : ☐
Specify country(ies): / Préciser le(s) pays :	Specify country(ies): / Préciser le(s) pays :	Specify country(ies): / Préciser le(s) pays :

7. c) Level of information / Niveau d'information

Canada		NATO		Foreign / Étranger	
PROTECTED A / PROTÉGÉ A	☑	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ	☐	PROTECTED A / PROTÉGÉ A	☐
PROTECTED B / PROTÉGÉ B	☑	NATO RESTRICTED / NATO DIFFUSION RESTREINTE	☐	PROTECTED B / PROTÉGÉ B	☐
PROTECTED C / PROTÉGÉ C	☐	NATO CONFIDENTIAL / NATO CONFIDENTIEL	☐	PROTECTED C / PROTÉGÉ C	☐
CONFIDENTIAL / CONFIDENTIEL	☐	NATO SECRET / NATO SECRET	☐	CONFIDENTIAL / CONFIDENTIEL	☐
SECRET / SECRET	☐	COSMIC TOP SECRET / COSMIC TRÈS SECRET	☐	SECRET / SECRET	☐
TOP SECRET / TRÈS SECRET	☐			TOP SECRET / TRÈS SECRET	☐
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT)	☐			TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT)	☐

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
9F052-130905
Security Classification / Classification de sécurité UNCLASSIFIED

PART A *(continued)* / PARTIE A *(suite)*

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets? — ☑ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?
If Yes, indicate the level of sensitivity:
Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets? — ☑ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

Short Title(s) of material / Titre(s) abrégé(s) du matériel :
Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

☑ RELIABILITY STATUS COTE DE FIABILITÉ	☐ CONFIDENTIAL CONFIDENTIEL	☐ SECRET SECRET	☐ TOP SECRET TRÈS SECRET
☐ TOP SECRET– SIGINT TRÈS SECRET – SIGINT	☐ NATO CONFIDENTIAL NATO CONFIDENTIEL	☐ NATO SECRET NATO SECRET	☐ COSMIC TOP SECRET COSMIC TRÈS SECRET
☐ SITE ACCESS ACCÈS AUX EMPLACEMENTS			

Special comments:
Commentaires spéciaux : _____

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.
REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work? — ☐ No / Non ☑ Yes / Oui
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?
If Yes, will unscreened personnel be escorted? — ☐ No / Non ☑ Yes / Oui
Dans l'affirmative, le personnel en question sera-t-il escorté?

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises? — ☐ No / Non ☑ Yes / Oui
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

11. b) Will the supplier be required to safeguard COMSEC information or assets? — ☑ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises? — ☑ No / Non ☐ Yes / Oui
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data? — ☐ No / Non ☑ Yes / Oui
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS?

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency? — ☑ No / Non ☐ Yes / Oui
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale?

PART C - *(continued)* / PARTIE C - *(suite)*

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.
Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.
Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category / Catégorie	PROTECTED / PROTÉGÉ			CLASSIFIED / CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET	NATO RESTRICTED / NATO DIFFUSION RESTREINTE	NATO CONFIDENTIAL / NATO CONFIDENTIEL	NATO SECRET	COSMIC TOP SECRET / COSMIC TRÈS SECRET	PROTECTED / PROTÉGÉ A	PROTECTED / PROTÉGÉ B	PROTECTED / PROTÉGÉ C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET
Information / Assets / Renseignements / Biens		✓														
Production																
IT Media / Support TI		✓														
IT Link / Lien électronique																

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☑ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☑ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
9F052-13-0905 (20130905)
Security Classification / Classification de sécurité

PART D - AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature
Glen Bilodeau	Senior Engineer, Project Management	

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
450 926 5003	450-926-4576	glen.bilodeau@asc-csa.gc.ca	JAN 28, 2014

14. Organization Security Authority / Responsable de la sécurité de l'organisme

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature
Gilles Vezina	Manager, Security and Facilities	

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
450- 926 6448		Gilles.Vezina@asc-csa.gc.ca	2014-01-29

15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached?
Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes? ☒ No / Non ☐ Yes / Oui

16. Procurement Officer / Agent d'approvisionnement

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature
~~Naoual Guerinik~~ Jessie Jutras	Supply Specialist	

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
~~514-496-3409~~ (450) 926-6670	~~514-496-3822~~	~~Naoual.Guerinik@tpsgc-pwgsc.gc.ca~~ jessie.jutras@TPSGC.GC.CA	

