Geostationary Operational Environmental Satellite (GOES)

GOES-R Series

SPACECRAFT STATEMENT OF WORK (SOW)

January 23, 2008

National Aeronautics and Space Administration

Goddard Space Flight Center
Greenbelt, Maryland

/Spacecraft

Spacecraft SOW

417-R-SCSOW-0013, RM Version, GOES-R Flight Project Spacecraft Statement of Work (SOW)

Version: 2.1 (1_23_08)
Printed by: dharrison
Printed on: Wednesday, January 23, 2008

No filter applied.

No sort applied.

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1 Introduction

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The National Oceanic and Atmospheric Administration (NOAA) operates a system of Geostationary Operational Environmental Satellites (GOES) to provide continuous weather imagery and monitoring of meteorological and space environment data to protect life and property across the United States. Two GOES satellites remain operational at all times providing coverage for the eastern United States and most of the Atlantic Ocean and the western United States and Pacific Ocean basin. An on-orbit spare satellite is maintained to permit rapid recovery from a failure of either of the operational satellites. GOES satellites provide critical atmospheric, oceanic, climatic and space weather products supporting weather forecasting and warnings, climatologic analyses and prediction, ecosystems management, and safe and efficient public and private transportation. The GOES satellites also provide a platform for solar and space environmental observations. Auxiliary Communications Services are provided for GOES data rebroadcast, data collection platform relay, low resolution imagery, emergency weather communications, and satellite aided search and rescue. GOES supports all of the Mission Goals and links to the NOAA Strategic Plan and NESDIS Concept of Operations.

The GOES program currently consists of three series of satellites. The GOES-I/M series (8-12) is the current operational series. Transition to the GOES-N/P series spacecraft bus has commenced with the successful launch of GOES-13 in 2006. The GOES-I/M and -N/P series share the same generation primary instrument payload. The GOES-R series represents a generational change in both spacecraft and instrument capability, with initial launch capability in late 2014. GOES-R is a collaborative development and acquisition effort between NOAA and the National Aeronautics and Space Administration (NASA). The acquisition of the end-to-end GOES-R system includes spacecraft (Spacecraft Bus, Auxiliary Communications Services, and Magnetometer), GFP instruments, launch services, and all associated ground segment elements.

Program activities occur at NESDIS Headquarters and the NASA Goddard Space Flight Center (GSFC). Additional information can be found at the following URL: http://www.nesdis.noaa.gov, and http://www.osd.noaa.gov.

SCSOW3 1.1

1.1 Goals and Objectives

SCSOW4 1.1.0-1

One of NOAA's principal missions is to provide forecasts and warnings for the United States, its territories, adjacent waters and ocean area for the protection of life and property and enhancement of the national economy. This mission requires the capability to acquire, process, and disseminate environmental data on an extensive spatial range (global, regional and local) on a variety of time scales. These data include, but are not limited to: global imagery; cloud and precipitation parameters; atmospheric profiles of temperature, moisture, winds, aerosols, and ozone; surface conditions concerning ice, snow and vegetation; ocean parameters and sea-surface temperature; and solar and in-situ space environment conditions.

The Government is procuring the next-generation GOES series to continue its mission through new requirements specified in the GOES-R Level I Requirements Document and Mission Requirements Document (MRD). The first satellite of this new series, designated as GOES-R, will provide the first major improvement in instrument technology since GOES-I launched in 1994. The GOES-R series will introduce other new technologies in both the Space and Ground Segments. These advances will improve the nation's ability to monitor and forecast weather and environmental phenomena with a significant increase in the number of products.

SCSOW5 1.2

1.2 Mission Overview

SCSOW6 1.2.0-1

GOES-R series satellites will have two operational locations; 75 degrees west and 137 degrees west longitude. Any GOES-R series satellite stored on-orbit will be located at 105 degrees W. The primary instrument is the Advanced Baseline Imager (ABI) that will provide hemispheric, synoptic, and mesoscale imagery for global and CONUS forecasting and severe weather warning. Secondary instruments include the Extreme ultraviolet and X-ray Irradiance Sensor (EXIS), Solar

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SCSOW6	1.2.0-1	Ultraviolet Imager (SUVI), Space Environment In-Situ Suite (SEISS), Magnetometer (MAG), and Geostationary Lightning Mapper (GLM). Additionally, GOES-R series satellites will provide a set of Auxiliary Communications Services in support of the Data Collection System (DCS), Emergency Managers Weather Information Network and Low-Rate Information Transmission (EMWIN/LRIT), and Search-and-Rescue Satellite Aided Tracking (SARSAT).
SCSOW7	1.3	**1.3 Scope**
SCSOW8	1.3.0-1	This Statement of Work (SOW) defines those tasks to design, analyze, validate, develop, fabricate, assemble, integrate, test, verify, evaluate, deliver GOES-R series satellites and support launch and post launch, supply and maintain the Ground Support Equipment (GSE), and support the NOAA Satellite Operations Control Center (SOCC).
SCSOW1112	1.3.0-2	The Contractor **shall** provide the personnel, materials, facilities, and other resources to design, validate, fabricate, assemble, integrate, test, verify, and deliver GOES-R series satellites and provide pre-launch, launch, and post-launch support and training under the basic contract, and options when exercised by the Government.
SCSOW9	1.3.0-3	The Contractor **shall** provide all data and documentation deliverables in accordance with GOES-R Series Contract Data Requirements List (CDRL) 417-R-SCCDRL-0015.
SCSOW10	1.4	**1.4 Applicable Documents**
SCSOW11	1.4.0-1	1. 417-R-SCCDRL-0015; GOES-R Series Contract Data Requirements List (CDRL) 2. 417-R-PSPEC-0014: GOES-R Spacecraft Functional and Performance Specification (F&PS) 3. 417-R-SCWBS-0060; GOES-R Series, Flight Project, Spacecraft, Work Breakdown Structure (WBS) Dictionary 4. 417-R-RAD-0061; GOES-R Series, Project Resource Allocation Document (PRAD) 5. 417-R-SCMAR-0011; GOES-R Spacecraft Mission Assurance Requirements (SCMAR) 6. GSFC-STD-1001; Criteria for Flight Project Critical Milestone Reviews 7. P417-R-LIST-0142; GOES R Acronym and Glossary Dictionary 8. NPR 7123.1A; NASA Systems Engineering Processes and Requirements 9. AFSPCMAN 91-710; AIR FORCE SPACE COMMAND MANUAL 91-710, VOLUME 2, 1 JULY 2004 RANGE SAFETY USER REQUIREMENTS MANUAL VOLUME 2 - FLIGHT SAFETY REQUIREMENTS 10. NASA-STD-8719.13B; NASA Software Safety Technical Standard 11. NASA-STD-8739.8; NASA Software Assurance Standard 12. ISO 14644-1; Classification for Air Cleanliness 13. GPR 8700.6A Engineering Peer Reviews
SCSOW12	1.5	**1.5 Reference Documents**
SCSOW13	1.5.0-1	1. P417-R-CONOPS-0008; GOES-R Concept of Operations (CONOPS) 2. P417-R-PLN-0156: GOES-R Test Strategy Document 3. P417-R-PLN-0083; GOES-R Test and Evaluation Master Plan (TEMP) 4. P417-R-PLN-0052**;** GOES-R System Review Plan (SRP)

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SCSOW13	1.5.0-1	5. GSFC 500 PG-8700.2.7; Design of Space Flight Field Programmable Gate Arrays 6. GSFC 500-PG-8700.2.8; FPGA Development Methodology 7. GSFC-STD-7000; GENERAL ENVIRONMENTAL VERIFICATION STANDARD (GEVS) For GSFC Flight Programs and Projects. April 2005 8. GSFC-STD-1000; Rules for the Design, Development, Verification, and Operation of Flight Systems Revision C.2 - December 12, 2006 9. NASA NPR 7120.5D; NASA Space Flight Program and Project Management Requirements. March 6, 2007 10. NASA NPR 8000.4; Risk Management Procedural Requirements (Revalidated 2/1/07) 11. NASA NPR 7150.2; NASA Software Engineering Requirements 12. P417-R-SCHED-0082; GOES-R Integrated Master Schedule (IMS) 13. P417-R-PLN-0022; GOES-R Risk Management Plan
SCSOW14	1.6	**1.6 Requirements**
SCSOW15	1.6.0-1	The term "**shall"** designates a requirement. The terms "will**"** and "is" designate statements of fact or intentions of the Government and are not to be interpreted as Contractor requirements. The term "should" designates a desired level of performance the Government would like the Contractor to strive towards achieving. The term "(**TBD**)" means, "To be determined". This is applied to requirements or values that have not been defined.
SCSOW16	1.6.0-2	The Contractor **shall** propose a requirement or value and provide a rationale for all TBD requirements.
SCSOW17	1.6.0-3	The Contractor **shall** coordinate all TBD requirement proposals with the Government and other contractors.
SCSOW18	1.6.0-4	The Contractor **shall** request and obtain approval from the Government before proceeding with implementation of the proposed TBD value.
SCSOW19	1.6.0-5	The term "(**TBR**)**"** means, "To be reviewed". This is applied to requirements or values that are subject to review by the Government and the Contractor. The Contractor **shall** review and suggests a modified value and rationale for all TBR requirements. The "TBR" provides an indication that the value may change upon review.
SCSOW20	1.6.0-6	The Contractor **shall** coordinate all TBR requirement proposals with the Government and other contractors.
SCSOW21	1.6.0-7	The Contractor **shall** request and obtain approval from the Government before proceeding with implementation of the proposed TBR value.
SCSOW22	1.6.0-8	The term "(**TBS**)"means, "To be supplied. The Government will supply TBS data or details. The Government will provide a date or milestone to resolve each TBS requirement.
SCSOW23	1.6.0-9	The term "Government" **shall** be defined as Government personnel and Government support contractor personnel.

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SCSOW24	2	# 2 Spacecraft #1
SCSOW25	2.0-1	The Contractor **shall** develop and deliver a spacecraft bus, spacecraft, and satellite designated as GOES-R.
SCSOW26	2.0-2	The effort **shall** include design, analyses, validation, fabrication, assembly, test, verification, maintenance, storage, delivery and post-acceptance support through the life of the mission.
SCSOW27	2.1	## 2.1 Program Management
SCSOW28	2.1.0-1	The Contractor **shall** perform the direct management functions and provide a management structure responsible for overall project control to assure that all requirements of this contract and all attachments are accomplished within cost and on schedule.
SCSOW29	2.1.1	### 2.1.1 Program Management Office
SCSOW31	2.1.1.0-1	The Contractor **shall** establish a Program Management Office (PMO) responsible for the leadership and overall direction of all phases of the work specified in this SOW.
SCSOW32	2.1.1.0-2	The Contractor **shall** provide a full-time Program Manager through the acceptance of the final satellite.
SCSOW33	2.1.1.0-3	The Program Manager **shall** have corporate authority to assure that the contract cost, schedule and technical requirements are fully met.
SCSOW34	2.1.1.0-4	The Contractor **shall** initiate communication with the Government through the Contracting Officer's Technical Representative (COTR) that includes, but is not limited to, e-mail and telephone contact, weekly telecons with the Government team, and one-on-one contact between the Government and Contractor discipline engineers, to be coordinated by the COTR. The Government will provide a list of project personnel authorized to communicate with the Contractor.
SCSOW35	2.1.1.0-5	The Contractor **shall** establish and maintain a Subcontract Management and Control System which provides technical direction and sub-contract management to ensure performance, cost, and schedule requirements are accomplished.
SCSOW37	2.1.1.0-6	The Contractor **shall** upload the MAID to the GOES-R Flight Project Government Portal (referred to as "Portal" hereafter) and send notification to the NASA document manager and COTR.
SCSOW38	2.1.1.0-7	The Contractor **shall** provide access to the MAID through a Contractor provided secure web site that is available to the Government at all times.
SCSOW40	2.1.1.0-8	The Contractor **shall** retain all documents and test data for a minimum of 6 years after contract completion and deliver a copy to the COTR.
SCSOW41	2.1.1.0-9	The Contractor **shall** plan for and implement team building and training activities with the Government in conjunction with reviews and meetings.
SCSOW42	2.1.1.0-10	The Contractor **shall** establish Working Groups for the resolution of issues and to facilitate Integration and Test (I&T) planning activities at the Government's request.
SCSOW43	2.1.1.0-11	The Contractor **shall** prepare a working group specific Data Package, in a Contractor defined format, and provide that package to the Government no later than 5 business days before the working group meets.
SCSOW44	2.1.1.0-12	The Contractor **shall** establish a charter for each working group which specifies the group's objective, membership, and meeting schedule.

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SCSOW45	2.1.1.0-13	The Contractor **shall** dissolve Working Groups once the objective of the group has been accomplished to the satisfaction of the Government.
SCSOW47	2.1.2	**2.1.2 Resource Management**
SCSOW48	2.1.2.0-1	The Contractor **shall** establish, implement and maintain a Resources Management System (RMS) for planning, authorizing, analyzing, and controlling the total resource effort for each Work Breakdown Structure (WBS) element, by spacecraft, and for tracking and reporting manpower, materials, cost, schedule, travel, and subcontract performance.
SCSOW49	2.1.2.0-2	The RMS **shall** be consistent with the contract WBS and provide timely and traceable incorporation of contract changes, and document the effect on the resource management baseline.
SCSOW50	2.1.2.0-3	The Contractor **shall** use the RMS to provide traceable incorporation of contract changes and document the effect on the resource management baseline.
SCSOW51	2.1.2.0-4	The Contractor **shall** include within this WBS element at a minimum, all sub-elements described in applicable document 417-R-SCWBS-0060; Flight Project, Spacecraft, WBS Dictionary. This will assist the Government in organizing, describing, and reporting the design, analyses, fabrication, assembly, integration, testing, and operation of the satellite.
SCSOW52	2.1.2.0-5	The Contractor **shall** track non-recurring and recurring costs separately.
SCSOW53	2.1.2.0-6	The Contractor **shall** track schedule and cost data for all design and analyses.
SCSOW54	2.1.2.0-7	The Contractor **shall** track schedule and cost data for all fabrication, assembly, test, and verification.
SCSOW55	2.1.2.0-8	The Contractor **shall** organize and report schedule and cost data for design and analyses separately from fabrication, assembly, test, and verification.
SCSOW56	2.1.2.0-9	The Contractor **shall** utilize a scheduling tool for the generation and reporting of project schedules that is compatible with the latest version of Microsoft Project.
SCSOW1052	2.1.2.0-10	The Contractor **shall** implement an Earned Value Management System (EVMS) by which cost and schedule performance can be tracked and reported monthly in EVMS Reports.
SCSOW57	2.1.2.1	**2.1.2.1 Configuration Management (CM)**
SCSOW58	2.1.2.1.0-1	The Contractor **shall** manage the generation, configuration control, and distribution of all requirements, documents, data, drawings, software, hardware, and ground support equipment to develop and deliver all GOES-R series satellites.
SCSOW59	2.1.2.1.0-2	The Contractor **shall** control changes down to the part level for each GOES-R series satellite separately.
SCSOW60	2.1.2.1.0-3	The Contractor **shall** establish, implement, and maintain a Government approved CM System that provides control of configured items, all flight hardware and software, all GSE hardware and software, and all documentation developed under this contract.
SCSOW61	2.1.2.1.0-4	The Contractor **shall** review all applicable changes to configuration controlled documents managed by the Government in order to determine their feasibility and provide the Government with the estimated impact with respect to performance, schedule, and cost.
SCSOW62	2.1.2.1.0-5	The Contractor **shall** post to the Portal, as generated or changed, all technical and programmatic documentation generated on the contract that includes but is not limited to, letters, contractual documents, CDRL, systems engineering reports, design memos, internal technical memoranda, schematics, design specifications, test, and verification procedures.

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SCSOW63	2.1.2.1.0-6	The Government will post Government deliverables and technical documentation generated in support of this contract on the Portal.
SCSOW64	2.1.2.1.0-7	The Contractor **shall** notify the selected Government personnel by e-mail that a document has been posted on the website. The Government will provide similar notification to the Contractor.
SCSOW65	2.1.2.1.0-8	The Contractor **shall** develop, implement and maintain a Software CM System that provides baseline management and control of software requirements, design, source code, build files, data, and documentation.
SCSOW66	2.1.2.1.0-9	The Contractor **shall** employ a software source code version control tool to check in/check out current or previous versions of a source file.
SCSOW67	2.1.2.1.0-10	The Contractor **shall** establish a Configuration Control Board(s) (CCB) to review and approve changes to the prototype and flight models, software, GSE, and all controlled documents.
SCSOW70	2.1.2.1.0-11	If the Government determines that a Class II classification is incorrect the Contractor **shall** resubmit the change as a Class I change.
SCSOW71	2.1.2.2	**2.1.2.2 Information Technology Management**
SCSOW1210	2.1.2.2.0-1	The Contractor **shall** comply with government IT Security Policies and Procedures for all IT systems that interface with the Government.
SCSOW72	2.1.2.2.0-2	The Contractor **shall** provide all the information technology resources to perform all work required by this contract.
SCSOW73	2.1.2.2.0-3	The Contractor **shall** establish a joint Contractor/Government working group to define acceptable requirements and methods for GOES-R series data systems. These systems include access via the internet, provisions for protected email, transmission of all Contractor, subcontractor, vendor proprietary data, ITAR/Export Controlled information, Government For Official Use Only information, and NASA unclassified sensitive information between program elements and facilities.
SCSOW74	2.1.2.2.0-4	The Government will establish and maintain a secure website, accessible by the Contractor and selected Government personnel, for document exchange and collaboration of information.
SCSOW75	2.1.2.2.0-5	The Contractor **shall** establish and maintain a documentation system capable of supporting the transfer of all data and documentation, including schematics, block diagrams, drawings, analyses, plans, procedures, and reports to the Government.
SCSOW76	2.1.2.2.0-6	The Contractor **shall** supply and maintain all hardware and software to support the electronic delivery of CDRL items and other information as required.
SCSOW77	2.1.2.2.0-7	The Contractor **shall** develop and maintain all of the hardware, software, office space, internet access, and operational support for a Test Data Analysis System (TDAS).
SCSOW1173	2.1.2.2.0-8	The TDAS **shall** provide the Government access to spacecraft and integrated instrument raw test data within 24 hours, processed data for analyses purposes, test analyses, and test reports.
SCSOW78	2.1.2.2.0-9	The Contractor **shall** provide the Government with remote access to TDAS, Risk Management Systems, Documentation Systems, and Contractor GOES-R series intranet systems.
SCSOW79	2.1.2.2.0-10	The Contractor **shall** make available via remote access all Contractor and subcontractor documentation, data, analyses, schedules, formal reviews, test reports and other information generated for, or related to the GOES-R series effort, whether deliverable or not, to the Government.