17. Contracting Security Authority / Autorité contractante en matière de sécurité

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature
Anna Kulycka Contract Security Officer, Contract Security Division Anna.Kulycka@tpsgc-pwgsc.gc.ca Tel/Tél: 613-954-4171		

Telephone No. - N° de téléphone / Fax	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
			Feb 12, 2014

Annex D
NON-DISCLOSURE AGREEMENT

I, _____, recognize that in the course of my work as an employee or subcontractor of _____, I may be given access to information by or on behalf of Canada in connection with the Work, pursuant to Contract Serial No _____ between Her Majesty the Queen in right of Canada, represented by the Minister of Public Works and Government Services and _____, including any information that is confidential or proprietary to third parties, and information conceived, developed or produced by the Contractor as part of the Work. For the purposes of this agreement, information includes but is not limited to: any documents, instructions, guidelines, data, material, advice or any other information whether received orally, in printed form, recorded electronically, or otherwise and whether or not labeled as proprietary or sensitive, that is disclosed to a person or that a person becomes aware of during the performance of the Contract.

I agree that I will not reproduce copy, use, divulge, release or disclose, in whole or in part, in whatever way or form any information described above to any person other than a person employed by Canada on a need to know basis. I undertake to safeguard the same and take all necessary and appropriate measures, including those set out in any written or oral instructions issued by Canada, to prevent the disclosure of or access to such information in contravention of this agreement.

I also acknowledge that any information provided to the Contractor by or on behalf of Canada must be used solely for the purpose of the Contract and must remain the property of Canada or a third party, as the case may be.

I agree that the obligation of this agreement will survive the completion of the Contract Serial No:_____

_____
Signature

_____
Date

Annex E

DISCLOSURE CERTIFICATION

In accordance with Article 7.19 (Disclosure Certification) of the contract, you must provide the Contracting Authority and the Project Authority, a disclosure as indicated under Article 28 of General Conditions 2040 (2014-06-26) General Conditions Research and Development.

Please Check the appropriate box and return this Annex “E” with your last claim for progress payment.

_____ We hereby certify that all disclosures were submitted.

_____ We hereby certify that there were no disclosure to submit.

Signature: _____

Date: _____

ATTACHMENT 1 TO PART 2
MANDATORY NON-DISCLOSURE AGREEMENT

MANDATORY NON-DISCLOSURE AGREEMENT (NDA) FOR
[Replacement of Mobile Servicing System Cameras on ISS]

REQUEST FOR PROPOSAL (RFP)

PUBLIC WORKS GOVERNMENT SERVICES CANADA (PWGSC)
FILE # [9F054-13-0905]

BY:

_____, a body corporate duly incorporated under the laws of _____, having its Head Office located at _____;
Hereinafter referred to as the ("Supplier')

TO: HER MAJESTY THE QUEEN IN RIGHT OF CANADA, as represented by the Minister of Public Works and Government Services;
Hereinafter referred to as ("Canada")

The Supplier agrees that, for the purpose of preparing a response to PWGSC for the RFP (the "Purpose") is being giving access to Confidential Information or proprietary to Canada or to third party and agrees to comply with the obligations referred to under this NDA;

1. The Supplier acknowledges that the documents entitled 51612-0003 - Component Envelope, SSRMS, 51602-0517 - MSS Television Camera, SCD, 51602-0518 - Camera HD & Zoom Lens, MSS TVC, ICD, 51612-4012 - CLA Assembly Dwg, 51612-3004 - CLPA Assembly Dwg, 51602-0415 - Camera Control Unit, ICD, 51612-3294 - Light Assembly, SCD, 51612-3233 - Pan & Tilt Unit, SSRMS MBS, SCD, 51612-4968 - TVC Lens Cover Assy, 71512-5000 - FRAME, Lens Cover Assembly, 51612-4968 - Lens Cover Assembly, SSRMS must be treated as confidential and must not be disclosed or used in any way except in relation with the Purpose of this RFP.

2. For the purpose of this NDA, Confidential Information includes, but not limited to the documents entitled 51612-0003 - Component Envelope, SSRMS, 51602-0517 - MSS Television Camera, SCD, 51602-0518 - Camera HD & Zoom Lens, MSS TVC, ICD, 51612-4012 - CLA Assembly Dwg, 51612-3004 - CLPA Assembly Dwg, 51602-0415 - Camera Control Unit, ICD, 51612-3294 - Light Assembly, SCD, 51612-3233 - Pan & Tilt Unit, SSRMS MBS, SCD, 51612-4968 - TVC Lens Cover Assy, 71512-5000 - FRAME, Lens Cover Assembly, 51612-4968 - Lens Cover Assembly, SSRMS and any documents, Instructions, guidelines, data, material, advice or another information whether received orally, in printed form or recorded electronically or otherwise and whether or not labeled as proprietary, that is disclosed to a person or entity or that person or entity becomes aware of for the purpose of this RFP.

3. The Supplier agrees that the documents entitled 51612-0003 - Component Envelope, SSRMS, 51602-0517 - MSS Television Camera, SCD, 51602-0518 - Camera HD & Zoom Lens, MSS TVC, ICD, 51612-4012 - CLA Assembly Dwg, 51612-3004 - CLPA Assembly Dwg, 51602-0415 - Camera Control Unit, ICD, 51612-3294 - Light Assembly,

SCD, 51612-3233 - Pan & Tilt Unit, SSRMS MBS, SCD, 51612-4968 - TVC Lens Cover Assy, 71512-5000 - FRAME, Lens Cover Assembly, 51612-4968 - Lens Cover Assembly, SSRMS will not be reproduced, copied, divulged, released or disclosed, in whole or in part, in whatever way or form any Confidential Information to any person or entity other than a person employed by the Supplier without the prior written consent of the PWGSC's Contracting Authority and for any purpose other than for the preparation of a response to this RFP.

4. The Supplier agrees to immediately notify the PWGSC's Contracting Authority if any person, other than the Supplier's current employees accesses the Confidential Information at any time.

5. Also, regardless of whether it is Confidential Information, the Supplier must at all times treat the information designated as Confidential Information and ensure it cannot be accessed by anyone excepting the Supplier's current employees, which have a legitimate "need to know' for the Purpose of presenting a RFP.

6. The Supplier shall at all times use the same degree of care as it uses to protect its own confidential information of like importance to prevent the unauthorized use or disclosure of Confidential Information, but in no event less than a reasonable degree of care. The Supplier shall not, nor shall it permit its employees to, remove any copyright, confidential, proprietary rights, or intellectual property notices attached to or included in any Confidential Information and shall reproduce all such notices on any copies of the Confidential Information.

7. The Supplier is responsible for any breach of this NDA by any of its employees, and the Supplier shall not, nor shall permit its employees to, modify, disassemble, decompile, or reverse engineer any Confidential Information even if it relates to the Purpose.

8. All the Information contained in the document entitled 51612-0003 - Component Envelope, SSRMS, 51602-0517 - MSS Television Camera, SCD, 51602-0518 - Camera HD & Zoom Lens, MSS TVC, ICD, 51612-4012 - CLA Assembly Dwg, 51612-3004 - CLPA Assembly Dwg, 51602-0415 - Camera Control Unit, ICD, 51612-3294 - Light Assembly, SCD, 51612-3233 - Pan & Tilt Unit, SSRMS MBS, SCD, 51612-4968 - TVC Lens Cover Assy, 71512-5000 - FRAME, Lens Cover Assembly, 51612-4968 - Lens Cover Assembly, SSRMS and all other Confidential Information disclosed under this NDA shall remain the property of Canada or a third party, or of any other person or entity to whom it lawfully belongs, as applicable.

9. Without restricting the generality of the foregoing, the Supplier recognizes that no license or conveyance of any rights to the Supplier under any discoveries, inventions, patents, trade secrets, copyrights, or other form of intellectual property is granted or implied by the disclosure of Confidential Information under this NDA.

10. The Supplier must require any proposed subcontractor with a "need to know", to execute a NDA on the same conditions as those contained in this NDA prior to disclosure of the Confidential Information.

11. All Confidential Information will remain the property of Canada and must be returned to the Contracting Authority within thirty (30) days following that request.

12. The NDA remains in force indefinitely.

13. Nothing in this NDA should be construed as preventing the disclosure or use of any confidential information to the extent that such information:

    (a) is or becomes in the public domain through no fault of the Supplier or any proposed subcontractor;

    (b) is or becomes known to the Supplier from a source other than Canada, except any source that is known to the Supplier to be under an obligation to Canada not to disclose the information; or

    (c) is disclosed under compulsion of a legislative requirement or any order of a Court or other tribunal having jurisdiction.

14. The Supplier agrees that a breach of this NDA may result in disqualification of a Supplier or a Qualified Supplier at any time, or immediate termination of the resulting Contract. The Qualified Respondent also acknowledges that a breach of this NDA may result in a review of the Qualified Supplier's security clearance and review of the Qualified Supplier's status as an eligible Supplier for other requirements.