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SCSOW80	2.1.2.2.0-11	The Documentation System **shall** provide email notification capability that allows the Government to subscribe and receive email notifications when documents are posted or updated.
SCSOW81	2.1.2.2.0-12	The Contractor **shall** provide, utilize, and maintain video conferencing, telephone conferencing, and internet conferencing at the Contractor's facilities for interaction between the Contractor and the Government.
SCSOW1049	2.1.2.2.0-13	The Contractor **shall** implement a photograph and video effort to document the fabrication, assembly, integration, test, verification and closeout prior to launch
SCSOW82	2.1.3	**2.1.3 Risk Management**
SCSOW83	2.1.3.0-1	The Contractor **shall** establish, implement and maintain a Risk Management System for identifying, analyzing, planning, tracking, controlling, and communicating the risks.
SCSOW88	2.1.3.0-2	The Contractor **shall** provide access to the Risk List through a Contractor provided secure web site that is available to the Government at any time.
SCSOW89	2.1.3.0-3	The Contractor **shall** communicate status of all the items on the Risk List, in particular primary (red) risks (those having both high probability and high impact/severity) as a minimum at the monthly reviews.
SCSOW90	2.1.3.0-4	The Contractor **shall**, prior to accepting a red risk, request and secure Government concurrence and provide supporting rationale that all mitigation options (within cost, schedule, and technical constraints) have been instituted.
SCSOW91	2.1.3.0-5	The Contractor **shall** retain due date, current status information, and justification for final closure, date closed, and provisions for Government concurrence for items on the Risk List.
SCSOW92	2.1.3.0-6	The Contractor **shall** retain all risk related analyses, documents, and data for the life of the contract.
SCSOW93	2.1.3.0-7	The Contractor **shall** coordinate risks, issues, problems, anomalies, and waivers among the implemented reporting systems.
SCSOW94	2.1.4	**2.1.4 Government Resident Office**
SCSOW95	2.1.4.0-1	The Contractor **shall** provide access, office space, furniture, printers, copier(s), facsimile machine (s), phones, and broadband access to the internet and Contractor's intranet through launch of the last GOES-R series satellite for three (3) NASA residents and three (3) Government visitors.
SCSOW96	2.1.4.0-2	The Contractor **shall** provide access, office space, furniture, facilities, networked printers, copier (s), facsimile machine(s), phones, and broadband access to the internet and Contractor's intranet at the I&T facility for an additional twenty five (25) visiting Government and Government Furnished Property (GFP) instrument contractor representatives during GFP instrument I&T activities.
SCSOW97	2.1.4.0-3	The Contractor **shall** ensure unencumbered non-escort access by the Government and Government support personnel to all Contractor and subcontractor facilities where program work is performed.
SCSOW98	2.1.4.0-4	If necessary, the Contractor **shall** execute Non-Disclosure Agreements with Non-NASA Government support contractors. NASA support contractors are covered by H.22 of the contract.
SCSOW99	2.1.4.0-5	The Contractor **shall** allow the Government representatives to bring Government and Government Support Contractor-owned computers, mobile phones, and personal digital assistants (PDAs) into the office space provided.

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SCSOW100	2.1.4.0-6	The Contractor **shall** allow visiting representatives to bring computers, mobile phones, and PDAs into and out of the facilities.
SCSOW101	2.1.4.0-7	The Contractor **shall** provide Government visitors the capability to print from their computers.
SCSOW102	2.1.4.0-8	The Contractor **shall** provide a conference room equipped with a teleconferencing system that is available for use by the Government capable of accommodating at least fifteen people.
SCSOW103	2.1.4.0-9	The Contractor **shall** provide parking to accommodate all Government representatives at all locations where program work is being performed.
SCSOW104	2.1.4.0-10	All badges, car passes, and passes for access, including computer entry and exit passes, **shall** be valid for at least 12 months before revalidation is required.
SCSOW105	2.1.4.0-11	If the Contractor requires training for entry into any facilities, the Contractor **shall** provide the training to Government representatives.
SCSOW106	2.1.4.0-12	The training requirements for Government representatives **shall** not exceed that required of the Contractor's employees.
SCSOW107	2.1.4.0-13	Required facility training **shall** be provided to Government representatives on an agreed upon schedule.
SCSOW108	2.1.4.0-14	The Contractor **shall** provide all protective clothing required for access to Contractor and subcontractor facilities and locker/storage for protective clothing.
SCSOW109	2.1.5	**2.1.5 Program Communication**
SCSOW110	2.1.5.0-1	The Contractor **shall** provide all the technical and administrative support for all program reviews and joint meetings.
SCSOW111	2.1.5.0-2	Program reviews will be used by the Government as “control gates”. Following the presentation of each review, a program evaluation will be made by the Government to determine if the Contractor has satisfactorily completed all work, and whether there are any program issues or deficiencies.
SCSOW112	2.1.5.0-3	The Contractor **shall** develop and deliver a corrective action plan within 10 days for any issues or deficiencies found during a review.
SCSOW113	2.1.5.0-4	The Contractor **shall** wait for Government approval of a corrective action plan for the issues or deficiencies prior to proceeding with the affected program development.
SCSOW114	2.1.5.0-5	Unless otherwise stipulated, all reviews and meetings will be held at the Contractor's facilities.
SCSOW116	2.1.5.1	**2.1.5.1 Kick-Off Meeting**
SCSOW117	2.1.5.1.0-1	Approximately one month after contract award the Contractor **shall** prepare and conduct a Kick-Off Meeting covering a line-by-line review of the contract schedule and clauses, SOW, Spacecraft Functional and Performance Specification (F&PS), General Interface Requirement Document (GIRD), Unique Instrument Interface Document (UIID)s, Spacecraft Mission Assurance Requirements (SCMAR), and CDRL.
SCSOW118	2.1.5.1.0-2	The Contractor **shall** plan for a five (5) day Kick-Off meeting, not including action item
SCSOW119	2.1.5.1.0-3	If the review is not complete in five (5) business days, the Contractor **shall** continue to conduct and support the review until the Government deems the review complete.
SCSOW120	2.1.5.2	**2.1.5.2 Teleconferences**

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SCSOW121	2.1.5.2.0-1	The Contractor **shall** conduct bi-weekly executive teleconferences to present, review and discuss technical, risks, schedule, and cost information and to address MAID items and issues.
SCSOW122	2.1.5.2.0-2	The Contractor **shall** conduct bi-weekly working group teleconferences to review and discuss technical information and to address MAID items and issues.
SCSOW123	2.1.5.2.0-3	Once I&T begins, the Contractor **shall** conduct daily on-site meetings and telecons with the Government team.
SCSOW124	2.1.5.3	**2.1.5.3 Project Management Reviews (PMR)**
SCSOW125	2.1.5.3.0-1	The Contractor **shall** prepare monthly PMR data packages for the purpose of reviewing the technical, risk, schedule, and cost status of the contract.
SCSOW126	2.1.5.3.0-2	The PMRs will be held every other month (bi-monthly) at the Government's facility through successful completion of the Critical Design Review, and then alternate between a Government designated facility and the Contractor's facility.
SCSOW127	2.1.5.3.0-3	The first PMR **shall** be held 60 days after contract award.
SCSOW128	2.1.5.4	**2.1.5.4 Technical Interchange Meetings (TIM)**
SCSOW129	2.1.5.4.0-1	The Contractor **shall** conduct TIMs requested by the Government for the purpose of discussing and resolving items of interest.
SCSOW130	2.1.5.4.0-2	The Government will accept requests by the Contractor for TIMs
SCSOW131	2.1.5.4.0-3	If the Contractor conducts TIMs with subcontractors for critical assemblies and subassemblies, the Contractor **shall** provide the Government 10 working days advanced notification so that Government representatives can be present.
SCSOW132	2.1.6	**2.1.6 Design Reviews**
SCSOW133	2.1.6.0-1	The Contractor **shall** prepare and conduct Spacecraft Design Reviews.
SCSOW134	2.1.6.0-2	The Government will chair all design reviews with the exception of the subsystem design reviews.
SCSOW135	2.1.6.0-3	The design reviews **shall** cover all aspects of flight and GSE hardware, software, design, analyses, validation, integration, testing, verification, and operations for which the Contractor has responsibility.
SCSOW136	2.1.6.0-4	The Contractor **shall** provide the Government with at least 10 working days advance notification so that Government representatives can be present at all design reviews.
SCSOW137	2.1.6.0-5	The Contractor **shall** accommodate attendance by the Government at design reviews.
SCSOW138	2.1.6.0-6	The Contractor **shall** conduct a dry run of each design review, with the Government team in attendance, approximately 2 weeks prior to the review.
SCSOW139	2.1.6.0-7	The Contractor **shall** plan dry runs to be the same duration as the design review.
SCSOW140	2.1.6.0-8	The Contractor **shall** provide the Government with a review data package 10 working days prior to all reviews and dry run reviews.
SCSOW141	2.1.6.0-9	The Contractor **shall** provide responses to RFAs in accordance with the CDRL.
SCSOW142	2.1.6.0-10	The Contractor **shall** document all RFAs in the MAID within 1 week after each design review.

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SCSOW143	2.1.6.0-11	Each design review **shall** be complete when approved by the Government.
SCSOW144	2.1.6.0-12	If the Government determines that follow-up reviews are required, the Contractor **shall** conduct such reviews at a time mutually agreed upon by the Government and the Contractor.
SCSOW145	2.1.6.0-13	The Contractor **shall** prepare and conduct all design reviews in compliance with GSFC-STD-1001 and GPR 8700.6A.
SCSOW146	2.1.6.1	**2.1.6.1 Systems Definition Review (SDR)**
SCSOW147	2.1.6.1.0-1	The Contractor **shall** prepare and conduct an SDR approximately six (6) months after contract award.
SCSOW148	2.1.6.1.0-2	The Contractor **shall** plan for a three-day review for SDR.
SCSOW149	2.1.6.2	**2.1.6.2 Preliminary Design Review (PDR)**
SCSOW150	2.1.6.2.0-1	The Contractor **shall** prepare and conduct a PDR at the conclusion of the preliminary design efforts and after testing the breadboard or brassboard models of critical subassemblies/assemblies.
SCSOW151	2.1.6.2.0-2	The Contractor **shall** plan for a three-day review for PDR.
SCSOW152	2.1.6.3	**2.1.6.3 Subsystem PDRs**
SCSOW153	2.1.6.3.0-1	The Contractor **shall** conduct PDRs for all subsystems, the Auxiliary Communications Services, and the magnetometer instruments.
SCSOW154	2.1.6.3.0-2	The Contractor **shall** chair all subsystem PDRs.
SCSOW155	2.1.6.3.0-3	The subsystem review panels **shall** consist of personnel not directly responsible for design or procurement of the hardware under review.
SCSOW156	2.1.6.4	**2.1.6.4 Subsystem Critical Design Reviews (CDR)s**
SCSOW157	2.1.6.4.0-1	The Contractor **shall** conduct subsystem CDR reviews.
SCSOW158	2.1.6.4.0-2	The Contractor **shall** chair all subsystem CDRs.
SCSOW159	2.1.6.4.0-3	The subsystem review panels **shall** consist of personnel not directly responsible for design or procurement of the hardware under review.
SCSOW160	2.1.6.5	**2.1.6.5 CDR**
SCSOW161	2.1.6.5.0-1	The Contractor **shall** prepare and conduct a CDR prior to the start of manufacture of flight hardware unless the Contractor requests and receives approval from the COTR or Contracting Officer for an earlier start.
SCSOW162	2.1.6.5.0-2	The Contractor **shall** plan for a four day CDR.
SCSOW163	2.1.6.6	**2.1.6.6 Design Modification Reviews**
SCSOW164	2.1.6.6.0-1	Upon Government determination, the Contractor **shall** hold a Design Modification Review for any Class I or Class II Configuration Change Requests (CCR)s following CDR.
SCSOW165	2.1.6.6.0-2	The Contractor **shall** plan two days for each Design Modification Review.
SCSOW1048	2.1.6.7	**2.1.6.7 Pre-Environmental Review (PER)**

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SCSOW166	2.1.6.7.0-1	The Contractor **shall** prepare and conduct a PER prior to the start of environmental testing of each satellite to establish the readiness of the satellite to support the environmental test program.
SCSOW167	2.1.6.7.0-2	The Contractor **shall** plan for a three-day PER.
SCSOW168	2.1.6.8	**2.1.6.8 Satellite Pre-Shipment Review (PSR)**
SCSOW170	2.1.6.8.0-1	The Contractor **shall** prepare and conduct a PSR prior to shipping the satellite to NASA Kennedy Space Center (KSC).
SCSOW171	2.1.6.8.0-2	The Contractor **shall** plan for a three-day PSR.
SCSOW1218	2.1.6.9	**2.1.6.9 Satellite Storage Review (SSR)**
SCSOW169	2.1.6.9.0-1	The Contractor **shall** prepare and conduct a pre-storage review prior to placement of each satellite into storage.
SCSOW1219	2.1.6.9.0-2	The Contractor **shall** plan for a three-day SSR.
SCSOW172	2.1.7	**2.1.7 Miscellaneous Reviews**
SCSOW173	2.1.7.0-1	The Contractor **shall** provide the Government with at least 10 working days advance notification to all reviews.
SCSOW174	2.1.7.0-2	The Contractor **shall** accommodate attendance by the Government at all reviews.
SCSOW175	2.1.7.0-3	The Contractor **shall** provide the Government with a review data package 10 working days prior to all reviews and dry run reviews.
SCSOW178	2.1.7.1	**2.1.7.1 Integrated Baseline Review (IBR)**
SCSOW179	2.1.7.1.0-1	Approximately four months after contract award the Contractor **shall** prepare and conduct an IBR that describes their performance measurement baseline for the contract.
SCSOW180	2.1.7.1.0-2	The IBR **shall** include the EVMS plan, time phased expenditure plan, integrated master schedule, resource loading, cost accounts, and work packages.
SCSOW1113	2.1.7.1.0-3	The Contractor **shall** structure all plans, schedules, accounts, loading, and work packages according to the work breakdown structure.
SCSOW181	2.1.7.1.0-4	The IBR **shall** include a review of the Contractor's earned value assessment and reporting systems.
SCSOW182	2.1.7.1.0-5	The Contractor **shall** plan for a five (5) day IBR, not including action item resolution.
SCSOW183	2.1.7.2	**2.1.7.2 Engineering Peer Reviews**
SCSOW184	2.1.7.2.0-1	The Contractor **shall** implement a program of periodic tabletop engineering peer reviews throughout the development life cycle to identify and address risks, problems, and issues as they arise prior to satellite level reviews in accordance with GPR 8700.6A.
SCSOW185	2.1.7.2.0-2	The Contractor **shall** establish and maintain engineering review teams comprised of technical experts with experience relevant to the technology and requirements.
SCSOW186	2.1.7.2.0-3	The Contractor **shall** ensure for each review that the majority of the review team members are external to the GOES-R series effort.
SCSOW187	2.1.7.3	**2.1.7.3 Software Reviews**

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SCSOW188	2.1.7.3.0-1	The Contractor **shall** implement a program of periodic tabletop peer reviews throughout the development life cycle to identify and address risks, problems, and issues as they arise prior to satellite level reviews as defined in the Software Management Plan.
SCSOW189	2.1.7.3.0-2	The Contractor **shall** establish software review teams comprised of technical experts with experience relevant to the technology and requirements.
SCSOW190	2.1.7.3.0-3	The Contractor **shall** ensure for each review that the majority of the review team members are external to the GOES-R series effort.
SCSOW198	2.1.7.3.1	**2.1.7.3.1 Software Requirement Review**
SCSOW199	2.1.7.3.1.0-1	The Contractor **shall** conduct a Software Requirement Review of the Software Requirements Specification for all Class B and Class C software (Class B and C as defined in NPR 7150.2, Software Engineering Requirements).
SCSOW200	2.1.7.3.1.0-2	The Contractor **shall** conduct the Software Requirement Review in conjunction with the SDR.
SCSOW201	2.1.7.3.2	**2.1.7.3.2 Software Test Readiness Review (TRR)**
SCSOW202	2.1.7.3.2.0-1	The Contractor **shall** conduct a software TRR prior to the verification of Class B and Class C software.
SCSOW203	2.1.7.3.3	**2.1.7.3.3 Software Qualification Review**
SCSOW204	2.1.7.3.3.0-1	The Contractor **shall** conduct a Software Qualification Review for each version of Class B and Class C software prior to formal release.
SCSOW1125	2.1.7.3.3.0-2	The Contractor **shall** include results of testing and software verification in the Software Qualification Review.
SCSOW205	2.1.7.4	**2.1.7.4 Instrument Receiving Reviews**
SCSOW206	2.1.7.4.0-1	The Contractor **shall** prepare and conduct an Instrument Receiving Review in conjunction with each GFP instrument contractor prior to the shipping of each GFP instrument prototype model (PTM), flight model (FM), and test equipment from the GFP instrument contractor to the Contractor.
SCSOW1127	2.1.7.4.0-2	The Instrument Receiving Review **shall** establish the readiness of the GFP instrument and include an evaluation of the handling plans and procedures.
SCSOW207	2.1.7.4.0-3	The Contractor **shall** plan for a half-day review or combine this activity with the GFP instrument pre-ship review for each GFP instrument.
SCSOW208	2.1.7.5	**2.1.7.5 Test Reviews**
SCSOW212	2.1.7.5.0-1	The Contract **shall** submit a list of test reviews to the Government for approval.
SCSOW209	2.1.7.5.0-2	The Contractor **shall** prepare and conduct a TRR prior to the start of each of the following I&T events: Regression Testing, GFP Instrument Integration, Stray Magnetics, Mass Properties, Pyro Shock Deployment, Radio Frequency (RF) Airlink Testing, Mechanical Environments, EMI/EMC Testing, Stray Magnetics Testing, Magnetic Dipole Testing, Mass Properties and Alignment Testing, Spacecraft Thermal Vacuum Testing, End-to-End (ETE) Testing, and Launch Base Processing.
SCSOW210	2.1.7.5.0-3	The Contractor **shall** prepare a TRR specific Data Package, in a Contractor defined format, and provide that package to the Government no later than 5 days before the TRR.