15. The Supplier acknowledges and agrees that it will be liable for any and all claims, loss, damages, costs, or expenses incurred or suffered by Canada caused by the failure of the Supplier, or by anyone to whom the Supplier discloses the Confidential Information to comply with these conditions.

IN WITNESS WHEREOF, this Non-Disclosure Agreement has been duly signed this

day of , 2014, by an authorized representative of the

_____
Name of Supplier

_____
Name of authorized representative (print)

_____
Signature
(I have authority to bind the corporation)
Signed by its authorized representative

Witness:

_____
Name of the Witness

ATTACHMENT 1 TO PART 3
TECHNICAL AND MANAGERIAL BID PREPARATION INSTRUCTIONS

1.1 TECHNICAL AND MANAGERIAL BID

The details provided in this Attachment complement the information introduced in Part 3 - Bid Preparation Instructions.

The Bidder should present the information about the Technical and Managerial Bid in the following order:

1. Title / Project Identification Page (see 1.2);
2. Executive Summary (see 1.3);
3. Table of Contents (see 1.4);
4. Technical and Managerial Section (see 1.5);
5. Bid Appendices (see 1.6).

The structure of the Technical and Managerial Bid and its subsections are described below. Some of the subsection headings include identifiers. These identifiers represent an evaluation criterion (see Attachment 1 to Part 4) that is applicable to that specific section/subsection for each bid submitted by a Bidder.

1.2 Title/Project Identification Page

The first page of the bid submitted should state the following information:

a) The Request for Proposal file number;
b) The company's name and address;
c) The title of the proposed Work (the use of acronyms in the title is discouraged, unless they are described).

1.3 Executive Summary

The Bidder must provide an Executive Summary. The Executive Summary is a stand-alone document suitable for public dissemination, for example, through the CSA web site. The Executive Summary should not exceed two pages in length (8.5” x 11”) and should highlight the following elements:

a) Work objectives;
b) Technical and programmatic risks;
c) Major milestones and deliverables.

1.4 Table of Contents

The table of contents should be formatted such that its headings are linked to their respective location in the bid for ease of reference when using the bid's Soft copy version.

1.5 Technical and Managerial Section

The Technical and Managerial Section should describe the technical and Managerial aspects of the project as outlined in the following subsections.

1.5.1 Mandatory Evaluation Criteria

The Bidder must have a subsection in its bid for each mandatory evaluation criterion detailed in Attachment 1 to Part 4, by focusing on providing details pertaining to the information contained in the description of each evaluation criterion.

1.5.2 Point-Rated Criteria

The Bidder must have a subsection in its bid for each rated evaluation criterion detailed in Attachment 1 to Part 4, by focusing on providing details pertaining to the information contained in the description of each evaluation criterion.

1.6 Bid Appendices

1.6.1 Appendices Required with the Bid

The following items should be addressed in individual appendices as part of the bid:

a) List of Acronyms: All the acronyms used in Section I: Technical and managerial Bid, should be explained;

b) Resumes: The bid should include resumes of the proposed resources and these should be appended to Section I: Technical and Managerial Bid;

c) List of Contacts: The list of contacts should be appended to Section I: Technical and Managerial Bid, in a format suitable for distribution and should include all the Bidder's points-of-contact involved in the bid development and/or during the Contract.

The following example format should be used:

Table 1.6: Bidder's List of Contacts

Role	Name	Telephone	Fax	E-Mail
Project Manager				
Project Engineers				
Contractor's Representative				
Claims (Invoicing) Officer				
Communications (for press release)				
Other				

ATTACHMENT 1 TO PART 4
Evaluation Criteria

1. Mandatory criteria

These criteria are deemed mandatory by CSA as the minimum necessary competence and capability for undertaking the work. Mandatory requirements are evaluated on a pass or fail basis and they will be evaluated very strictly as to compliancy. Therefore, no rating is associated with them. Proposals not meeting all mandatory criteria will be deemed non-responsive.

Bidder Experience

Except where expressly provided otherwise, the experience described in the bid must be the experience of one or more of the following:

1. The Bidder itself (which includes the experience of any companies that formed the Bidder by way of a merger but does not include any experience acquired through a purchase of assets or an assignment of contract); or

2. The Bidder's affiliates (i.e. parent, subsidiary or sister corporations), provided the Bidder identifies and demonstrates the transfer of know-how, the use of toolsets and the use of key personnel from the affiliate for the applicable criterion; or

3. The Bidder's subcontractors provided the Bidder includes a copy of the teaming agreements and identifies the roles and responsibilities of all parties under the agreement and how their work will be integrated.

The experience of the Bidder's suppliers will not be considered.

M1:

a. The Bidder must have demonstrated experience in design, manufacture and test of systems and software rated for operations in a human space flight program (examples include Space Shuttle, International Space Station programs) in all fields/area listed hereunder.

b. The Bidder must have demonstrated project management experience in the delivery of activities described in (a).

This criterion assesses the Bidder's experience and expertise in similar projects and how the Bidder has been active in the business related to the technology being procured. The Bidder must provide a description of previous, or current, similar or related projects along with references to demonstrate that the projects are similar or related to the Work. The projects have to be advanced enough to demonstrate that the design, manufacturing and testing phases are completed.

The key technical fields necessary to perform the Work include the following disciplines, in which the Bidder must demonstrate that it has a level of experience and expertise:

- Optics
- Image sensors
- Light assemblies
- FPGA programming (software, firmware)

In addition, the Bidder must demonstrate that it has experience in projects involving the following areas, or areas of similar complexity:

- Telemetry
- Camera and light design and delivery (for intended environment)

- NASA Safety requirements for ISS

In describing previous experience in similar or related projects, the Bidder must describe how it met the established schedule and budget in the delivery of the project.

M2: The bidder must be ISO 9001 certified as demonstrated by a valid certificate.

The certificate must be valid for the duration of the contract. If expiry of the certificate is within the period of the contract, the Bidder must demonstrate or provide a statement that it will be renewed.

***M3: The Bidder must demonstrate that the proposed camera and light solution will meet all mandatory system requirements provided in document* CSA-SS-SG-0061.**

The Bidder must provide a compliance statement as well as compliance detailed substantiation, the reference in its proposal or the intent to comply for each mandatory requirement identified in Table 1- RCAM Systems Requirements for Evaluation provided with document CSA-SS-SG-0061 upon request.
The definitions of "detailed substantiation", "reference in proposal" and "intend to comply" are available hereunder.

***M4: The Bidder must demonstrate that the proposed camera and light solution will meet all mandatory product assurance requirements provided in document* CSA-RCAM-RD-0001.**

The Bidder must provide a compliance statement as well as compliance detailed substantiation, the reference in the proposal or the intent to comply for each mandatory requirement identified in Table 2 - MSS RCAM PAR Requirements for Evaluation provided with document CSA-RCAM-RD-0001 upon request. The definitions of "detailed substantiation" and "reference in proposal" and "intend to comply" are available hereunder.

In order to be responsive, Bidders must provide the requested level of details indicated in Table 1- RCAM Mandatory Systems Requirements for Evaluation and and Table 2 - MSS RCAM PAR Requirements for Evaluation, for each listed requirement. Please find below the definitions of the requested levels.

Detailed substantiation (DET SUBST)

When a detailed substantiation is required, Bidders are requested to provide a detailed statement of how it complies with the requirements. Cross-references to appropriate sections of the proposal should be provided when applicable and the essence of the referenced information should be summarized in the substantiation.

Reference in proposal to the compliance statement (REF PROP)

When a reference in the proposal to the compliance statement is required, the bidder must include cross references to appropriate sections of their proposal where the compliance to the requirement is stated.

Intent to comply (IC)

Bidders must confirm they will comply with the mandatory requirement. As the mandatory requirement will be a requirement of the Contract, any failure to comply with the requirement of the Contract will result in the Contractor being in Default.

M5: The Bidder must meet the duration requirement in the Statement of Work. From start of contract to delivery of Flight Models, duration is 28 months with a maximum of 30 months of continuous work.

This criterion assesses if the schedule provided in the Bidder's proposal is feasible and realistic (activity durations and activity flow are feasible, level of details in the project schedule is adequate, adequate margins are identified). The project schedule must be detailed, well substantiated, realistic and demonstrate that the Bidder can meet the target duration.

The Bidders must provide a project timetable that sets out tasks, milestones and deliverables. A Gantt chart and/or PERT chart should be used to illustrate the schedule. The bidder must describe the processes planned to be used to ensure timely completion of the project's milestones and this description must include activity definition, activity sequencing, estimate of activity duration, dependencies and schedule control. For planning purposes, use a project start date of July 1st, 2015.

2. Point-rated Criteria

Proposals must achieve the stated minimum points required for each rated criterion to be assessed as responsive under the point rated technical criteria section; proposals not meeting the minimum required points will be deemed non-responsive. Only those proposals which are responsive (compliant) with all of the mandatory criteria and then achieve (or exceed) the stated minimum points required for the point rated technical criteria section will be further considered for award of a contract.