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SCSOW211	2.1.7.5.0-4	The Contractor **shall** include sub-assemblies and subcontracted subassemblies as well as instrument level test data in test data reviews.
SCSOW213	2.1.7.5.0-5	The Contractor **shall** conduct a briefing of the test results following the completion of each major phase and regression test during I&T.
SCSOW215	2.1.7.5.0-6	The Contractor **shall** prepare and conduct a Break of Configuration (BOC) Review of the interim data and test results prior to the breakdown of any test setup/configurations for the following I&T events: Regression Testing, GFP Instrument Integration, RF Airlink Testing, Mechanical Environments, EMI/EMC Testing, Stray Magnetics Testing, Magnetic Dipole Testing, Mass Properties and Alignment Testing, Spacecraft Thermal Vacuum Testing, and Launch Base Processing.
SCSOW1131	2.1.7.5.0-7	Prior to the breakdown of any test setup the Government will determine if the test data prove compliance with the requirements being verified or validated by the testing.
SCSOW216	2.1.7.5.0-8	If the Government determines that the data does not prove to be compliant with the requirements, the Contractor **shall** resolve the non-compliances prior to the breakdown of the test setup.
SCSOW217	2.1.7.5.0-9	The Contractor **shall** prepare a BOC specific Data Package available at the BOC meeting, in a Contractor defined format.
SCSOW218	2.1.7.5.0-10	The Contractor **shall** conduct BOC reviews prior to the shipment of deliverable GSE.
SCSOW219	2.1.7.5.0-11	The Contractor **shall** prepare and conduct a Post Test Review (PTR) of the finalized data and test results following the completion of each of the following I&T events: Regression Testing, GFP Instrument Integration, RF Airlink Testing, Mechanical Environments, EMI/EMC Testing, Stray Magnetics Testing, Magnetic Dipole Testing, Mass Properties and Alignment Testing, Spacecraft Thermal Vacuum Testing, and Launch Base Processing.
SCSOW220	2.1.7.5.0-12	The Contractor **shall** prepare a PTR specific Data Package, in a Contractor defined format, and provide that package to the Government no later than 5 business days before the PTR.
SCSOW221	2.1.7.6	**2.1.7.6 Satellite Handover Review**
SCSOW222	2.1.7.6.0-1	The Contractor **shall** prepare and conduct a satellite handover review at the conclusion of on-orbit checkout and prior to Government acceptance.
SCSOW223	2.1.7.6.0-2	The Contractor **shall** plan for a one-day satellite handover review at the NOAA SOCC.
SCSOW224	2.1.8	**2.1.8 Review Support**
SCSOW225	2.1.8.0-1	The Government will be required to conduct or participate in independent and external reviews.
SCSOW226	2.1.8.0-2	The Contractor **shall** provide support to the Government for all independent and standing
SCSOW227	2.1.8.0-3	The Contractor **shall** attend and support GFP instrument design reviews.
SCSOW228	2.1.8.0-4	The Contractor **shall** attend and support ground segment design reviews.
SCSOW229	2.1.8.0-5	The Contractor **shall** support the Government in the preparation and execution of the Program System Integration Review (SIR).
SCSOW230	2.1.8.0-6	The Contractor **shall** plan for a five (5) day SIR.
SCSOW231	2.1.8.0-7	The Contractor **shall** support the Mission Operation Review (MOR).
SCSOW232	2.1.8.0-8	The Contractor **shall** plan for a three (3) day MOR.

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SCSOW233	2.1.8.0-9	The Contractor **shall** support the Mission Readiness Review (MRR). The MRR is the final approval review by which GSFC Center Management determines that the GOES-R mission is ready for launch and operations
SCSOW234	2.1.8.0-10	The Contractor **shall** plan for a one (1) day MRR.
SCSOW235	2.1.8.0-11	The Contractor **shall** support the Flight Readiness Review (FRR) to be conducted by the Government. The FRR is the final approval review by NASA that the GOES-R mission is ready for launch and operations.
SCSOW236	2.1.8.0-12	The Contractor **shall** plan for a one (1) day FRR.
SCSOW237	2.1.8.0-13	The Contractor **shall** support the Launch Readiness Review (LRR). The Launch Range conducts the LRR, which is the final review prior to launch that verifies the Launch System and Satellite are ready.
SCSOW238	2.1.8.0-14	The Contractor **shall** plan for a one (1) day LRR.
SCSOW239	2.1.8.0-15	The Contractor **shall** support the Flight Operations Review (FOR).
SCSOW240	2.1.8.0-16	The Contractor **shall** plan for a three (3) day FOR.
SCSOW241	2.1.8.0-17	The Contractor **shall** support the Operation Readiness Review (ORR).
SCSOW242	2.1.8.0-18	The Contractor **shall** plan for a three (3) day ORR.
SCSOW243	2.1.8.0-19	The Contractor **shall** support the Phase 0/I, II, III Safety Reviews at the KSC.
SCSOW244	2.1.8.0-20	The Contractor **shall** plan for three (3) days for each of the Phases 0/I, II, III Safety Reviews.
SCSOW1105	2.1.8.0-21	The Contractor **shall** provide personnel representing Systems Engineering and Spacecraft I&T, at a minimum, at the Ground Operations Readiness Review (GORR) held at the Launch Base Payload Processing Facility (PPF).
SCSOW1106	2.1.8.0-22	The Contractor **shall** plan for a one (1) day GORR.
SCSOW1107	2.1.8.0-23	The Contractor **shall** provide personnel representing Systems Engineering and Spacecraft I&T, at a minimum, at two (2) planned Ground Operations Working Group (GOWG) meetings held at the Launch Site.
SCSOW1108	2.1.8.0-24	The Contractor **shall** plan for two (2), one (1) day GOWGs.
SCSOW245	2.2	**2.2 Systems Engineering**
SCSOW246	2.2.1	**2.2.1 Systems Engineering Management**
SCSOW247	2.2.1.0-1	The Contractor **shall** establish a program-level systems engineering office that directly manages all systems engineering efforts for each spacecraft development.
SCSOW248	2.2.1.0-2	The Government will approve the spacecraft resource budgets.
SCSOW249	2.2.2	**2.2.2 Systems Engineering Support**
SCSOW250	2.2.2.0-1	The Contractor **shall** provide systems engineering to support the design and development of the spacecraft and incorporation of the GFP instruments.

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SCSOW251	2.2.2.0-2	The Contractor **shall** analyze the total spacecraft design including performance margins requirements and design approaches to assure achievement of the required spacecraft life, spacecraft operations concept, design integrity, failure modes, intra-system and inter-system compatibility, reliability and maintainability, producibility, safety, survivability, training, testability, and verification.
SCSOW252	2.2.2.0-3	The Contractor **shall** oversee all of the work associated with the development of the spacecraft.
SCSOW253	2.2.3	**2.2.3 System Designs, Analyses and Trades**
SCSOW254	2.2.3.0-1	The Contractor **shall** perform all system studies and trades and risk assessment to develop the design for the spacecraft.
SCSOW255	2.2.4	**2.2.4 Requirements and Specification Generation**
SCSOW256	2.2.4.0-1	The Contractor **shall** define, implement, and maintain a Systems Engineering Requirements Management System for managing, detailing, organizing, controlling, linking, and verifying the requirements.
SCSOW257	2.2.4.0-2	The Contractor **shall** utilize Telelogic DOORS® requirements management tool to capture, link, trace, analyze, and manage changes to all requirements documentation.
SCSOW258	2.2.4.0-3	The Contractor **shall** perform all systems analyses and systems engineering to derive lower-level performance requirements and develop the spacecraft system specification and design specifications for the spacecraft subsystems.
SCSOW259	2.2.4.0-4	The Contractor **shall** document the allocation of requirements to the lower level specifications, showing the traceability of all requirements including performance and design drivers, and explicitly identifying any derived requirements.
SCSOW260	2.2.4.0-5	The Contractor **shall** validate that the lower level requirements meet the Government
SCSOW261	2.2.4.0-6	The Contractor **shall** verify that lower level requirements are met.
SCSOW262	2.2.5	**2.2.5 Performance Verification Plans and Procedures**
SCSOW263	2.2.5.0-1	The Contractor **shall** establish a system performance verification program.
SCSOW1135	2.2.5.0-2	The system performance verification program **shall** document the overall verification strategy, methodology, planning, and implementation.
SCSOW1136	2.2.5.0-3	The system performance verification program **shall** provide traceability from system requirements to launch and end-of-life capability. This will also provide the baseline for tracking on-orbit performance versus pre-launch capability.
SCSOW264	2.2.5.0-4	The Contractor **shall** develop and maintain all plans and procedures to verify that the GOES-R spacecraft meets all requirements described in the GOES-R Spacecraft F&PS, GIRD, UIIDs and GFP Instrument Interface Control Documents (ICD)s.
SCSOW265	2.2.5.0-5	The Contractor **shall** perform and document all analyses of the data and information from the design, development, qualification testing, acceptance testing, compatibility testing, and on-orbit testing of the Contractor's hardware and software.
SCSOW266	2.2.5.0-6	The Contractor **shall** map all requirements to specific verification test plans and procedures utilizing the DOORS data base.
SCSOW267	2.2.5.0-7	The Contractor **shall** include in the system level in verification plans and procedures, the development of all verification reports, external reviews, and GFP instrument requirements to be verified.

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SCSOW268	2.2.6	**2.2.6 Interface Definition and Control**
SCSOW269	2.2.6.1	**2.2.6.1 Instrument Interfaces**
SCSOW270	2.2.6.1.0-1	The Contractor **shall** perform all systems analyses and engineering to define the spacecraft-to-instrument interfaces.
SCSOW271	2.2.6.1.0-2	The Contractor **shall** establish a joint Contractor/Government /GFP Instrument Contractor Instrument Interface working group.
SCSOW272	2.2.6.1.0-3	The Contractor **shall** designate a technical representative for each GFP instrument.
SCSOW275	2.2.6.1.0-4	The Contractor **shall** negotiate and document the Spacecraft to Instrument ICDs with the respective GFP instrument contractors.
SCSOW276	2.2.6.1.0-5	The Contractor **shall** negotiate and document, in the Spacecraft to Instrument ICDs, all requirements not specified in GIRD or UIID.
SCSOW277	2.2.6.1.0-6	The Contractor, working with the GFP instrument contractors, **shall** define and document in the ICD the location and orientation of all GFP instrument units on the spacecraft.
SCSOW278	2.2.6.2	**2.2.6.2 Ground Interfaces**
SCSOW279	2.2.6.2.0-1	The Contractor **shall** perform all systems analyses and engineering to define all aspects of the space to ground interfaces.
SCSOW280	2.2.6.2.0-2	The Contractor **shall** establish a joint Contractor/Government /Ground Contractor Ground Interface working group.
SCSOW282	2.2.6.2.0-3	The Contractor **shall** negotiate and document all space to ground ICDs with the ground segment contractor.
SCSOW283	2.2.6.2.0-4	The Contractor **shall** designate a technical representative for the ground segment.
SCSOW284	2.2.6.2.0-5	The Contractor **shall** perform all analyses and tests to verify that the spacecraft meets the interfaces required to ensure instrument INR performance. The INR interfaces include both physical and data interfaces.
SCSOW285	2.2.6.2.0-6	The Contractor **shall** conduct INR analyses using flight environments and scenarios.
SCSOW1140	2.2.6.2.0-7	The Contractor **shall** conduct and document INR testing using flight-like environments and scenarios.
SCSOW1139	2.2.6.2.0-8	The Contractor **shall** document and provide rationale for any non-flight-like INR testing.
SCSOW286	2.2.6.3	**2.2.6.3 Launch Vehicle Interfaces**
SCSOW287	2.2.6.3.0-1	The Contractor **shall** perform all systems analyses and engineering to define all aspects of the spacecraft-to-launch vehicle interface.
SCSOW288	2.2.6.3.0-2	The Contractor **shall** provide technical support and satellite inputs required to develop the Spacecraft/Launch Vehicle ICD.
SCSOW289	2.2.6.3.0-3	The Spacecraft/Launch Vehicle ICD will be developed and maintained by the Launch Vehicle Contractor.
SCSOW290	2.2.6.3.0-4	The Contractor **shall** provide technical support required to perform Spacecraft to Launch Vehicle I&T, including the verification of all Spacecraft/Launch Vehicle ICD requirements.

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SCSOW291	2.2.6.3.0-5	The Mission Specific Analyses will be developed by the Launch Vehicle Contractor. Spacecraft inputs to the Mission Specific Analyses, are required as part of Spacecraft/Launch Vehicle ICD development.
SCSOW292	2.2.6.3.0-6	The Contractor **shall** provide technical support and spacecraft data required to develop the Mission Specific Analyses. The Mission Specific Analyses will be performed by the launch service provider. The Mission Specific Analyses will include but are not limited to the Preliminary Mission Analysis (PMA), Detailed Test Objectives (DTO), Performance and Guidance Accuracy Analysis, Trajectory Analysis, PLF Venting Analysis, RF Compatibility Analysis, RF Link Analysis, Spacecraft Separation Analysis, EMI/EMC Analysis, Launch Vehicle Payload Fairing Critical Clearance Analysis, Coupled Loads Analysis, and Integrated Thermal Analysis.
SCSOW293	2.2.6.3.0-7	The Contractor **shall** provide technical support required to evaluate results of all Mission Specific Analyses developed by the launch vehicle contractor.
SCSOW294	2.2.6.3.0-8	Launch base program requirements documents (PRDs) will be developed and maintained by the Launch Vehicle Contractor. PRDs will define spacecraft support requirements for launch base processing activities.
SCSOW295	2.2.6.3.0-9	The Contractor **shall** provide technical support and spacecraft data required to develop launch base PRDs.
SCSOW296	2.2.7	**2.2.7 Contamination**
SCSOW297	2.2.7.0-1	The Contractor **shall** control contamination through all phases of the development and of I&T of the satellite.
SCSOW298	2.2.7.0-2	The Contractor **shall** monitor both particulate and molecular contamination for flight articles and facilities from the beginning of the integration activities through the launch of the satellite.
SCSOW299	2.2.7.0-3	The Contractor **shall** perform all processing required to maintain cleanliness at specified levels.
SCSOW300	2.2.7.0-4	The Contractor **shall** accommodate GFP instrument cleaning by the GFP instrument contractors.
SCSOW301	2.2.7.0-5	The Contractor **shall** report all contamination activities and cleanliness verifications in accordance with the approved contamination control plan.
SCSOW302	2.2.7.0-6	The Contractor **shall** perform a mass transport analyses and a particle generation analyses for the satellite.
SCSOW303	2.2.7.0-7	The Contractor **shall** establish, document, and implement contamination allowances and budgets for performance degradation of satellite optical and thermal contamination-sensitive hardware over the mission lifetime.
SCSOW304	2.2.7.0-8	The Contractor **shall** incorporate GFP instrument contamination allowances, budgets, and analyses into the satellite contamination analyses.
SCSOW305	2.3	**2.3 Safety and Mission Assurance (S&MA)**
SCSOW306	2.3.1	**2.3.1 S&MA Management**
SCSOW307	2.3.1.0-1	The Contractor **shall** provide all functions to execute the mission assurance and verification effort for the spacecraft as documented in the GOES-R SCMAR.
SCSOW308	2.3.2	**2.3.2 Safety**
SCSOW309	2.3.2.0-1	The Contractor **shall** comply with safety requirements for the spacecraft as documented in the SCMAR 417-R-SCMAR-0011 and AFSPCMAN 91-710.

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SCSOW310	2.3.3	**2.3.3 Parts Control**
SCSOW311	2.3.3.0-1	The Contractor **shall** perform parts control for the spacecraft as defined in the SCMAR.
SCSOW312	2.3.4	**2.3.4 Materials and Processes Control**
SCSOW313	2.3.4.0-1	The Contractor **shall** comply with the Materials and Processes Control requirements for the spacecraft as defined in the SCMAR.
SCSOW314	2.3.5	**2.3.5 Reliability**
SCSOW315	2.3.5.0-1	The Contractor **shall** comply with the Reliability requirements for the spacecraft as defined in the SCMAR.
SCSOW316	2.3.5.0-2	The Contractor **shall** incorporate GFP instrument FMEAs and reliability data into the overall spacecraft reliability analyses.
SCSOW317	2.3.6	**2.3.6 Quality Assurance**
SCSOW318	2.3.6.0-1	The Contractor **shall** comply with the Quality Assurance requirements for the spacecraft as defined in the SCMAR.
SCSOW319	2.3.7	**2.3.7 Software Assurance**
SCSOW320	2.3.7.0-1	The Contractor **shall** comply with the Software Assurance requirements for the spacecraft as defined in the NASA-STD-8739.8, Software Assurance Standard.
SCSOW321	2.3.7.1	**2.3.7.1 Software Safety**
SCSOW322	2.3.7.1.0-1	The Contractor **shall** comply with the Software Safety requirements for the spacecraft as defined in the NASA-STD-8719.13B; NASA Software Safety Technical Standard.
SCSOW323	2.3.7.1.0-2	The Contractor **shall** verify all safety-critical software (as defined in NASA-STD-8719.13B) on flight or flight-like hardware.
SCSOW324	2.3.7.2	**2.3.7.2 Software Verification and Validation**
SCSOW325	2.3.7.2.0-1	The Contractor **shall** implement a Software Verification and Validation (V&V) program to ensure that software being developed or maintained satisfies functional, performance, and other requirements at each stage of the development process, and that the final product meets customer requirements.
SCSOW329	2.3.7.3	**2.3.7.3 Independent Validation and Verification**
SCSOW330	2.3.7.3.0-1	NASA will perform an Independent Verification and Validation (IV&V) effort.
SCSOW1147	2.3.7.3.0-2	The Contractor **shall** provide the IV&V personnel access to all software reviews and reports, TIMs, Contractor plans and procedures, software code, software design documentation, and software problem reporting data.
SCSOW1126	2.3.7.3.0-3	The Contractor **shall** furnish copies of requested information to IV&V personnel.
SCSOW331	2.3.7.3.0-4	The Contractor **shall** review and assess all IV&V findings and recommendations and implement corrective actions.
SCSOW332	2.3.7.4	**2.3.7.4 Software Problem Reporting and Corrective Action**

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SCSOW333	2.3.7.4.0-1	The Contractor **shall** implement a process for Software Problem Reporting and Corrective Action that addresses reporting, analyzing, and correcting software non-conformances and software test failures reported in Software Problem Reports (SPRs) throughout the development lifecycle.
SCSOW334	2.3.7.4.0-2	The Contractor **shall** provide for a corrective action process that tracks every software nonconformance to its final disposition
SCSOW335	2.4	**2.4 Spacecraft**
SCSOW336	2.4.0-1	The Contractor **shall** design, analyze, validate, fabricate, assemble, integrate, test, verify, support launch, and support on-orbit operations for the spacecraft.
SCSOW337	2.4.0-2	The Contractor **shall** ensure all spacecraft technologies are at TRL 6 by PDR as defined by NPR 7123.1A - NASA Systems Engineering Processes and Requirements Table G-19 - Technology Readiness Levels.
SCSOW338	2.4.0-3	The Contractor **shall** identify and submit to the government for approval, a list critical assemblies and subassemblies.
SCSOW340	2.4.1	**2.4.1 Spacecraft Management**
SCSOW341	2.4.1.0-1	The Contractor **shall** perform the direct management functions and provide the management structure to plan, direct, and execute all elements to deliver the spacecraft.
SCSOW342	2.4.1.0-2	The Contractor **shall** provide a full-time spacecraft manager through acceptance of the spacecraft, who is responsible for the day to day activities from contract award through delivery of the satellite to the Government.
SCSOW343	2.4.2	**2.4.2 Mechanical**
SCSOW344	2.4.2.0-1	The Contractor **shall** design, analyze, and validate the mechanical subsystem.
SCSOW345	2.4.2.0-2	The Contractor **shall** fabricate, assemble, test, and verify the mechanical subsystem.
SCSOW346	2.4.2.0-3	Unless otherwise specified, the Contractor **shall** provide all mounting hardware for the instrument units.
SCSOW347	2.4.2.0-4	The Contractor **shall** develop and maintain an integrated satellite mechanical model which includes all GFP instrument and spacecraft mechanical models.
SCSOW348	2.4.3	**2.4.3 Thermal**
SCSOW349	2.4.3.0-1	The Contractor **shall** design, analyze, and validate the thermal subsystem.
SCSOW350	2.4.3.0-2	The Contractor **shall** fabricate, assemble, test, and verify the thermal subsystem.
SCSOW352	2.4.3.0-3	The Contractor **shall** integrate all GFP instrument and spacecraft thermal models into a satellite thermal model.
SCSOW353	2.4.4	**2.4.4 Guidance, Navigation, & Control (GN&C)**
SCSOW354	2.4.4.0-1	The Contractor **shall** design, analyze, and validate the GN&C subsystem.
SCSOW355	2.4.4.0-2	The Contractor **shall** fabricate, assemble, test, and verify the GN&C subsystem.
SCSOW356	2.4.5	**2.4.5 Command & Data Handling (C&DH)**
SCSOW357	2.4.5.0-1	The Contractor **shall** design, analyze, and validate the C&DH subsystem.