For the following criteria, when a detailed substantiation is required, Bidders are requested to provide a detailed statement of how it complies with the requirements. Cross-references to appropriate sections of the proposal should be provided when applicable and the essence of the referenced information should be summarized in the substantiation.

R1: Understanding of the System Underlying Principle (10 points)

This criterion assesses the degree to which the Bidder understands the system underlying technical principles through the description of the design proposed. The proposed design must be commensurate with the two fundamental objectives of the project; programmatic requirements (schedule) and operational/functional/product assurance requirements. : The Bidder must demonstrate that it understands the three main requirements of the project and that they are in line with the two fundamental objectives described in the SOW. The three main requirements of the project are:

- replace existing and operationally critical camera/light kits with new camera/light kits having the same functions without enhancements other than those offered inherently with today's technologies (e.g. power consumption, volume, computing power),
- interface with existing MSS infrastructure, and
- operate under the safety critical conditions of International Space Station. .

Level A (10 pts)
The Bidder's description of the design adequately demonstrates an understanding of the system technical principles commensurate with the two fundamental objectives of the project AND the proposed design is tied, with a detailed substantiation, to all three (3) project needs.

Level B (5 pts) (minimum required)
The Bidder's description of the design adequately demonstrates an understanding of the system technical principles commensurate with the two fundamental objectives of the project AND the proposed design is tied, with a detailed substantiation, to two out of the three project needs.

Level C (0 pts)
No design is proposed OR the proposed design is not relevant to the project OR the proposed design is not commensurate with at least one of the fundamental objectives OR the proposed design lacks detailed substantiation for at least two requirements of the project.

The Bidder must provide a Project Management Plan (PMP), Work Breakdown Structure (WBS), according to the SOW CDRL requirements. Notwithstanding the Bidder's proposal, contents of these will be used to evaluate R2, R3, and R4.

R2: Project Management Plan (PMP) (10 points)

This criterion assesses if the Project Management Plan (PMP) and Work Breakdown Structure (WBS) provided in the Bidder's proposal are credible (sufficient resources are allocated for the project, assumptions are substantiated, control gate mechanisms are defined and mitigation approaches are provided). This criterion also assesses the PMP's effectiveness in directing the contract to a successful completion.

This criterion evaluates the Project Management Plan and Work Breakdown Structure for its completeness and assesses its effectiveness in directing the project to a successful completion. The Project Management Plan's presentation must be based on the recognized management tools most relevant to the proposed project, such as a scope planning (Work Breakdown Structure), and schedule development charts (Gantt, Program Evaluation and Review Technique PERT, etc.) Equivalent Bidder developed, project tailored tools/charts are also acceptable, provided that the information is complete and comprehensive.

The Project Management Plan must set out the scope of Work to be executed according to the requirements of the SOW (Annex A). For this criterion, the PMP should also take into consideration the following 5 areas:

(1) Project Integration Management,
(2) Project Scope Management,
(3) Project Quality Management,
(4) Project Communications Management and
(5) Project Procurement Management.

Elements (qty: 21) of these areas are described in the SOW CDRL-PM-01. The Bidder should also demonstrate how the WBS organizes and defines the total work scope of the project, per SOW CDRL-PM-02 for the following three elements:

(1) work package scope,
(2) required inputs/dependencies,
(3) Activity description.

Level A (10 pts)
The PMP provided by the Bidder is as per the description of the evaluation criterion with detailed substantiation for all 5 areas, including their elements AND the WBS provided is also as per the description of the evaluation criterion with detailed substantiation for all three elements.

Level B (minimum required) (5pts)
The PMP provided by the Bidder is as per the description of the evaluation criterion with detailed substantiation for 4 of the 5 areas, and for 75% of elements of each area AND the WBS provided is also as per the description of the evaluation criterion with detailed substantiation for two of the three elements.

Level 0 (0 pts)
Either the PMP or WBS was not provided or the PMP or WBS that the Bidder provided is not relevant to the project or the PMP that the Bidder provided has substantiation for less than 4 of the 5 areas or the WBS provided has substantiation for less than 2 out of the 3 elements.

R3: Risk Management (20 points)

This criterion assesses how the Bidder is able to identify and manage project risks. It also evaluates the effectiveness of the described methodology in resolving the project challenges and in successfully attaining the fundamental objectives of the work stated in Criterion R1.

The Bidder should provide an assessment of the technical and programmatic risks/uncertainties involved as well as the major assumptions upon which the Work is based. The risks should be identified and a Risk Mitigation Plan, including contingency plans, alternatives or other means of limiting adverse impacts of risks being realized, should be provided. The Bidder should describe the processes planned to be used to identify, analyze and respond to project risks, according to CDRL-PM-02, Risk Management section of the PMP. It should address the following five elements:

(1) Risk Identification,
(2) Risk Quantification (probability-likelihood/consequence-impact),
(3) Risk Response Development,
(4) Risk Response Control,
(5) Project Risk Assessment.

As a guideline, Table 1.4 and Table 1.5 present fictitious examples of Project Risk Assessment Matrices, while Table 1.6 presents an example of a Project Risk Profile Matrix. The Bidder may use its own format as long as the 5 elements are represented.

Table 1.4: Example of a Risk Assessment Matrix

Risk Event 1	Limited availability of key documents
Probability	Low 1/20 Past experience demonstrates important number of different sources for patents and articles covering this subject.

Consequence to project	Low	$5 000 - $10 000 Cost growth Schedule delays
Risk Assessment	Low	$250 - $500 (R < 5% of overall project value, $250K)
Mitigation Plan	Secure at least 2 sources for each type of document	
Contingency Plan	Use second source	

Table 1.5: Example of a Risk Assessment Matrix

Risk Event 2	**Late delivery of test equipment**	
Probability	High 1/3 Past experience with provider demonstrated poor respect of schedule.	
Consequence to project	High	$110 000 (cost of securing optional test facility) Significant cost growth Significant schedule delays
Risk Assessment	High	$55 000 High (R > 25% of overall project value)
Mitigation Plan	Identify and secure equivalent equipment in immediate geographical region Ensure equipment will be available for needed timeframe Memo of understanding with facility key managers	
Response Plan	Secure equipment with MOU Confirm timeframe options with facility	

Table 1.6: Project Risk Profile Matrix

Probability	High			R2
	Medium			
	Low	R1		
		Low	Medium	High
		Consequence		

Level A (20 pts)
The Risk Management Plan part of the PMP is as per the description of the evaluation criterion with detailed substantiation for all five elements for each identified risk.

Level B (10 pts) minimum required
The Risk Management Plan part of the PMP is as per the description of the evaluation criterion with detailed substantiation for at least 4 of the 5 elements for each identified risk.

Level C (0 pts)
Either the Risk Management Plan part of the PMP was not provided or the Risk Management Plan part of the PMP is not relevant to the project or the Risk Management Plan part of the PMP has detailed substantiation for less than 4 of the 5 elements for each identified risk.

R4: Team Expertise and Experience (10 points)

This criterion assesses the capability (education, knowledge, experience, expertise and complementarities) of the key resources, including subcontractors, identified to carry out the Work. The bidder should demonstrate that the skills of the team include those necessary to lead teams resident in different partner locations and through different project phases (such as requirements analysis, design, manufacturing, testing). Key technical fields and areas necessary to perform the Work are identified in Mandatory criterion M1

The Bidder must identify his Project Manager and outline his/her qualifications. The Bidder's proposed Project Manager must have been a Project Leader on a minimum of three (3) projects OR have a minimum of 5 years (60 months) of demonstrated Project Management experience. The demonstrated experience must be in design, manufacture and test of systems and software rated for operations in a human space flight program (examples include Space Shuttle, International Space Station programs).

The Bidder must identify the key members of the projects' technical and management teams and state their specific qualifications and experience for the work involved. The Bidder's proposed team must have a combined experience in all technical fields and areas identified in criterion M1.Detailed resumes must be provided in an Appendix. Names of back up personnel for key positions should also be included. The Bidder should include an organizational chart that illustrates the structure of the proposed project team.

Also, this criterion assesses the combined technical capability and experience of the team assembled to carry out the Work. The Bidder must demonstrate capabilities and experience in developing technologies and engineering development or similar technology detailed in Annex A. This must be demonstrated through examples of past projects, clearly identifying the technologies

and engineering methods that were developed, and their similarities to the technologies required in the RFP, as well as the level of complexity involved, in line with the requirements of this RFP.

The Bidder should address the following 4 elements:

(1) Qualifications and experience of each resource on the team,
(2) Project Organizational chart,
(3) Key personnel and subcontractors (the latter, if subcontractors are proposed),
(4) Backup personnel, qualifications/experience, and planning.

In the circumstances where sub contractors resources are being proposed, the same requirements applicable to the prime contractor are applicable to the sub contractor's team(s).