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SCSOW358	2.4.5.0-2	The Contractor **shall** fabricate, assemble, test, and verify the C&DH subsystem.
SCSOW359	2.4.5.0-3	The Contractor **shall** develop, validate, verify, and maintain the satellite telemetry and command database format jointly with the ground contractor and GFP instrument contractors.
SCSOW473	2.4.5.0-4	The Contractor **shall** integrate the GFP instrument contractors' telemetry, commands, and limits databases into the satellite telemetry and command database.
SCSOW360	2.4.5.1	**2.4.5.1 C&DH Harnesses**
SCSOW361	2.4.5.1.0-1	The Contractor **shall** design, analyze, and validate the C&DH harnesses and cables.
SCSOW362	2.4.5.1.0-2	The Contractor **shall** fabricate, assemble, test, and verify the C&DH harnesses and cables.
SCSOW363	2.4.6	**2.4.6 Communications (COMM)**
SCSOW364	2.4.6.0-1	The Contractor **shall** design, analyze, and validate the COMM subsystem and the Auxiliary Communication Services including the encryption and decryption of the COMM interface.
SCSOW365	2.4.6.0-2	The Contractor **shall** fabricate, assemble, test, and verify the COMM subsystem and the Auxiliary Communication Services including the encryption and decryption of the COMM interface.
SCSOW366	2.4.6.1	**2.4.6.1 COMM Harnesses**
SCSOW367	2.4.6.1.0-1	The Contractor **shall** design, analyze, and validate the COMM harnesses and cables.
SCSOW368	2.4.6.1.0-2	The Contractor **shall** fabricate, assemble, test, and verify the COMM harnesses and cables.
SCSOW369	2.4.7	**2.4.7 Power**
SCSOW370	2.4.7.0-1	The Contractor **shall** design, analyze, and validate the power subsystem.
SCSOW371	2.4.7.0-2	The Contractor **shall** fabricate, assemble, test, and verify the power subsystem.
SCSOW372	2.4.7.1	**2.4.7.1 Battery**
SCSOW373	2.4.7.1.0-1	The Contractor **shall** design, analyze, and validate the spacecraft batteries.
SCSOW1053	2.4.7.1.0-2	The Contractor **shall** fabricate, assemble, test, and verify the spacecraft batteries.
SCSOW374	2.4.7.1.0-3	The Contractor **shall** develop one (1) life test battery built to flight design specifications and subject it to environmental acceptance testing.
SCSOW375	2.4.7.1.0-4	The Contractor **shall** develop one (1) flight battery built to flight design specifications and subject it to environmental acceptance testing.
SCSOW376	2.4.7.1.0-5	The Contractor **shall** develop one (1) flight spare battery built to flight design specifications and subject it to environmental acceptance testing.
SCSOW377	2.4.7.1.0-6	The Contractor **shall** develop one (1) qualification/I&T battery built to flight design specifications and subject it to environmental qualification testing.
SCSOW378	2.4.7.1.0-7	The Contractor **shall** deliver twelve (12) battery test cells from the flight cell lot to the GSFC Battery Lab for performance testing.
SCSOW379	2.4.7.1.0-8	The Contractor **shall** provide all analyses, life test data, qualification test data, and acceptance test data for both the battery cells and battery to assist the government in determining compliance with the battery requirements.

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SCSOW380	2.4.7.1.0-9	The Contractor **shall** provide the cell lot acceptance criteria and the supporting test data for each cell in the lot to assist the government in determining compliance with the battery requirements.
SCSOW381	2.4.7.1.1	**2.4.7.1.1 Battery Qualification**
SCSOW382	2.4.7.1.1.0-1	The Contractor **shall** perform battery qualification testing.
SCSOW383	2.4.7.1.1.0-2	The qualification battery **shall** consist of the flight cells from the same lot, flight battery packaging with flight connectors, flight cell and flight battery voltage monitoring, and flight cell and flight battery temperature monitoring.
SCSOW384	2.4.7.1.1.0-3	If cell voltage balancing is planned for flight, the qualification test battery **shall** incorporate the flight voltage balancing electronics and its planned flight use into the battery qualification testing.
SCSOW385	2.4.7.1.1.0-4	The Contractor **shall** define, analyze, and document the requirements for environmental tests associated with the battery qualification testing.
SCSOW386	2.4.7.1.1.0-5	The Contractor **shall** conduct test data reviews with the Government after each environmental test during the battery qualification testing so that the Government can determine acceptability of data and whether it is safe to proceed.
SCSOW387	2.4.7.1.1.0-6	After completion of the battery qualification testing, the battery will be used to support the spacecraft I&T test program.
SCSOW388	2.4.7.1.2	**2.4.7.1.2 Battery Life Testing**
SCSOW389	2.4.7.1.2.0-1	The Contractor **shall** perform battery life testing.
SCSOW390	2.4.7.1.2.0-2	The life test battery **shall** consist of the flight components and material.
SCSOW391	2.4.7.1.2.0-3	If cell voltage balancing is planned for flight, the life test battery **shall** incorporate the flight voltage balancing electronics and its planned flight use into the battery life testing.
SCSOW392	2.4.7.1.2.0-4	The Contractor **shall** define, analyze, and document the requirements for and results of life tests associated with the battery life testing.
SCSOW393	2.4.7.2	**2.4.7.2 Solar Array**
SCSOW395	2.4.7.2.0-1	The Contractor **shall** design, analyze, and validate the solar array.
SCSOW396	2.4.7.2.0-2	The Contractor **shall** fabricate, assemble, test, and verify the solar array.
SCSOW1211	2.4.7.2.0-3	The Contractor **shall** perform an LPT on each solar array if stored for greater than 1 year.
SCSOW397	2.4.7.3	**2.4.7.3 Power Regulation and Conditioning**
SCSOW398	2.4.7.3.0-1	The Contractor **shall** design, analyze, and validate the power regulation and conditioning.
SCSOW1054	2.4.7.3.0-2	The Contractor **shall** fabricate, assemble, test, and verify the power regulation and conditioning.
SCSOW399	2.4.7.4	**2.4.7.4 Power Harnesses**
SCSOW400	2.4.7.4.0-1	The Contractor **shall** design, analyze, and validate the power harnesses and cables.
SCSOW1055	2.4.7.4.0-2	The Contractor **shall** fabricate, assemble, test, and verify the power harnesses and cables.
SCSOW401	2.4.8	**2.4.8 Propulsion**

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SCSOW402	2.4.8.0-1	The Contractor **shall** design, analyze, and validate the propulsion subsystem.
SCSOW403	2.4.8.0-2	The Contractor **shall** fabricate, assemble, test, and verify the propulsion subsystem.
SCSOW404	2.4.9	**2.4.9 Flight Software**
SCSOW405	2.4.9.0-1	The Contractor **shall** develop, validate, verify, and maintain flight software.
SCSOW406	2.4.9.0-2	The Contractor **shall** classify all spacecraft flight software as Class B software as defined in NPR 7150.2, Software Engineering Requirements.
SCSOW1056	2.4.9.0-3	The Contractor **shall** develop flight software in accordance with the requirements of NPR 7150.2 sections: 2.2, 2.3, 2.4, 3 (all), 4.1, 4.2, 4.3, 4.4.1, 4.4.2, 4.4.3, and 5 (all).
SCSOW1057	2.4.9.0-4	The Contractor **shall** conduct an Unused Code Analysis, as specified in Section 8.5.4 of NASA Guidebook 8719.13B, for any flight qualified Class B software.
SCSOW408	2.4.9.0-5	The Contractor **shall** provide and maintain one FSDE, including hardware, software, procedures, and associated documentation, to be used for the life cycle management, development, and verification of the flight software at the Contractor's facility.
SCSOW409	2.4.9.0-6	The Contractor **shall** provide and maintain one FSDE, including hardware, software, procedures, and associated documentation for delivery to the Government for development, test, and verification of software patches that may be required throughout the operational phase of the mission.
SCSOW410	2.4.9.0-7	The Contractor **shall** deliver the source and executable flight software code.
SCSOW1058	2.4.9.0-8	For all Class B software (as defined in NPR 7150.2), the personnel responsible for the development of CSCI level software test documents (e.g. Software Test Plans, Software Test Procedures, Software Test Descriptions) **shall** be different from those personnel responsible for the design and development of that CSCI.
SCSOW1059	2.4.9.0-9	The Contractor **shall** specify, design, review, develop, configuration control, and test the software component of firmware, consisting of computer programs and data loaded into a class of memory not dynamically modifiable by the computer during processing (e.g., Programmable Read Only Memories, Application Specific Integrated Circuits with embedded read only memory, Microcontrollers with embedded read only memory), in the same manner as the flight software.
SCSOW1060	2.4.9.0-10	The Contractor **shall** specify, design, review, develop, configuration control, and test changes to command procedures and mission databases in the same manner as changes to the flight software.
SCSOW411	2.4.9.0-11	The Government will perform an independent assessment of all Field Programmable Gate Arrays (FPGA) designs against the design guidelines contained in 500-PG-8700.2.7 Design of Space Flight Field Programmable Gate Arrays and 500-PG-8700.2.8 FPGA Development Methodology, using the information in the FPGA Design Data Package CDRL.
SCSOW412	2.4.9.0-12	The Contractor **shall** assist the Government's FPGA Independent Assessment, assess all review findings and recommendations, and implement corrective actions to address such findings and recommendations.
SCSOW413	2.4.10	**2.4.10 Magnetometer**
SCSOW414	2.4.10.0-1	The Contractor **shall** design, analyze, and validate the Magnetometer.
SCSOW415	2.4.10.0-2	The Contractor **shall** fabricate, assemble, test, integrate, and verify the Magnetometer.
SCSOW416	2.4.10.0-3	The Contractor **shall** derive flow down requirements for hard and soft permanent magnetic fields for all flight equipment, materials, and tools used in the vicinity of the magnetometer sensors.

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SCSOW417	2.4.10.0-4	The Contractor **shall** develop, validate, verify, and maintain the Level 1b algorithms.
SCSOW418	2.4.10.0-5	The Contractor **shall** deliver Level 1b algorithms.
SCSOW419	2.4.10.0-6	The Contractor **shall** deliver a correction scheme algorithm for use in real-time data processing to correct for any magnetic signature that exceeds magnetometer specification limits.
SCSOW420	2.4.10.0-7	The Contractor **shall** provide all facilities for magnetometer testing.
SCSOW421	2.4.10.0-8	The Contract **shall** conduct a zero field test, at both bench and satellite level testing to determine the magnetometer sensor zero offset.
SCSOW422	2.4.10.0-9	The Contractor **shall** conduct a satellite level stray magnetic field test that demonstrates each individual satellite complies with the stray magnetic field specification.
SCSOW423	2.5	**2.5 GSE**
SCSOW424	2.5.0-1	GSE is defined as Electrical Ground Support Equipment (EGSE), Mechanical Ground Support Equipment (MGSE) and GSE Software.
SCSOW1188	2.5.0-2	The Contractor **shall** design, analyze, and validate all GSE used to develop, integrate, test, and deliver the satellite.
SCSOW1189	2.5.0-3	The Contractor **shall** fabricate, assemble, test, and verify all GSE required to develop and deliver the satellite.
SCSOW425	2.5.0-4	The Contractor **shall** provide configuration control of all GSE hardware and software.
SCSOW426	2.5.0-5	The Contractor **shall** provide notification to the Government of any GSE configuration changes for all GSE that interface with the GFP instruments prior to implementation.
SCSOW427	2.5.0-6	The Contractor **shall** develop and document all GSE interfaces in GSE ICDs.
SCSOW428	2.5.0-7	The Contractor **shall** provide multiple GSE for any simultaneous or parallel spacecraft/satellite activities for all spacecraft on contract.
SCSOW431	2.5.0-8	The Contractor **shall** provide radioactive sources, in accordance with SEISS and EXIS UIIDS for use during satellite I&T.
SCSOW1190	2.5.0-9	The Contractor **shall** provide support to the GFP instrument contractors for GFP instrument GSE maintenance when at the Contractor's facilities
SCSOW432	2.5.1	**2.5.1 MGSE**
SCSOW433	2.5.1.0-1	The Contractor **shall** design, analyze, and validate all MGSE.
SCSOW434	2.5.1.0-2	The Contractor **shall** fabricate, assemble, test, certify, and maintain certification of all MGSE required to deliver the satellite.
SCSOW435	2.5.2	**2.5.2 EGSE**
SCSOW436	2.5.2.0-1	The Contractor **shall** design, analyze, and validate all EGSE.
SCSOW437	2.5.2.0-2	The Contractor **shall** fabricate, assemble, test, certify, and maintain certification of all EGSE required to deliver the satellite.
SCSOW429	2.5.2.0-3	The Contractor **shall** develop Electrical System Test Equipment (ESTE) to provide command, control, and telemetry functions for the satellite during I&T.

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SCSOW430	2.5.2.0-4	The Contractor **shall** deliver one set of ESTE to KSC for use during launch vehicle integration. The ESTE should be returned to the Contractor facility if required.
SCSOW438	2.5.3	**2.5.3 GSE and Simulator Software**
SCSOW439	2.5.3.0-1	The Contractor **shall** develop, validate, verify, and maintain all GSE and simulator software.
SCSOW440	2.5.3.0-2	The Contractor **shall** classify all spacecraft GSE and simulator software as Class C (as defined in NPR 7150.2) software.
SCSOW1114	2.5.3.0-3	The contractor **shall** develop GSE and Simulator software in accordance with the requirements of NPR 7150.2 sections: 2.2, 2.3, 2.4, 3 (all), 4.1, 4.2, 4.3, 4.4.1, 4.4.2, 4.4.3, and 5 (all).
SCSOW1115	2.5.3.0-4	For all Class C software (as defined in NPR 7150.2), the personnel responsible for the development of CSCI level software test documents (e.g. Software Test Plans, Software Test Procedures, Software Test Descriptions) **shall** be different from those personnel responsible for the design and development of that CSCI.
SCSOW443	2.5.3.0-5	The Contractor **shall** deliver the source and executable Class C software code.
SCSOW444	2.5.4	**2.5.4 Simulators**
SCSOW445	2.5.4.0-1	The Contractor **shall** develop, deliver, integrate, test, and maintain all satellite, spacecraft, and GFP instrument interface simulators.
SCSOW446	2.5.4.0-2	The Contractor **shall** document, receive, and integrate the GFP instrument emulators into the satellite simulator.
SCSOW447	2.6	**2.6 I&T**
SCSOW448	2.6.0-1	The Contractor **shall** perform all integration, testing, and verification of the spacecraft bus, spacecraft, and satellite. The GFP instrument contractors will perform Comprehensive Performance Tests (CPT)s and Limited Performance Tests (LPT)s on GFP instruments.
SCSOW449	2.6.0-2	The Contractor **shall** manage the integration and testing of the spacecraft bus, spacecraft, and satellite and support of special testing, satellite to launch vehicle I&T, and ETE Testing.
SCSOW450	2.6.0-3	The Contractor **shall** develop and maintain all plans, procedures, and reports to perform all integration and testing of the spacecraft bus, spacecraft, and satellite.
SCSOW1062	2.6.0-4	The Contractor **shall** accommodate the GFP instrument CPTs, LPTs, and other tests performed during I&T.
SCSOW451	2.6.0-5	The Contractor **shall** provide support required to perform Satellite to Launch Vehicle I&T, including the verification of all Satellite/Launch Vehicle ICD requirements.
SCSOW452	2.6.0-6	The Contractor **shall** perform “safe-to-mate” procedures before mating any connector on the satellite.
SCSOW453	2.6.0-7	The Contractor **shall** ensure that a “safe-to-mate” certification is confirmed prior to applying power.
SCSOW454	2.6.0-8	The Contractor **shall** use calibrated and certified GSE to support integration and testing.
SCSOW455	2.6.0-9	The Contractor **shall** provide Electro Static Discharge (ESD) protection for the spacecraft bus, spacecraft, and satellite.
SCSOW456	2.6.0-10	The Contractor **shall** provide and use bagging for the satellite in addition to the GFP instrument bagging provided by the GFP instrument contractors.

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SCSOW457	2.6.0-11	The Contractor **shall** identify and document any discrepancy that may have an impact on orbital operations.
SCSOW458	2.6.0-12	The Contractor **shall** be responsible for testing, monitoring, and complying with ISO 14644-1 Class conformance during all I&T and launch processing facility operations.
SCSOW459	2.6.1	**2.6.1 Spacecraft I&T**
SCSOW460	2.6.1.0-1	The Contractor **shall** completely test all the onboard fault management system, including safing operations, on the spacecraft prior to implementing the formal baseline CPT of the spacecraft.
SCSOW461	2.6.1.0-2	The Contractor **shall** ensure that following the successful execution of the fault management testing, all non-hazardous safing operations are enabled during subsequent system level tests and CPTs.
SCSOW462	2.6.1.0-3	The Contractor **shall** establish and implement a system for trending and reporting unit/component, subsystem, and spacecraft level performance during I&T.
SCSOW463	2.6.1.0-4	The Contractor **shall** report performance trending results at the PER, and the Satellite PSRs.
SCSOW1209	2.6.1.0-5	The Contractor **shall** develop and document the Safe-To-Mate test procedure for the electrical integration of each subsystem, Auxiliary Communications Service, and Magnetometer to the spacecraft bus.
SCSOW464	2.6.2	**2.6.2 Satellite I&T**
SCSOW465	2.6.2.0-1	The Contractor **shall** perform the integration of the GFP instruments onto the spacecraft.
SCSOW466	2.6.2.0-2	The Contractor **shall** organize working groups for each environmental test activity with membership consisting of Contractor, Government, and GFP instrument representatives.
SCSOW467	2.6.2.0-3	The Contractor **shall** prepare a working group specific Data Package, in a Contractor defined format, and provide that package to the Government no later than 5 business days before the working group.
SCSOW1215	2.6.2.0-4	The Contractor **shall** completely test the onboard fault management system, including safing operations, on the spacecraft prior to integration of the GFP instruments.
SCSOW468	2.6.2.0-5	The Contractor **shall** develop and document the Safe-To-Mate test procedure for the electrical integration of each GFP instrument to the spacecraft in concert with the GFP instrument contractor and the Government.
SCSOW469	2.6.2.0-6	The Contractor **shall** provide the clean room area, office space, and support to each GFP instrument team to aid in the effort associated with the Bench Acceptance Test of each of the GFP instruments after their arrival at the spacecraft I&T facility.
SCSOW470	2.6.2.0-7	The Contractor **shall** mount, align, and verify that GFP instruments have been integrated to the spacecraft according to the GFP instrument ICD.
SCSOW471	2.6.2.0-8	The Contractor **shall** provide a gas purge to the GFP instrument optical cavities during all storage, test, and transport operations if required by the GFP instrument and as specified in the GFP instrument ICD.
SCSOW472	2.6.2.0-9	The Contractor **shall** document the method and procedure of optical alignment of each GFP instrument during all phases of I&T.
SCSOW1167	2.6.2.0-10	The Contractor **shall** measure the optical alignment of each GFP instrument before and after environmental testing.

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SCSOW1063	2.6.2.0-11	The Contractor **shall** support the checkout of instrument operability during all phases of I&T.
SCSOW475	2.6.2.0-12	The Contractor **shall** provide access to each GFP instrument contractor to inspect and clean the GFP instruments as documented in the GFP instrument ICD.
SCSOW476	2.6.2.0-13	The Contractor **shall** ensure that GFP instrument GSE is properly configured (and powered on) prior to any testing of a GFP instrument.
SCSOW477	2.6.2.0-14	The Contractor **shall** allocate and support 30 days dedicated to GFP instrument functional testing prior to the start of environmental testing.
SCSOW1064	2.6.2.0-15	The Contractor **shall** allocate and support 15 days of dedicated GFP instrument test time prior to satellite structural and mechanical verification testing.
SCSOW478	2.6.2.0-16	The Contractor **shall** allocate and support 30 days dedicated to GFP instrument testing during thermal vacuum.
SCSOW1066	2.6.2.0-17	GFP instrument testing time **shall** not include test set-up, spacecraft preparation, and test teardown.
SCSOW479	2.6.2.0-18	The Contractor **shall** provide the required spacecraft orientation and access per GFP instrument test procedures.
SCSOW480	2.6.2.0-19	Spacecraft testing may be conducted in parallel if the Government determines that it does not interfere with, or compromise GFP instrument testing.
SCSOW1174	2.6.2.0-20	The Contractor **shall** accommodate and support GFP instrument testing in parallel with satellite testing, if the Government determines that it does not interfere or compromise satellite testing.
SCSOW481	2.6.2.0-21	The Contractor **shall** document GFP instrument testing and inspection to be accomplished at the launch site in the ICD.
SCSOW482	2.6.2.0-22	The Contractor **shall** align the GFP instrument alignment reference frame to the spacecraft IRU reference frame.
SCSOW483	2.6.2.0-23	The Contractor **shall** measure the alignment between the GFP instrument alignment reference frame and the spacecraft IRU reference frame specified in the ICD.
SCSOW484	2.6.2.0-24	The Contractor **shall** integrate the GFP instrument units onto the spacecraft and apply any interstitial materials as conductive enhancements. Selection and application of any interstitial materials require the concurrence of the GFP instrument contractor and Contractor.
SCSOW485	2.6.2.0-25	The Contractor **shall** measure dynamic interactions between spacecraft and GFP instrument units.
SCSOW486	2.6.2.0-26	The Contractor **shall** measure the spacecraft magnetic dipole.
SCSOW487	2.6.2.0-27	The Contractor **shall** measure electromagnetic interactions between the spacecraft and GFP instruments with all communications functions and instruments operating in an on-orbit mode.
SCSOW488	2.6.2.0-28	The Contractor **shall** define, analyze, and document the requirements for all environmental tests associated with the spacecraft and GFP instruments.
SCSOW489	2.6.2.0-29	The Contractor **shall** define each test, provide facilities, prepare tests, and operate each environmental test as defined in the Spacecraft F&PS.
SCSOW490	2.6.2.0-30	The Contractor **shall** accommodate GFP instrument requirements for environmental testing by providing testing periods prior to, during, and after each environmental test.
SCSOW1175	2.6.2.0-31	The Contractor **shall** accommodate GFP instrument LPTs between satellite vibration tests of each axis.

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SCSOW491	2.6.2.0-32	The Contractor **shall** conduct test data reviews within 5 business days with the Government after each major test event.
SCSOW492	2.6.2.0-33	The Contractor **shall** provide all purge gases for use by the GFP instruments as documented in each GFP instruments ICD.
SCSOW493	2.6.2.1	**2.6.2.1 Special Testing**
SCSOW495	2.6.2.1.0-1	The Contractor **shall** provide wideband data generated and recorded during all CPTs.
SCSOW496	2.6.2.1.0-2	The Contractor **shall** perform a Satellite Dynamic Interaction Test.
SCSOW497	2.6.2.1.0-3	The Contractor **shall** perform a Modal Survey Test.
SCSOW498	2.6.2.1.0-4	The Contractor **shall** perform a RF Airlink Test.
SCSOW499	2.6.2.1.0-5	The Contractor **shall** perform a RF Compatibility Test for the Auxiliary Communications
SCSOW500	2.6.2.1.0-6	The Government will provide use of the Compatibility Test Van (CTV).
SCSOW503	2.6.2.2	**2.6.2.2 ETE Testing**
SCSOW504	2.6.2.2.0-1	The GOES-R Program will define a series of satellite-to-ground system ETE tests. The ETE testing will focus on the validation and compatibility of flight and ground hardware, software, and communications interfaces in a mission operations context.
SCSOW505	2.6.2.2.0-2	The Government Mission Operations Support Team (MOST) will manage the execution of the ETE testing.
SCSOW506	2.6.2.2.0-3	The Contractor **shall** provide all resources for and execute five (5) ETE tests for a total duration of 14 days (336 hours).
SCSOW507	2.6.2.2.0-4	The Contractor **shall** support the development and review of ETE test plans and procedures as part of the joint mission operations, spacecraft, GFP instrument, and ground segment teams.
SCSOW508	2.6.2.2.0-5	The Contractor **shall** provide simulation and stimulation sources for ETE tests when emulation of the flight environment is not feasible as determined by the Government.
SCSOW509	2.6.2.2.0-6	The Contractor **shall** obtain approval from the Government before using any simulator in an ETE test configuration.
SCSOW510	2.6.3	**2.6.3 Transportation and Handling**
SCSOW511	2.6.3.0-1	The Contractor **shall** transport the satellite, all spacecraft GSE, all GFP instruments' GSE, and all other required items to and from all test facilities, and to the launch site, safely and in a manner compatible with all applicable environmental specifications and licensing requirements.
SCSOW512	2.6.3.0-2	The Contractor **shall** perform final satellite preparations and checkout at the launch site.
SCSOW513	2.6.3.0-3	The Contractor **shall** provide satellite GSE for integration and testing at the launch processing facility.
SCSOW515	2.6.3.0-4	The Contractor **shall** provide the transportation and handling back to the Contractor's I&T facility of all equipment shipped to the launch site remaining after the launch.
SCSOW516	2.6.3.0-5	The Contractor **shall** design, analyze, and validate all shipping containers for the subsystems, spacecraft, and satellite.
SCSOW517	2.6.3.0-6	The Contractor **shall** provide all shipping containers for subsystems, spacecraft, and the satellite.

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SCSOW518	2.6.4	**2.6.4 Storage**
SCSOW519	2.6.4.0-1	The Contractor **shall** store the satellite and associated GSE for up to five (5) years.
SCSOW520	2.6.4.0-2	The Contractor **shall** provide sustaining engineering during the storage of the satellite.
SCSOW521	2.6.4.0-3	The Contractor **shall** provide testing and refurbishment during storage of the satellite.
SCSOW522	2.6.4.0-4	The Contractor **shall** perform an LPT annually while the satellite is in storage.
SCSOW523	2.6.4.0-5	The Contractor **shall** perform a thermal vacuum test on the satellite if the satellite has been in storage for more than four (4) years.
SCSOW524	2.6.4.0-6	The Contractor **shall** perform a CPT after final removal of the satellite from storage.
SCSOW1067	2.6.4.0-7	The Contractor **shall** bag the spacecraft bus, spacecraft, and satellite during periods when no work is being performed on the hardware for three (3) days or greater.
SCSOW525	2.7	**2.7 Launch and Operations**
SCSOW526	2.7.0-1	The Contractor **shall** provide all resources to analyze, plan, perform, coordinate, and document all phases of launch operations for the satellite from arrival at the range through launch, including satellite servicing in the event of mission abort.
SCSOW527	2.7.1	**2.7.1 Satellite / Launch Vehicle I&T**
SCSOW528	2.7.1.0-1	The Contractor **shall** provide support to the Government for the development of GFP LV contract launch base requirements documents, which include but are not limited to the Program Requirements Document (PRD), Launch Site Support Plan (LSSP), satellite test plans and procedures, and Launch Base Payload Processing Requirements Document (PPRD).
SCSOW529	2.7.1.0-2	The Contractor **shall** provide support for all activities associated with satellite to launch vehicle integration. This includes, but is not limited to: interface verification, integrated Satellite/Launch Vehicle test plan and procedure development, satellite to launch vehicle integration operations, ground processing facilities and GSE integration/readiness, and launch support efforts.
SCSOW1068	2.7.1.0-3	The Contractor **shall** allocate and support 15 days of dedicated GFP instrument test during satellite/launch vehicle I&T.
SCSOW530	2.7.1.0-4	The Contractor **shall** perform CPTs at the launch processing facility as defined in the Satellite Integration & Test Plan.
SCSOW531	2.7.1.0-5	The Contractor **shall** perform LPTs after mating to the launch vehicle as defined in the Satellite Integration & Test Plan.
SCSOW532	2.7.1.0-6	The Contractor **shall** provide personnel, fueling GSE, and perform satellite fueling.
SCSOW1069	2.7.1.0-7	The Government will procure launch services through NASA KSC.
SCSOW1109	2.7.1.0-8	The government will provide the Launch Base PPF for Satellite Launch Base I&T through the GFE Launch Services Contract.
SCSOW533	2.7.1.0-9	The Launch Service Provider will provide fuel, oxidizer, pressurant, and personnel equipment.
SCSOW1070	2.7.1.0-10	The Launch Service Provider will provide the Spacecraft to Launch Vehicle Mating Adapter and Separation System.
SCSOW534	2.7.2	**2.7.2 Flight Operations**

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SCSOW535	2.7.2.0-1	The Contractor **shall** provide flight operations support for the satellite from launch through L+ 180 days or the completion of orbital activation and performance verification, whichever is longer.
SCSOW536	2.7.2.0-2	The Contractor **shall** establish and maintain a Flight Operations Office (FOO) responsible for the management activities associated with the satellite flight operations.
SCSOW1082	2.7.2.0-3	The Contractor **shall** support MOST activities, which will be led by a Government Mission Operations Manager (MOM).
SCSOW1222	2.7.2.0-4	The Contractor **shall** support six (6) simulations to be conducted by the MOST at the NOAA Satellite Operations Facility (NSOF).
SCSOW537	2.7.2.0-5	The FOO **shall** be responsible for coordinating information exchange between the satellite development activities and the MOST.
SCSOW538	2.7.2.0-6	The FOO **shall** be responsible for planning, reporting, development of operations review presentations, oversight of flight operations activities, and providing technical operations support for technical reviews.
SCSOW539	2.7.2.0-7	The Contractor **shall** provide flight operations support at the NOAA SOCC from LRD-12 months until acceptance of the satellite by the Government.
SCSOW540	2.7.2.0-8	The Contractor **shall** provide reference materials and support in the development of flight operations and ground procedures, satellite and ground system testing, and performance verification of all products and deliverables for launch, satellite performance verification, storage, and nominal and contingency operations.
SCSOW541	2.7.2.0-9	The Contractor **shall** ensure the launch and early orbit activation / performance verification engineering team are present at the NOAA SOCC for all launch and mission rehearsals in order to receive training and certification for launch operations.
SCSOW542	2.7.2.0-10	The Contractor **shall** provide operations support 24 hours per day, 7 days per week until the satellite has completed all deployments and all maneuvers to reach its test orbital location.
SCSOW543	2.7.2.0-11	The Contractor **shall** support the MOST, which is operating the satellite from the NOAA SOCC consoles through satellite performance verification.
SCSOW544	2.7.2.0-12	The Contractor **shall** use the existing GOES Incident Report (GIR) system for reporting pre- and post-launch incidents and discrepancies for the flight segment. The GIR system will be utilized by both the flight and ground segments for the GOES-R series.
SCSOW545	2.7.3	**2.7.3 Operations Training**
SCSOW546	2.7.3.0-1	The Contractor **shall** provide ten (10) three-day training sessions for all aspects of operation of the satellite and simulators, including software.
SCSOW547	2.7.3.0-2	The Contractor **shall** provide all training materials for the operations of the spacecraft, GFP instruments, and the satellite simulator.
SCSOW548	2.7.3.0-3	The Contractor **shall** record and provide a DVD of each type of training session.
SCSOW549	2.7.3.0-4	The Contractor **shall** perform a minimum of three (3) Launch Countdown rehearsals, during launch site processing, which include the introduction of simulated anomalies, launch countdown abort, hold, and recycle events.
SCSOW550	2.7.4	**2.7.4 Simulator Maintenance**

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SCSOW551	2.7.4.0-1	The Contractor **shall** operate and maintain the satellite simulator at the NOAA SOCC until the completion of orbital checkout of the satellite.
SCSOW552	2.7.4.0-2	The Contractor **shall** maintain and repair any simulator within 24-hours of being reported for the delivered simulators from LRD-5 months to L+180 days or the completion of orbital activation and checkout, whichever is longer.
SCSOW553	2.7.4.0-3	The Contractor **shall** repair any simulator within 72-hours of being reported for the delivered simulators from the completion of orbital checkout through the duration of the mission.
SCSOW554	2.7.4.0-4	The Contractor **shall** provide all maintenance for the delivered simulators from the completion of orbital checkout through the duration of the mission life (deactivation of the GOES-R series).
SCSOW555	2.8	**2.8 Post Acceptance Support**
SCSOW1204	2.8.0-1	The Contractor **shall** provide sustaining engineering for the fifteen (15) years of the satellite life.
SCSOW557	2.8.0-2	Sustaining Engineering **shall** include, but is not limited to advising the Government on a continual basis, satellite trend and performance analyses, and satellite operations support during satellite anomaly investigation and resolution or contingency operations.
SCSOW558	2.8.0-3	The Contractor **shall** investigate, resolve, and implement corrective action for satellite anomalies.
SCSOW559	2.8.0-4	The Contractor **shall** provide support for decommissioning the satellite.
SCSOW560	2.9	**2.9 Special Studies & Tasks**
SCSOW561	2.9.0-1	The Contractor **shall** perform special studies and tasks as directed by the Government.
SCSOW562	2.9.0-2	The studies and tasks will be requested on a task order basis as directed by the Contracting Officer.
SCSOW563	2.10	**2.10 Education and Public Outreach**
SCSOW564	2.10.0-1	The Contractor **shall** furnish all resources necessary to develop and implement an education and public outreach program for the GOES-R series, including but not limited to posters, K-12 student teacher programs, and training aides.

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SCSOW565	3	# 3 Spacecraft #2
SCSOW566	3.0-1	The Contractor **shall** develop and deliver a spacecraft bus, spacecraft, and satellite designated as GOES-S.
SCSOW567	3.0-2	The effort **shall** include design, analyses, validation, fabrication, assembly, test, verification, maintenance, storage, delivery and post-acceptance support through the life of the mission.
SCSOW568	3.1	## 3.1 Program Management
SCSOW569	3.1.0-1	The Contractor **shall** continue to perform the direct management functions, providing a management structure responsible for overall project control, ensuring that all requirements of this contract and all attachments continue to be accomplished within cost and on schedule.
SCSOW570	3.1.1	### 3.1.1 Program Management Office
SCSOW571	3.1.1.0-1	The Contractor **shall** continue to perform the direct management functions and provide a management structure responsible for overall project control to assure that all requirements of this contract and all attachments are accomplished within cost and on schedule.
SCSOW572	3.1.1.0-2	The Contractor **shall** continue to maintain a PMO responsible for the leadership and overall direction of all phases of the work specified in this SOW.
SCSOW573	3.1.1.0-3	The Contractor **shall** continue to provide a full-time Program Manager through the acceptance of the final satellite.
SCSOW574	3.1.1.0-4	The Program Manager **shall** have corporate authority to assure that the contract cost, schedule and technical requirements are fully met.
SCSOW575	3.1.1.0-5	The Contractor **shall** continue to maintain communication with the Government through the COTR that includes, but is not limited to, e-mail and telephone contact, weekly telecons with the Government team, and one-on-one contact between the Government and Contractor discipline engineers, to be coordinated by the COTR. The Government will provide a list of project personnel authorized to communicate with the Contractor.
SCSOW576	3.1.1.0-6	The Contractor **shall** continue to maintain a Subcontract Management and Control System which provides technical direction and sub-contract management to ensure performance, cost, and schedule requirements are accomplished.
SCSOW578	3.1.1.0-7	The Contractor **shall** continue to upload the MAID to the Portal and send notification to the NASA document manager and COTR.
SCSOW579	3.1.1.0-8	The Contractor **shall** continue to provide access to the MAID through a Contractor provided secure web site that is available to the Government at all times.
SCSOW581	3.1.1.0-9	The Contractor **shall** continue to retain all documents and test data for a minimum of 6 years after contract completion and deliver a copy to the COTR.
SCSOW582	3.1.1.0-10	The Contractor **shall** continue to plan for and implement team building and training activities with the Government in conjunction with reviews and meetings.
SCSOW583	3.1.1.0-11	The Contractor **shall** continue to establish Working Groups for the resolution of issues or to facilitate I&T planning activities at the Government's request.
SCSOW584	3.1.1.0-12	The Contractor **shall** establish a charter for each working group which specifies the group's objective, membership, and meeting schedule.