Level A (10 pts)
Project Manager has been a Project Leader on a minimum of three (3) projects OR have a minimum of 5 years (60 months) of demonstrated Project Management (The demonstrated experience must be in design, manufacture and test of systems and software rated for operations in a human space flight program (examples include Space Shuttle, International Space Station programs)) AND the Bidders' proposed team has experience in all technical fields and areas identified in M1 AND detailed substantiation is provided for all 4 elements.

Level B (minimum required) (5pts)
The Project Manager has a minimum of 5 years (60 months) of demonstrated Project Management experience OR has been the Project Leader on a minimum of three (3) projects AND The Bidders' proposed team has experience in all technical fields and areas identified in M1 AND detailed substantiation is provided for 3 of the 4 elements.

Level C (0 pts)
The Project manager does not have the minimum required experience or the Bidder has not provided any Team Expertise and Experience or the Team Expertise and Experience provided by the Bidder is not relevant to the project or the Team Expertise and Experience has detailed substantiation for less than 3 of the 4 elements.

The Bidder must provide a System Engineering Management Plan (SEMP), Software Development Plan (SDP) and Product Assurance Implementation Plan (PAIP) according to the SOW CDRL requirements (SOW CDRL-SE-01, SOW CDRL-SW-01 and SOW CDRL-PA-01). Further, as part of the SEMP or separately, the Bidder must provide a Technology Readiness and Risk Assessment for critical technology elements and a mitigation plan. Notwithstanding the Bidder's proposal, contents of these will be used to evaluate R5.

R5: Technical Methodology (20 points)

This criterion assesses the suggested technical methodology and its correlation with the work plan as presented in the proposal. It also evaluates the effectiveness of the described methodology in resolving the technical challenges, in attaining the stated technical objectives of the work, and in meeting technical requirements of CSA-SS-SG-0061 System Specification for Mobile Servicing System (MSS) Replacement Camera and Lights and the product assurance requirements of CSA-RCAM-RD-0001 MSS Replacement Camera Product Assurance Requirements.

For this criterion, the Bidder must provide an overview of the technical methodology that it proposes to use. The methodology proposed must describe how the Work would be conducted through the use of analytical methods, procedures, techniques, industry standards, best practices

and the state of the art for pertinent disciplines, such as “value engineering”. The methodology must clearly demonstrate how TRL (Technology Readiness Level) for particular key technology will be increased. The methodology and the Bidder’s work plan must take into consideration the Technology Readiness & Risk Assessment/Analysis. The Bidder must also indicate which software development environment and methodology are already in place (e.g. use of CASE tools, standards, quality assurance, etc.)

The Bidder must also elaborate on and substantiate the proposed methodology while making references to the main activities described in the Bidder’s bid and in the Bidder’s Work Breakdown Structure (WBS).

The Bidder should address the following elements from the System Engineering Management Plan:

(1) Design and Development Plan,
(2) Interaction with the Integrator,
(3) Interface Management (hardware/software),
(4) Technical Performance Measures and Margin Philosophy,
(5) Environmental Engineering

The Bidder should address the following elements from the Software Development Plan:

(1) Software Qualification process,
(2) Traceability (from requirements to design),
(3) Performance parameter estimation and control.

The Bidder should address the following elements from the PAIP:

(1) Qualification Program,
(2) EEE Parts Program,
(3) Reliability,
(4) Software Product Assurance

The Bidder should address Technology Risk Assessment/Analysis:

(1) Critical Technology Element identification,
(2) Critical Technology Element technical maturity,
(3) Critical Technology Element technical risk and mitigation,
(4) Critical Technology Element development to increase maturity

Level A (20 pts)
The Technical Methodology is as per the description of the evaluation criterion with detailed substantiation for all above mentioned elements.

Level B (minimum required) (10 pts)
The Technical Methodology addresses all of the above mentioned elements as per the description of the evaluation criterion with detailed substantiation for 4 of the 5 SEMP elements, 2 of the 3 SDP elements, 3 of the 4 PAIP elements, and 3 of 4 TRRA elements.

Level C (0 pts)
The Bidder did not provide any Technical Methodology or the Technical Methodology provided is not relevant to the work or the Technical Methodology has detailed substantiation in one of the following manners: less than 4 of the 5 SEMP elements; less than 2 of the 3 SDP elements; less than 3 of the 4 PAIP elements; less than 3 of the 4 TRRA elements.

ATTACHMENT 1 TO PART 5
FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - CERTIFICATION

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

For further information on the Federal Contractors Program for Employment Equity visit Employment and Social Development Canada (ESDC)-Labour's website.

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

Complete both A and B.

A. Check only one of the following:

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

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

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

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

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

and

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

OR

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

B. Check only one of the following:

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

OR

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