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SCSOW1071	3.1.1.0-13	The Contractor **shall** prepare a working group specific Data Package, in a Contractor defined format, and provide that package to the Government no later than 5 business days before the working group meets.
SCSOW585	3.1.1.0-14	The Contractor **shall** dissolve Working Groups once the objective of the group has been accomplished to the satisfaction of the Government.
SCSOW587	3.1.2	## 3.1.2 Resource Management
SCSOW588	3.1.2.0-1	The Contractor **shall** continue to maintain the RMS for planning, authorizing, analyzing, and controlling the total resource effort for each WBS element, by spacecraft, and for tracking and reporting manpower, materials, cost, schedule, travel, and subcontract performance.
SCSOW589	3.1.2.0-2	The RMS **shall** continue to be consistent with the contract WBS and provide timely and traceable incorporation of contract changes, and document the effect on the resource management baseline.
SCSOW590	3.1.2.0-3	The Contractor **shall** continue to use the RMS to provide traceable incorporation of contract changes and document the effect on the resource management baseline.
SCSOW591	3.1.2.0-4	The Contractor **shall** continue to include within this WBS element at a minimum, all sub-elements described in applicable document 417-R-SCWBS-0060; Flight Project, Spacecraft, WBS Dictionary. This will assist the Government in organizing, describing, and reporting the design, analyses, fabrication, assembly, integration, testing, and operation of the GOES-R satellite.
SCSOW592	3.1.2.0-5	The Contractor **shall** continue to track non-recurring and recurring costs separately.
SCSOW593	3.1.2.0-6	The Contractor **shall** continue to track schedule and cost data for all design and analyses.
SCSOW594	3.1.2.0-7	The Contractor **shall** continue to track schedule and cost data for all fabrication, assembly, test, and verification.
SCSOW595	3.1.2.0-8	The Contractor **shall** continue to organize and report schedule and cost data for design and analyses separately from fabrication, assembly, test, and verification.
SCSOW596	3.1.2.0-9	The Contractor **shall** continue to utilize a scheduling tool for the generation and reporting of project schedules that is compatible with the latest version of Microsoft Project.
SCSOW1083	3.1.2.0-10	The Contractor **shall** continue to implement the EVMS by which cost and schedule performance can be tracked and reported monthly in EVMS Reports.
SCSOW597	3.1.2.1	### 3.1.2.1 CM
SCSOW598	3.1.2.1.0-1	The Contractor **shall** continue to manage the generation, configuration control, and distribution of all requirements, documents, data, drawings, software, and hardware to develop and deliver all GOES-R series satellites.
SCSOW599	3.1.2.1.0-2	The Contractor **shall** control changes to each GOES-R series satellite separately.
SCSOW600	3.1.2.1.0-3	The Contractor **shall** continue to maintain a Government approved CM System that provides control of configured items, all flight hardware and software, all GSE hardware and software, and all documentation developed under this contract.
SCSOW601	3.1.2.1.0-4	The Contractor **shall** review all applicable changes to configuration controlled documents managed by the Government in order to determine their feasibility and provide the Government with the estimated impact with respect to performance, schedule, and cost.

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SCSOW602	3.1.2.1.0-5	The Contractor **shall** continue to post to the Portal, as generated or changed, all technical and programmatic documentation generated on the contract that includes but is not limited to, letters, contractual documents, CDRL, system engineering reports, design memos, internal technical memoranda, schematics, design specifications, test, and verification procedures.
SCSOW603	3.1.2.1.0-6	The Government will post Government deliverables and technical documentation generated in support of this contract on the Portal.
SCSOW604	3.1.2.1.0-7	The Contractor **shall** continue to notify the selected Government personnel by e-mail that a document has been posted on the website. The Government will provide similar notification to the Contractor.
SCSOW605	3.1.2.1.0-8	The Contractor **shall** continue to maintain a Software CM System that provides baseline management and control of software requirements, design, source code, build files, data, and documentation.
SCSOW606	3.1.2.1.0-9	The Contractor **shall** continue to employ a software source code version control tool to check in/check out current or previous versions of a source file.
SCSOW607	3.1.2.1.0-10	The Contractor **shall** continue to maintain the CCB(s) to review and approve changes to the prototype and flight models, software, GSE, and all controlled documents.
SCSOW611	3.1.2.2	**3.1.2.2 Information Technology Management**
SCSOW612	3.1.2.2.0-1	The Contractor **shall** continue to provide all the information technology resources and support all work required by this contract.
SCSOW613	3.1.2.2.0-2	The Contractor **shall** continue to maintain a joint Contractor/Government working group to define acceptable requirements and methods for GOES-R series data systems. These systems include access via the internet, provisions for protected email, transmission of all Contractor, subcontractor, vendor proprietary data, ITAR/Export Controlled information, Government For Official Use Only information, and NASA unclassified sensitive information between program elements and facilities.
SCSOW614	3.1.2.2.0-3	The Government will establish and maintain a secure website, accessible by the Contractor and selected Government personnel, for document exchange and collaboration of information.
SCSOW615	3.1.2.2.0-4	The Contractor **shall** continue to maintain a documentation system capable of supporting the transfer of all data and documentation, including schematics, block diagrams, drawings, analyses, plans, procedures, and reports to the Government.
SCSOW616	3.1.2.2.0-5	The Contractor **shall** supply and maintain all hardware and software to support the electronic delivery of CDRL items and other information as required.
SCSOW617	3.1.2.2.0-6	The Contractor **shall** continue to maintain all of the hardware, software, office space, internet access, and operational support for a TDAS which is capable of providing the Government access to spacecraft and integrated instrument raw test data within 24 hours, processed data for analyses purposes, test analyses, and test reports.
SCSOW618	3.1.2.2.0-7	The Contractor **shall** continue to provide the Government with remote access to TDAS, Risk Management Systems, Documentation Systems, and Contractor GOES-R series intranet systems.
SCSOW619	3.1.2.2.0-8	The Contractor **shall** make available via remote access all Contractor and subcontractor documentation, data, analyses, schedules, formal reviews, test reports and other information generated for, or related to the GOES-R series effort, whether deliverable or not, to the Government.
SCSOW620	3.1.2.2.0-9	The Documentation System **shall** provide email notification capability that allows the Government to subscribe and receive email notifications when documents are posted or updated.

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SCSOW621	3.1.2.2.0-10	The Contractor **shall** continue to utilize and maintain video conferencing, telephone conferencing, and internet conferencing at the Contractor's facilities for interaction between the Contractor and the Government.
SCSOW1072	3.1.2.2.0-11	The Contractor **shall** continue a photograph and video effort to document the fabrication, assembly, integration, test, verification, and closeout prior to launch
SCSOW622	3.1.3	**3.1.3 Risk Management**
SCSOW623	3.1.3.0-1	The Contractor **shall** continue to implement and maintain a Risk Management System for identifying, analyzing, planning, tracking, controlling, and communicating the risks.
SCSOW628	3.1.3.0-2	The Contractor **shall** provide access to the Risk List through a Contractor provided secure web site that is available to the Government at any time.
SCSOW629	3.1.3.0-3	The Contractor **shall** communicate status of all the items on the Risk List, in particular primary (red) risks (those having both high probability and high impact/severity) as a minimum at the monthly reviews.
SCSOW630	3.1.3.0-4	The Contractor **shall**, prior to accepting a red risk, request and secure Government concurrence and provide supporting rationale that all mitigation options (within cost, schedule, and technical constraints) have been instituted.
SCSOW631	3.1.3.0-5	The Contractor **shall** retain due date, current status information, and justification for final closure, date closed, and provisions for Government concurrence for items on the Risk List.
SCSOW632	3.1.3.0-6	The Contractor **shall** retain all risk related analyses, documents, and data for the life of the contract.
SCSOW633	3.1.3.0-7	The Contractor **shall** coordinate risks, issues, problems, anomalies, and waivers among the implemented reporting systems.
SCSOW634	3.1.4	**3.1.4 Government Resident Office**
SCSOW635	3.1.4.0-1	The Contractor **shall** continue to provide Government Resident Office support as required and defined in Section 2.1.4 of this SOW.
SCSOW636	3.1.5	**3.1.5 Program Communication**
SCSOW637	3.1.5.0-1	The Contractor **shall** continue to provide the technical and administrative support for all program reviews and joint meetings.
SCSOW638	3.1.5.0-2	Program reviews will be used by the Government as “control gates”. Following the presentation of each review, a program evaluation will be made by the Government to determine if the Contractor has satisfactorily completed all work, and whether there are any program issues or deficiencies.
SCSOW639	3.1.5.0-3	The Contractor **shall** develop and deliver a corrective action plan within 10 days for any issues or deficiencies found during a review.
SCSOW640	3.1.5.0-4	The Contractor **shall** wait for Government approval of a corrective action plan for the issues or deficiencies prior to proceeding with the affected program development.
SCSOW641	3.1.5.0-5	Unless otherwise stipulated, all reviews and meetings will be held at the Contractor's facilities.
SCSOW643	3.1.5.1	**3.1.5.1 Kick-Off Meeting**
SCSOW644	3.1.5.1.0-1	Not required.

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SCSOW645	3.1.5.2	**3.1.5.2 Teleconferences**
SCSOW646	3.1.5.2.0-1	The Contractor **shall** continue to conduct bi-weekly executive teleconferences to present, review and discuss technical, risks, schedule, and cost information and to address MAID items and issues.
SCSOW647	3.1.5.2.0-2	The Contractor **shall** continue to conduct bi-weekly working group teleconferences to review and discuss technical information and to address MAID items and issues.
SCSOW648	3.1.5.2.0-3	Once GFP instrument I&T begins, the Contractor **shall** conduct daily on-site meetings and telecons with the Government team.
SCSOW649	3.1.5.3	**3.1.5.3 PMR**
SCSOW650	3.1.5.3.0-1	The Contractor **shall** continue to prepare monthly PMR data packages for the purpose of reviewing the technical, risk, schedule, and cost status of the contract.
SCSOW651	3.1.5.3.0-2	The PMRs will continue to be held every other month (bi-monthly) alternating between the Government's facility and the Contractor's facility.
SCSOW652	3.1.5.4	**3.1.5.4 TIM**
SCSOW653	3.1.5.4.0-1	The Contractor **shall** continue to conduct TIMs requested by the Government for the purpose of discussing and resolving items of interest.
SCSOW654	3.1.5.4.0-2	The Government will accept requests by the Contractor for TIMs
SCSOW655	3.1.5.4.0-3	If the Contractor conducts TIMs with subcontractors for critical assemblies and subassemblies, the Contractor **shall** provide the Government 10 working days advanced notification so that Government representatives can be present.
SCSOW656	3.1.6	**3.1.6 Design Reviews**
SCSOW657	3.1.6.0-1	The Contractor **shall** prepare and conduct delta Spacecraft Design Reviews.
SCSOW658	3.1.6.0-2	The Government will chair all design reviews with the exception of the subsystem design reviews.
SCSOW659	3.1.6.0-3	The design reviews **shall** cover all modifications and changes to flight and ground hardware, software, integration, testing, and operations for which the Contractor has responsibility.
SCSOW660	3.1.6.0-4	The Contractor **shall** provide the Government with at least 10 working days advance notification so that Government representatives can be present at all design reviews.
SCSOW661	3.1.6.0-5	The Contractor **shall** accommodate attendance by the Government at design reviews.
SCSOW662	3.1.6.0-6	The Contractor **shall** conduct a dry run of each design review, with the Government team in attendance, approximately 2 weeks prior to the review.
SCSOW663	3.1.6.0-7	The Contractor **shall** plan dry runs to be the same duration as the design review.
SCSOW664	3.1.6.0-8	The Contractor **shall** provide the Government with a review data package 10 working days prior to all reviews and dry run reviews.
SCSOW665	3.1.6.0-9	The Contractor **shall** provide responses to RFAs in accordance with the CDRL.
SCSOW666	3.1.6.0-10	The Contractor **shall** document all RFAs in the MAID within 1 week after each review .
SCSOW667	3.1.6.0-11	Each design review **shall** be complete when approved by the Government.

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SCSOW668	3.1.6.0-12	If the Government determines that a follow-up review is required, the Contractor **shall** conduct such review at a time mutually agreed upon by the Government and the Contractor.
SCSOW669	3.1.6.0-13	The Contractor **shall** prepare and conduct all design reviews in compliance with GSFC-STD-1001 and GPR 8700.6A.
SCSOW670	3.1.6.1	**3.1.6.1 Delta SDR**
SCSOW671	3.1.6.1.0-1	Reserved
SCSOW672	3.1.6.2	**3.1.6.2 Delta PDR**
SCSOW673	3.1.6.2.0-1	Reserved
SCSOW674	3.1.6.3	**3.1.6.3 Delta Subsystem PDRs**
SCSOW675	3.1.6.3.0-1	Reserved
SCSOW676	3.1.6.4	**3.1.6.4 Delta Subsystem CDRs**
SCSOW677	3.1.6.4.0-1	The Contractor **shall** conduct delta subsystem CDR reviews if the spacecraft subsystem has been modified.
SCSOW678	3.1.6.4.0-2	The Contractor **shall** chair all subsystem delta CDRs.
SCSOW679	3.1.6.4.0-3	The subsystem review panels **shall** consist of personnel not directly responsible for design or procurement of the hardware under review.
SCSOW680	3.1.6.5	**3.1.6.5 Delta CDR**
SCSOW681	3.1.6.5.0-1	The Contractor **shall** prepare and conduct a delta CDR if the spacecraft design has been modified.
SCSOW682	3.1.6.5.0-2	The Contractor **shall** plan for a two day delta CDR.
SCSOW683	3.1.6.6	**3.1.6.6 Design Modification Reviews**
SCSOW684	3.1.6.6.0-1	Upon Government determination, the Contractor **shall** hold a Design Modification Review for any Class I or Class II CCRs following the delta CDR.
SCSOW685	3.1.6.6.0-2	The Contractor **shall** plan for two days for each delta Design Modification Review.
SCSOW686	3.1.6.7	**3.1.6.7 PER**
SCSOW687	3.1.6.7.0-1	The Contractor **shall** prepare and conduct a PER prior to the start of environmental testing of the each satellite to establish the readiness of the satellite and to evaluate the readiness of the system to support the satellite level environmental test program.
SCSOW688	3.1.6.7.0-2	The Contractor **shall** plan for a three day PER.
SCSOW689	3.1.6.8	**3.1.6.8 Satellite PSR**
SCSOW691	3.1.6.8.0-1	The Contractor **shall** prepare and conduct a PSR prior to shipping the satellite to NASA KSC for launch integration.
SCSOW692	3.1.6.8.0-2	The Contractor **shall** plan for a three day PSR.
SCSOW1220	3.1.6.9	**3.1.6.9 SSR**

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SCSOW690	3.1.6.9.0-1	The Contractor **shall** prepare and conduct an SSR prior to placement of each satellite into storage at the Contractor's facilities.
SCSOW1221	3.1.6.9.0-2	The Contractor **shall** plan for a three day SSR.
SCSOW693	3.1.7	**3.1.7 Miscellaneous Reviews**
SCSOW694	3.1.7.0-1	The Contractor **shall** provide the Government with at least 10 working days advance notification to all reviews.
SCSOW695	3.1.7.0-2	The Contractor **shall** accommodate attendance by the Government at all reviews.
SCSOW696	3.1.7.0-3	The Contractor **shall** provide the Government with a review data package 10 working days prior to all reviews and dry run reviews.
SCSOW699	3.1.7.1	**3.1.7.1 Delta IBR**
SCSOW700	3.1.7.1.0-1	Approximately two months prior to conducting the delta-CDR or beginning substantial fabrication of spacecraft hardware, the Contractor **shall** prepare and conduct a delta IBR that describes their performance measurement baseline for the contract.
SCSOW701	3.1.7.1.0-2	The IBR **shall** include updates to the EVMS plan, time phased expenditure plan, integrated master schedule, resource loading, cost accounts, work packages.
SCSOW702	3.1.7.1.0-3	The IBR **shall** include a review of any changes to the Contractor's earned value assessment and reporting systems.
SCSOW703	3.1.7.1.0-4	The Contractor **shall** plan for a three day (3) IBR, not including action item resolution.
SCSOW704	3.1.7.2	**3.1.7.2 Engineering Peer Reviews**
SCSOW705	3.1.7.2.0-1	The Contractor **shall** continue to implement a program of periodic tabletop engineering peer reviews throughout the development life cycle to identify and address risks, problems, and issues as they arise prior to satellite level reviews in accordance with GPR 8700.6A.
SCSOW706	3.1.7.2.0-2	The Contractor **shall** continue to maintain engineering review teams comprised of technical experts with experience relevant to the technology and requirements.
SCSOW707	3.1.7.2.0-3	The Contractor **shall** ensure for each review that the majority of the review team members are external to the GOES-R series effort.
SCSOW708	3.1.7.3	**3.1.7.3 Software Reviews**
SCSOW709	3.1.7.3.0-1	The Contractor **shall** continue to implement a program of periodic tabletop peer reviews throughout the development life cycle to identify and address risks, problems, and issues as they arise prior to satellite level reviews as defined in the Software Management Plan.
SCSOW710	3.1.7.3.0-2	The Contractor **shall** continue to maintain software review teams comprised of technical experts with experience relevant to the technology and requirements.
SCSOW711	3.1.7.3.0-3	The Contractor **shall** ensure for each review that the majority of the review team members are external to the GOES-R series effort.
SCSOW714	3.1.7.3.1	**3.1.7.3.1 Delta Software Requirement Review**
SCSOW715	3.1.7.3.1.0-1	The Contractor **shall** conduct a delta Software Requirements Review of the Software Requirements Specification for all Class B and Class C software (Class B and C as defined in NPR 7150.2, Software Engineering Requirements).

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SCSOW716	3.1.7.3.1.0-2	The Contractor **shall** conduct the delta Software Requirements Review in conjunction with the delta CDR.
SCSOW717	3.1.7.3.2	**3.1.7.3.2 Delta Software TRR**
SCSOW718	3.1.7.3.2.0-1	The Contractor **shall** conduct a delta software TRR prior to the verification of Class B and Class C software.
SCSOW719	3.1.7.3.3	**3.1.7.3.3 Delta Software Qualification Review**
SCSOW720	3.1.7.3.3.0-1	The Contractor **shall** conduct a delta Software Qualification Review for each version of Class B and Class C software prior to formal release.
SCSOW1187	3.1.7.3.3.0-2	The Contractor **shall** include results of testing and software verification in the delta Software Qualification Review.
SCSOW721	3.1.7.4	**3.1.7.4 Instrument Receiving Reviews**
SCSOW722	3.1.7.4.0-1	The Contractor **shall** prepare and conduct an Instrument Receiving Review in conjunction with each GFP instrument contractor prior to the shipping of the each GFP instrument FM and test equipment from the GFP instrument contractor to the Contractor.
SCSOW1128	3.1.7.4.0-2	The Instrument Readiness Review **shall** establish the readiness of the satellite and include an evaluation of the handling plans and procedures.
SCSOW723	3.1.7.4.0-3	The Contractor **shall** plan for a half-day review or combine this activity with the GFP instrument pre-ship review for each GFP instrument.
SCSOW1084	3.1.7.5	**3.1.7.5 Test Reviews**
SCSOW1088	3.1.7.5.0-1	The Contract **shall** submit a list of test reviews to the Government for approval.
SCSOW1085	3.1.7.5.0-2	The Contractor **shall** prepare and conduct a TRR prior to the start of each of the following I&T events: Regression Testing, GFP Instrument Integration, RF Airlink Testing, Mechanical Environments, EMI/EMC testing, Stray Magnetics Testing, Magnetic Dipole Testing, Mass Properties and Alignment Testing, Spacecraft Thermal Vacuum Testing, and Launch Base Processing.
SCSOW1086	3.1.7.5.0-3	The Contractor **shall** prepare a TRR specific Data Package, in a Contractor defined format, and provide that package to the Government no later than 5 days before the TRR.
SCSOW1087	3.1.7.5.0-4	The Contractor **shall** include sub-assemblies and subcontracted subassemblies as well as instrument level test data in test data reviews.
SCSOW1089	3.1.7.5.0-5	The Contractor **shall** conduct a briefing of the test results following the completion of each major phase and regression test during I&T.
SCSOW1091	3.1.7.5.0-6	The Contractor **shall** prepare and conduct a BOC Review of the interim data and test results prior to the breakdown of any test setup/configurations for the following I&T events: Regression Testing, GFP Instrument Integration, RF Airlink Testing, Mechanical Environments, EMI/EMC Testing, Stray Magnetics Testing, Magnetic Dipole Testing, Mass Properties and Alignment Testing, Spacecraft Thermal Vacuum Testing, and Launch Base Processing.
SCSOW1132	3.1.7.5.0-7	Prior to the breakdown of any test setup, the Government will determine if the test data prove compliance with the requirements being verified by the testing.
SCSOW1092	3.1.7.5.0-8	If the Government determines that the data does not prove to be compliant with the requirements, the Contractor **shall** resolve the non-compliances prior to the breakdown of the test setup.

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SCSOW1093	3.1.7.5.0-9	The Contractor **shall** prepare a BOC specific Data Package available at the BOC meeting, in a Contractor defined format.
SCSOW1094	3.1.7.5.0-10	The Contractor **shall** conduct BOC reviews prior to the shipment of deliverable GSE.
SCSOW1095	3.1.7.5.0-11	The Contractor **shall** prepare and conduct a PTR of the finalized data and test results following the completion of each of the following I&T events: Regression Testing, GFP Instrument Integration, RF Airlink Testing, Mechanical Environments, EMI/EMC Testing, Stray Magnetics Testing, Magnetic Dipole Testing, Mass Properties and Alignment Testing, Spacecraft Thermal Vacuum Testing, and Launch Base Processing.
SCSOW1096	3.1.7.5.0-12	The Contractor **shall** prepare a PTR specific Data Package, in a Contractor defined format, and provide that package to the Government no later than 5 business days before the PTR.
SCSOW1097	3.1.7.6	**3.1.7.6 Satellite Handover Review**
SCSOW1098	3.1.7.6.0-1	The Contractor **shall** prepare and conduct a satellite handover review at the conclusion of on-orbit checkout and prior to Government acceptance.
SCSOW1099	3.1.7.6.0-2	The Contractor **shall** plan for a one-day satellite handover review.
SCSOW724	3.1.8	**3.1.8 Review Support**
SCSOW725	3.1.8.0-1	The Government will be required to conduct or participate in independent and external reviews.
SCSOW726	3.1.8.0-2	The Contractor **shall** provide support to the Government for all independent and standing
SCSOW727	3.1.8.0-3	The Contractor **shall** attend and support GFP instrument design reviews.
SCSOW728	3.1.8.0-4	The Contractor **shall** attend and support ground segment design reviews.
SCSOW729	3.1.8.0-5	The Contractor **shall** support the delta MOR.
SCSOW730	3.1.8.0-6	The Contractor **shall** plan for a three (3) day delta MOR.
SCSOW731	3.1.8.0-7	The Contractor **shall** support the MRR. The MRR is the final approval review by GSFC Center Management that the current GOES mission is ready for launch and operations
SCSOW732	3.1.8.0-8	The Contractor **shall** plan for a one (1) day MRR.
SCSOW733	3.1.8.0-9	The Contractor **shall** support the FRR to be conducted by the Government. The FRR is the final approval review by NASA that the current GOES mission is ready for launch and operations.
SCSOW734	3.1.8.0-10	The Contractor **shall** plan for a one (1) day FRR.
SCSOW735	3.1.8.0-11	The Contractor **shall** support the LRR. The Launch Range conducts the LRR, which is the final review prior to launch that verifies the Launch System and Satellite are ready.
SCSOW736	3.1.8.0-12	The Contractor **shall** plan for a one (1) day LRR.
SCSOW737	3.1.8.0-13	The Contractor **shall** support the delta FOR.
SCSOW738	3.1.8.0-14	The Contractor **shall** plan for a three (3) day delta FOR.
SCSOW739	3.1.8.0-15	The Contractor **shall** support the delta ORR.
SCSOW740	3.1.8.0-16	The Contractor **shall** plan for a three (3) day delta ORR.
SCSOW741	3.1.8.0-17	The Contractor **shall** support the delta Phase III Safety Review at the KSC.

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SCSOW742	3.1.8.0-18	The Contractor **shall** plan for one (1) day for the delta Phase III Safety Review.
SCSOW1176	3.1.8.0-19	The Contractor **shall** provide personnel representing Systems Engineering and Spacecraft I&T, at a minimum, at the GORR held at the PPF.
SCSOW1177	3.1.8.0-20	The Contractor **shall** plan for a one (1) day GORR.
SCSOW1178	3.1.8.0-21	The Contractor **shall** provide personnel representing Systems Engineering and Spacecraft I&T, at a minimum, at two (2) planned GOWG meetings held at the Launch Site.
SCSOW1179	3.1.8.0-22	The Contractor **shall** plan for two (2), one (1) day GOWGs.
SCSOW743	3.2	**3.2 Systems Engineering**
SCSOW744	3.2.1	**3.2.1 Systems Engineering Management**
SCSOW745	3.2.1.0-1	The Contractor **shall** continue to maintain the program-level systems engineering office that directly manages all systems engineering efforts for each spacecraft development.
SCSOW747	3.2.1.0-2	The Government will approve the spacecraft resource budgets.
SCSOW748	3.2.2	**3.2.2 Systems Engineering Support**
SCSOW749	3.2.2.0-1	The Contractor **shall** continue to provide systems engineering to support the design modifications and development of the spacecraft and incorporation of the GFP instruments.
SCSOW750	3.2.2.0-2	The Contractor **shall** analyze the total spacecraft design including performance margins requirements and design approaches to assure achievement of the required spacecraft life, spacecraft operations concept, design integrity, failure modes, intra-system and inter-system compatibility, reliability and maintainability, producibility, safety, survivability, training, testability, and verification.
SCSOW751	3.2.2.0-3	The Contractor **shall** continue to oversee all of the work associated with the development of the spacecraft.
SCSOW752	3.2.3	**3.2.3 System Designs, Analyses and Trades**
SCSOW753	3.2.3.0-1	The Contractor **shall** continue to perform all system studies and trades and risk assessment to develop the design for the spacecraft.
SCSOW754	3.2.4	**3.2.4 Requirements and Specification Generation**
SCSOW755	3.2.4.0-1	The Contractor **shall** continue to implement, and maintain a Systems Engineering Requirements Management System for managing, detailing, organizing, controlling, linking, and verifying the requirements.
SCSOW756	3.2.4.0-2	The Contractor **shall** continue to utilize Telelogic DOORS® requirements management tool to capture, link, trace, analyze, and manage changes to all requirements documentation.
SCSOW757	3.2.4.0-3	The Contractor **shall** continue to perform all systems analyses and systems engineering to derive lower-level performance requirements and develop the spacecraft system specification and design specifications for the spacecraft subsystems.
SCSOW758	3.2.4.0-4	The Contractor **shall** continue to document the allocation of requirements to the lower level specifications, showing the traceability of all requirements including performance and design drivers, and explicitly identifying any derived requirements.
SCSOW759	3.2.4.0-5	The Contractor **shall** validate that the lower level requirements meet the Government Level I requirements.

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SCSOW760	3.2.4.0-6	The Contractor **shall** verify that lower level requirements are met.
SCSOW761	3.2.5	**3.2.5 Performance Verification Plans and Procedures**
SCSOW762	3.2.5.0-1	The Contractor **shall** establish a system performance verification program.
SCSOW1137	3.2.5.0-2	The system performance verification program **shall** document the overall verification strategy, methodology, planning, and implementation.
SCSOW1138	3.2.5.0-3	The system performance verification program **shall** provide traceability from system requirements to launch and end-of-life capability. This will also provide the baseline for tracking on-orbit performance versus pre-launch capability.
SCSOW763	3.2.5.0-4	The Contractor **shall** continue to maintain all plans and procedures to verify that the spacecraft meets all requirements described in the GOES-R Spacecraft F&PS, GIRD, UIIDs, and GFP instrument ICDs.
SCSOW764	3.2.5.0-5	The Contractor **shall** continue to perform and document all analyses of the data and information from the design, development, qualification testing, acceptance testing, compatibility testing, and on-orbit testing of the Contractor's hardware and software which are required to ensure that the GOES-R program will meet its specifications and objectives.
SCSOW765	3.2.5.0-6	The Contractor **shall** continue to map all requirements to specific verification test plans and procedures utilizing the DOORS data base.
SCSOW766	3.2.5.0-7	The Contractor **shall** include in the system level in verification plans and procedures, the development of all verification reports, external reviews, and instrument requirements to be verified.
SCSOW767	3.2.6	**3.2.6 Interface Definition and Control**
SCSOW768	3.2.6.1	**3.2.6.1 Instrument Interfaces**
SCSOW769	3.2.6.1.0-1	The Contractor **shall** continue to perform all systems analyses and engineering to define the spacecraft-to-instrument interfaces.
SCSOW770	3.2.6.1.0-2	The Contractor **shall** continue to maintain the joint Contractor/Government /GFP Instrument Contractor Instrument Interface working group.
SCSOW1180	3.2.6.1.0-3	The Contractor **shall** continue to designate a technical representative for each GFP instrument.
SCSOW1181	3.2.6.1.0-4	The Contractor **shall** continue to negotiate and document changes to the Spacecraft to Instrument ICDs with the respective GFP instrument contractors.
SCSOW1182	3.2.6.1.0-5	The Contractor **shall** continue to negotiate and document, in the Spacecraft to Instrument ICDs, any changes to all requirements not specified in GIRD or UIID.
SCSOW771	3.2.6.1.0-6	The Contractor **shall** continue to maintain a complete set of spacecraft-to-instrument ICDs that meet all the requirements of the GIRD as well as the UIID for each GFP instrument.
SCSOW772	3.2.6.2	**3.2.6.2 Ground Interfaces**
SCSOW773	3.2.6.2.0-1	The Contractor **shall** continue to perform all systems analyses and engineering to define all aspects of the space to ground interfaces.
SCSOW1100	3.2.6.2.0-2	The Contractor **shall** continue a joint Contractor/Government /Ground Contractor Ground Interface working group.

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SCSOW1183	3.2.6.2.0-3	The Contractor **shall** continue to negotiate changes to the space to ground ICDs with the ground segment contractor.
SCSOW1141	3.2.6.2.0-4	The Contractor **shall** continue to provide a technical representative for the ground segment.
SCSOW1142	3.2.6.2.0-5	The Contractor **shall** perform all analyses and tests to verify that the spacecraft meets the interfaces required to ensure instrument INR performance.
SCSOW1143	3.2.6.2.0-6	The Contractor **shall** conduct INR analyses using flight environments and scenarios.
SCSOW1144	3.2.6.2.0-7	The Contractor **shall** conduct and document INR testing using flight-like environments and scenarios.
SCSOW1145	3.2.6.2.0-8	The Contractor **shall** document,provide rationale, and obtain approval from the Government for any non-flight-like INR testing.
SCSOW775	3.2.6.3	### 3.2.6.3 Launch Vehicle Interfaces
SCSOW776	3.2.6.3.0-1	The Contractor **shall** continue to perform all systems analyses and engineering to define all aspects of the spacecraft-to-launch vehicle interface.
SCSOW777	3.2.6.3.0-2	The Contractor **shall** continue to provide technical support and satellite inputs required to develop the Spacecraft/Launch Vehicle ICD.
SCSOW778	3.2.6.3.0-3	The Contractor **shall** continue to provide technical support required to perform Spacecraft to Launch Vehicle I&T, including the verification of all Spacecraft/Launch Vehicle ICD requirements.
SCSOW779	3.2.6.3.0-4	The Contractor **shall** continue to provide technical support and spacecraft data required to develop the Mission Specific Analyses. The Mission Specific Analyses will be performed by the launch service provider. The Mission Specific Analyses will include but are not limited to the PMA, DTO, Performance and Guidance Accuracy Analysis, Trajectory Analysis, PLF Venting Analysis, RF Compatibility Analysis, RF Link Analysis, Spacecraft Separation Analysis, EMI/EMC Analysis, Launch Vehicle Payload Fairing Critical Clearance Analysis, Coupled Loads Analysis, and Integrated Thermal Analysis.
SCSOW780	3.2.6.3.0-5	The Contractor **shall** continue to provide technical support required to evaluate results of all Mission Specific Analyses developed by the launch vehicle contractor.
SCSOW781	3.2.6.3.0-6	The Contractor **shall** continue to provide technical support and spacecraft data required to develop launch base PRDs.
SCSOW785	3.2.7	## 3.2.7 Contamination
SCSOW786	3.2.7.0-1	The Contractor **shall** continue control contamination through all phases of the development and I&T of the satellite.
SCSOW787	3.2.7.0-2	The Contractor **shall** continue to monitor both particulate and molecular contamination for flight articles and facilities from the beginning of the integration activities through the launch of the satellite.
SCSOW788	3.2.7.0-3	The Contractor **shall** continue to perform all processing required to maintain cleanliness at specified levels.
SCSOW789	3.2.7.0-4	The Contractor **shall** continue to accommodate GFP instrument cleaning by the GFP instrument contractors.
SCSOW790	3.2.7.0-5	The Contractor **shall** continue to report all contamination activities and cleanliness verifications in accordance with the approved contamination control plan.

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SCSOW791	3.2.7.0-6	The Contractor **shall** continue to perform a mass transport analyses and a particle generation analyses for the satellite.
SCSOW792	3.2.7.0-7	The Contractor **shall** continue to implement contamination allowances and budgets for performance degradation of satellite optical and thermal contamination-sensitive hardware over the mission lifetime.
SCSOW1101	3.2.7.0-8	The Contractor **shall** incorporate GFP instrument contamination allowances, budgets, and analyses into the satellite contamination analyses.
SCSOW793	3.3	**3.3 S&MA**
SCSOW794	3.3.1	**3.3.1 S&MA Management**
SCSOW795	3.3.1.0-1	The Contractor **shall** continue to execute the mission assurance and verification effort for the spacecraft as documented in the GOES-R SCMAR.
SCSOW796	3.3.2	**3.3.2 Safety**
SCSOW797	3.3.2.0-1	The Contractor **shall** continue to comply with safety requirements for the spacecraft as documented in the SCMAR 417-R-SCMAR-0011 and AFSPCMAN 91-710.
SCSOW798	3.3.3	**3.3.3 Parts Control**
SCSOW799	3.3.3.0-1	The Contractor **shall** continue to perform parts control for the spacecraft as defined in the SCMAR.
SCSOW800	3.3.4	**3.3.4 Materials and Processes Control**
SCSOW801	3.3.4.0-1	The Contractor **shall** continue to comply with the Materials and Processes Control requirements for the spacecraft as defined in the SCMAR.
SCSOW802	3.3.5	**3.3.5 Reliability**
SCSOW803	3.3.5.0-1	The Contractor **shall** continue to comply with the Reliability requirements for the spacecraft as defined in the SCMAR.
SCSOW804	3.3.5.0-2	The Contractor **shall** incorporate updates to the GFP instrument FMEAs and reliability data into the overall spacecraft reliability analyses.
SCSOW805	3.3.6	**3.3.6 Quality Assurance**
SCSOW806	3.3.6.0-1	The Contractor **shall** continue to comply with the Quality Assurance requirements for the spacecraft as defined in the SCMAR.
SCSOW807	3.3.7	**3.3.7 Software Assurance**
SCSOW808	3.3.7.0-1	The Contractor **shall** continue to comply with the Software Assurance requirements for the spacecraft as defined in the NASA-STD-8739.8, Software Assurance Standard.
SCSOW809	3.3.7.1	**3.3.7.1 Software Safety**
SCSOW810	3.3.7.1.0-1	The Contractor **shall** continue to comply with the Software Safety requirements for the spacecraft as defined in the NASA-STD-8719.13B; NASA Software Safety Technical Standard.
SCSOW811	3.3.7.1.0-2	The Contractor **shall** verify all safety-critical software (as defined in NASA-STD-8719.13B) on flight or flight-like hardware.

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SCSOW812	3.3.7.2	**3.3.7.2 Software Verification and Validation**
SCSOW813	3.3.7.2.0-1	The Contractor **shall** continue to implement a Software V&V program to ensure that software being developed, modified, or maintained satisfies functional, performance, and other requirements at each stage of the development process, and that the final product meets customer requirements.
SCSOW817	3.3.7.3	**3.3.7.3 Independent Validation and Verification**
SCSOW818	3.3.7.3.0-1	The Contractor **shall** continue to provide the IV&V personnel access to all software reviews and reports, TIMs, Contractor plans and procedures, software code, software design documentation, and software problem reporting data.
SCSOW1148	3.3.7.3.0-2	The Contractor **shall** furnish copies of requested information to IV&V personnel.
SCSOW819	3.3.7.3.0-3	The Contractor **shall** review and assess all NASA IV&V findings and recommendations and implement corrective actions.
SCSOW820	3.3.7.4	**3.3.7.4 Software Problem Reporting and Corrective Action**
SCSOW821	3.3.7.4.0-1	The Contractor **shall** continue to maintain the process for Software Problem Reporting and Corrective Action that addresses reporting, analyzing, and correcting software non-conformances and software test failures reported in SPRs throughout the development lifecycle.
SCSOW822	3.3.7.4.0-2	The Contractor **shall** continue to provide for a corrective action process that tracks every software nonconformance to its final disposition
SCSOW823	3.4	**3.4 Spacecraft**
SCSOW824	3.4.0-1	The Contractor **shall** design, analyze, validate, fabricate, assemble, integrate, test, verify, support launch, and support on-orbit operations for the spacecraft.
SCSOW826	3.4.0-2	The Contractor **shall** identify and submit to the government for approval, a list critical assemblies and subassemblies.
SCSOW1184	3.4.0-3	The Government will review and approve the list of critical assemblies and subassemblies.
SCSOW827	3.4.1	**3.4.1 Spacecraft Management**
SCSOW828	3.4.1.0-1	The Contractor **shall** continue to perform the direct management functions and provide the management structure to plan, direct, and execute all elements to develop the spacecraft.
SCSOW829	3.4.1.0-2	The Contractor **shall** continue to provide a full-time spacecraft manager through acceptance of the spacecraft.
SCSOW830	3.4.2	**3.4.2 Mechanical**
SCSOW831	3.4.2.0-1	The Contractor **shall** design, analyze, and validate modifications to the mechanical subsystem.
SCSOW832	3.4.2.0-2	The Contractor **shall** fabricate, assemble, test, and verify the mechanical subsystem.
SCSOW833	3.4.2.0-3	Unless otherwise specified, the Contractor **shall** provide all mounting hardware for the instrument units.
SCSOW834	3.4.2.0-4	The Contractor **shall** maintain an integrated satellite mechanical model which includes all instrument and spacecraft mechanical models.
SCSOW835	3.4.3	**3.4.3 Thermal**

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SCSOW836	3.4.3.0-1	The Contractor **shall** design, analyze, and validate modifications to the thermal subsystem.
SCSOW837	3.4.3.0-2	The Contractor **shall** fabricate, assemble, test, and verify the thermal subsystem.
SCSOW839	3.4.3.0-3	The Contractor **shall** integrate all GFP instrument and spacecraft thermal models into a satellite thermal model.
SCSOW840	3.4.4	**3.4.4 GN&C**
SCSOW841	3.4.4.0-1	The Contractor **shall** design, analyze, and validate modifications to the GN&C subsystem.
SCSOW842	3.4.4.0-2	The Contractor **shall** fabricate, assemble, test, and verify the GN&C subsystem.
SCSOW843	3.4.5	**3.4.5 C&DH**
SCSOW844	3.4.5.0-1	The Contractor **shall** design, analyze, and validate modifications to the C&DH subsystem.
SCSOW845	3.4.5.0-2	The Contractor **shall** fabricate, assemble, test, and verify the C&DH subsystem.
SCSOW941	3.4.5.0-3	The Contractor **shall** integrate the GFP instrument contractors' telemetry, commands, and limits databases into the satellite telemetry and command database.
SCSOW846	3.4.5.1	**3.4.5.1 C&DH Harnesses**
SCSOW847	3.4.5.1.0-1	The Contractor **shall** design, analyze, and validate any modifications to the C&DH harnesses and cables.
SCSOW1103	3.4.5.1.0-2	The Contractor **shall** fabricate, assemble, test, and verify the C&DH harnesses and cables.
SCSOW848	3.4.6	**3.4.6 COMM**
SCSOW849	3.4.6.0-1	The Contractor **shall** design, analyze, and validate modifications to the COMM subsystem and the Auxiliary Communication Services including the encryption and decryption of the communication interface.
SCSOW850	3.4.6.0-2	The Contractor **shall** fabricate, assemble, test, and verify the COMM subsystem and the Auxiliary Communication Services including the encryption and decryption of the communication interface.
SCSOW851	3.4.6.1	**3.4.6.1 COMM Harnesses**
SCSOW852	3.4.6.1.0-1	The Contractor **shall** design, analyze, and validate modifications to the COMM harnesses and cables.
SCSOW1075	3.4.6.1.0-2	The Contractor **shall** fabricate, assemble, test, and verify the COMM harnesses and cables.
SCSOW853	3.4.7	**3.4.7 Power**
SCSOW854	3.4.7.0-1	The Contractor **shall** design, analyze, and validate modifications to the power subsystem.
SCSOW855	3.4.7.0-2	The Contractor **shall** fabricate, assemble, test, and verify the power subsystem.
SCSOW856	3.4.7.1	**3.4.7.1 Battery**
SCSOW857	3.4.7.1.0-1	The Contractor **shall** design, analyze, and validate modifications to the spacecraft batteries.
SCSOW1076	3.4.7.1.0-2	The Contractor **shall** fabricate, assemble, test, and verify the spacecraft batteries.
SCSOW858	3.4.7.1.0-3	The Contractor **shall** develop one (1) flight battery built to flight design specifications and subject it to environmental acceptance testing.

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SCSOW859	3.4.7.1.0-4	The Contractor **shall** develop one (1) flight spare battery built to flight design specifications and subject it to environmental acceptance testing.
SCSOW861	3.4.7.1.0-5	The Contractor **shall** provide all analyses, life test data, qualification test data, and acceptance test data for both the battery cells and battery to assist the government in determining compliance with the battery requirements.
SCSOW862	3.4.7.1.0-6	The Contractor **shall** provide the cell lot acceptance criteria and the supporting test data for each cell in the lot to assist the government in determining compliance with the battery requirements.
SCSOW863	3.4.7.1.1	**3.4.7.1.1 Battery Qualification**
SCSOW864	3.4.7.1.1.0-1	Not required.
SCSOW865	3.4.7.1.2	**3.4.7.1.2 Battery Life Testing**
SCSOW866	3.4.7.1.2.0-1	The Contractor **shall** continue to perform battery life testing.
SCSOW1185	3.4.7.1.2.0-2	The life test battery **shall** consist of the flight components and material.
SCSOW1186	3.4.7.1.2.0-3	If cell voltage balancing is planned for flight, the life test battery **shall** incorporate the flight voltage balancing electronics and its planned flight use into the battery life testing.
SCSOW867	3.4.7.1.2.0-4	The Contractor **shall** continue to analyze and document the results of the battery life testing.
SCSOW868	3.4.7.2	**3.4.7.2 Solar Array**
SCSOW869	3.4.7.2.0-1	The Contractor **shall** design, analyze, and validate modifications to the solar array.
SCSOW1077	3.4.7.2.0-2	The Contractor **shall** fabricate, assemble, test, and verify the solar array.
SCSOW1212	3.4.7.2.0-3	The Contractor **shall** perform an LPT on each solar array if stored for greater than 1 year.
SCSOW870	3.4.7.3	**3.4.7.3 Power Regulation and Conditioning**
SCSOW871	3.4.7.3.0-1	The Contractor **shall** design, analyze, and validate modifications to the power regulation and conditioning.
SCSOW1078	3.4.7.3.0-2	The Contractor **shall** fabricate, assemble, test, and verify the power regulation and conditioning.
SCSOW872	3.4.7.4	**3.4.7.4 Power Harnesses**
SCSOW873	3.4.7.4.0-1	The Contractor **shall** design, analyze, and validate modifications to the power harnesses and cables.
SCSOW1079	3.4.7.4.0-2	The Contractor **shall** fabricate, assemble, test, and verify the power harnesses and cables.
SCSOW874	3.4.8	**3.4.8 Propulsion**
SCSOW875	3.4.8.0-1	The Contractor **shall** design, analyze, and validate modifications to the propulsion subsystem.
SCSOW876	3.4.8.0-2	The Contractor **shall** fabricate, assemble, test, and verify the propulsion subsystem.
SCSOW877	3.4.9	**3.4.9 Flight Software**
SCSOW878	3.4.9.0-1	The Contractor **shall** develop, verify, and maintain all aspects of flight software.
SCSOW879	3.4.9.0-2	The Contractor **shall** classify all spacecraft flight software as Class B software as defined in NPR 7150.2, Software Engineering Requirements.

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SCSOW1116	3.4.9.0-3	The contractor **shall** continue to develop flight software in accordance with the requirements of NPR 7150.2 sections: 2.2, 2.3, 2.4, 3 (all), 4.1, 4.2, 4.3, 4.4.1, 4.4.2, 4.4.3, and 5 (all).
SCSOW1117	3.4.9.0-4	The contractor **shall** continue to conduct an Unused Code Analysis, as specified in Section 8.5.4 of NASA Guidebook 8719.13B, for any flight qualified Class B software.
SCSOW880	3.4.9.0-5	The Contractor **shall** continue to support verification and validation testing of all flight software.
SCSOW881	3.4.9.0-6	The Contractor **shall** continue to maintain one FSDE, including hardware, software, procedures, and associated documentation, to be used for the life cycle management, development, and verification of the flight software at the Contractor's facility.
SCSOW882	3.4.9.0-7	The Contractor **shall** continue to maintain one FSDE, including hardware, software, procedures, and associated documentation for delivery to the Government for development, test, and verification of software patches that may be required throughout the operational phase of the mission.
SCSOW883	3.4.9.0-8	The Contractor **shall** deliver the source and executable flight software code if any modifications have been implemented.
SCSOW1118	3.4.9.0-9	For all Class B software (as defined in NPR 7150.2), the personnel responsible for the development of CSCI level software test documents (e.g. Software Test Plans, Software Test Procedures, Software Test Descriptions) **shall** be different from those personnel responsible for the design and development of that CSCI.
SCSOW1119	3.4.9.0-10	The Contractor **shall** specify, design, review, develop, configuration control, and test the software component of firmware, consisting of computer programs and data loaded into a class of memory not dynamically modifiable by the computer during processing (e.g., Programmable Read Only Memories, Application Specific Integrated Circuits with embedded read only memory, Microcontrollers with embedded read only memory), in the same manner as the flight software.
SCSOW1121	3.4.9.0-11	The Contractor **shall** specify, design, review, develop, configuration control, and test changes to command procedures and mission databases in the same manner as changes to the flight software.
SCSOW884	3.4.9.0-12	The Government will perform an independent assessment of all modified FPGA designs against the design guidelines contained in 500-PG-8700.2.7: Design of Space Flight Field Programmable Gate Arrays and 500-PG-8700.2.8 FPGA Development Methodology, using the information in the FPGA Design Data Package CDRL.
SCSOW885	3.4.9.0-13	The Contractor **shall** continue to assist the Government's FPGA Independent Assessment, assess all review findings and recommendations, and implement corrective actions to address such findings and recommendations.
SCSOW886	3.4.10	**3.4.10 Magnetometer**
SCSOW887	3.4.10.0-1	The Contractor **shall** design, analyze, and validate modifications to the Magnetometer.
SCSOW888	3.4.10.0-2	The Contractor **shall** fabricate, assemble, test, integrate, and verify the Magnetometer.
SCSOW889	3.4.10.0-3	The Contractor **shall** derive flow down requirements for hard and soft permanent magnetic fields for all flight equipment, materials, and tools used in the vicinity of the magnetometer sensors.
SCSOW890	3.4.10.0-4	The Contractor **shall** continue to maintain any modified Level 1b algorithms.
SCSOW891	3.4.10.0-5	The Contractor **shall** deliver any modified correction scheme algorithm for use in real-time data processing to correct for any magnetic signature that exceeds magnetometer specification limits.
SCSOW892	3.4.10.0-6	The Contractor **shall** continue to provide all facilities for magnetometer testing.

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SCSOW893	3.4.10.0-7	The Contract **shall** conduct a zero field test, at both bench and satellite level testing, of magnetometer sensor zero offset.
SCSOW894	3.4.10.0-8	The Contractor **shall** conduct a satellite level stray magnetic field test that demonstrates each individual spacecraft complies with the stray magnetic field specification.
SCSOW895	3.5	**3.5 GSE**
SCSOW896	3.5.0-1	The Contractor **shall** design, analyze, and validate modifications to all GSE used to develop, integrate, test, and deliver the satellite.
SCSOW897	3.5.0-2	The Contractor **shall** fabricate, assemble, test, and verify all GSE required to develop and deliver the satellite.
SCSOW898	3.5.0-3	The Contractor **shall** continue to provide configuration control of all GSE hardware and software.
SCSOW899	3.5.0-4	The Contractor **shall** provide notification to the Government of any GSE configuration changes for all GSE that interface with the GFP instruments prior to implementation.
SCSOW900	3.5.0-5	The Contractor **shall** continue to maintain and document all GSE interfaces in GSE ICDs.
SCSOW901	3.5.0-6	The Contractor **shall** continue to provide multiple GSE for any simultaneous or parallel spacecraft/satellite activities for all spacecraft on contract.
SCSOW904	3.5.0-7	The Contractor **shall** continue to provide radioactive sources, in accordance with SEISS and EXIS UIIDS for use during satellite I&T.
SCSOW1191	3.5.0-8	The Contractor **shall** continue to provide support to the GFP instrument contractors for GFP instrument GSE maintenance when at the Contractor's facilities
SCSOW1155	3.5.1	**3.5.1 MGSE**
SCSOW1156	3.5.1.0-1	The Contractor **shall** design, analyze, and validate all modifications to MGSE.
SCSOW1157	3.5.1.0-2	The Contractor **shall** fabricate, assemble, test, certify, and maintain certification of all MGSE required to deliver the satellite.
SCSOW1162	3.5.2	**3.5.2 EGSE**
SCSOW1163	3.5.2.0-1	The Contractor **shall** design, analyze, and validate all modificatons to EGSE.
SCSOW1164	3.5.2.0-2	The Contractor **shall** fabricate, assemble, test, certify, and maintain certification of all EGSE required to the deliver the satellite.
SCSOW902	3.5.2.0-3	The Contractor **shall** continue to maintain the ESTE and provide command, control, and telemetry funtions for the satellite during I&T.
SCSOW903	3.5.2.0-4	The Contractor **shall** deliver one set of ESTE to KSC for use during launch vehicle integration. The ESTE should be returned to the Contractor facility if required.
SCSOW905	3.5.3	**3.5.3 GSE and Simulator Software**
SCSOW906	3.5.3.0-1	The Contractor **shall** continue to develop, verify, and maintain all non-flight software.
SCSOW907	3.5.3.0-2	The Contractor **shall** classify all spacecraft GSE and simulator software as Class C (as defined in NPR 7150.2) software.
SCSOW1122	3.5.3.0-3	The contractor **shall** develop GSE and Simulator software in accordance with the requirements of NPR 7150.2 sections: 2.2, 2.3, 2.4, 3 (all), 4.1, 4.2, 4.3, 4.4.1, 4.4.2, 4.4.3, and 5 (all).

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SCSOW1123	3.5.3.0-4	For all Class C software (as defined in NPR 7150.2), the personnel responsible for the development of CSCI level software test documents (e.g. Software Test Plans, Software Test Procedures, Software Test Descriptions) **shall** be different from those personnel responsible for the design and development of that CSCI.
SCSOW910	3.5.3.0-5	The Contractor **shall** deliver the source and executable Class C software code.
SCSOW911	3.5.4	## 3.5.4 Simulators
SCSOW912	3.5.4.0-1	The Contractor **shall** continue to test, maintain, and modify all satellite, spacecraft, and GFP instrument interface simulators.
SCSOW913	3.5.4.0-2	The Contractor **shall** document, receive, and integrate the modified GFP instrument emulators into the satellite simulator.
SCSOW914	3.6	## 3.6 I&T
SCSOW915	3.6.0-1	The Contractor **shall** perform all integration, testing, and verification of the spacecraft bus, spacecraft, and satellite except for GFP instrument CPTs and LPTs performed by the GFP instrument contractors.
SCSOW916	3.6.0-2	The Contractor shall continue to manage the integration and testing of the spacecraft bus, spacecraft, and satellite and support of special testing, satellite to launch vehicle I&T, and ETE Testing.
SCSOW917	3.6.0-3	The Contractor **shall** continue to develop, modify, and maintain all plans, procedures, and reports to perform all integration and testing of the spacecraft bus, spacecraft, and satellite.
SCSOW1192	3.6.0-4	The Contractor **shall** continue to accommodate the GFP instrument CPTs, LPTs, and other tests performed during I&T.
SCSOW918	3.6.0-5	The Contractor **shall** continue to provide support required to perform Satellite to Launch Vehicle I&T, including the verification of all Satellite/Launch Vehicle ICD requirements.
SCSOW919	3.6.0-6	The Contractor **shall** perform “safe-to-mate” procedures before mating any connector on the spacecraft.
SCSOW920	3.6.0-7	The Contractor **shall** ensure that a “safe-to-mate” certification is confirmed prior to applying power.
SCSOW921	3.6.0-8	The Contractor **shall** use calibrated and certified GSE to support integration and testing.
SCSOW922	3.6.0-9	The Contractor **shall** provide Electro Static Discharge (ESD) protection for the spacecraft bus, spacecraft, and satellite.
SCSOW923	3.6.0-10	The Contractor **shall** provide and use bagging for the satellite in addition to the GFP instrument bagging provided by the GFP instrument contractors.
SCSOW924	3.6.0-11	The Contractor **shall** continue to identify and document any discrepancy that may have an impact on orbital operations.
SCSOW925	3.6.0-12	The Contractor **shall** be responsible for testing, monitoring, and complying with ISO 14644-1 Class conformance during all I&T and launch processing facility operations.
SCSOW926	3.6.1	## 3.6.1 Spacecraft I&T
SCSOW927	3.6.1.0-1	The Contractor **shall** completely test all the onboard fault management system, including safing operations, on the spacecraft prior to implementing the formal baseline CPT of the spacecraft.

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SCSOW928	3.6.1.0-2	The Contractor **shall** ensure that following the successful execution of the fault management testing, all non-hazardous safing operations are enabled during subsequent system level tests and CPTs.
SCSOW929	3.6.1.0-3	The Contractor **shall** continue to maintain and implement a system for trending and reporting unit/component, subsystem, and spacecraft level performance during I&T.
SCSOW930	3.6.1.0-4	The Contractor **shall** continue to report performance trending results at the PER, and the Satellite PSRs.
SCSOW933	3.6.2	**3.6.2 Satellite I&T**
SCSOW934	3.6.2.0-1	The Contractor **shall** perform the integration of the GFP instruments onto the spacecraft.
SCSOW935	3.6.2.0-2	The Contractor **shall** organize working groups for each environmental test activity with membership consisting of Contractor, Government, and GFP instrument representatives.
SCSOW1193	3.6.2.0-3	The Contractor **shall** continue to prepare a working group specific Data Package, in a Contractor defined format, and provide that package to the Government no later than 5 business days before the working group.
SCSOW1216	3.6.2.0-4	The Contractor **shall** completely test the onboard fault management system, including safing operations, on the spacecraft prior to integration of the GFP instruments.
SCSOW936	3.6.2.0-5	The Contractor **shall** develop the Safe-To-Mate test procedure for the electrical integration of each GFP instrument to the spacecraft in concert with the GFP instrument contractor and the Government.
SCSOW937	3.6.2.0-6	The Contractor **shall** continue to provide the clean room area, office space, and support to each GFP instrument team to aid in the effort associated with the Bench Acceptance Test of each of the GFP instruments after their arrival at the spacecraft I&T facility.
SCSOW938	3.6.2.0-7	The Contractor **shall** mount, align, and verify that GFP instruments have been integrated to the spacecraft according to the GFP instrument ICD.
SCSOW939	3.6.2.0-8	The Contractor **shall** provide a gas purge to the GFP instrument optical cavities during all storage, test, and transport operations if required by the GFP instrument and as specified in the GFP instrument ICD.
SCSOW940	3.6.2.0-9	The Contractor **shall** continue to document the method and procedure of optical alignment of each GFP instrument during all phases of I&T.
SCSOW1194	3.6.2.0-10	The Contractor **shall** continue to measure the optical alignment of each GFP instrument before and after environmental testing.
SCSOW1195	3.6.2.0-11	The Contractor **shall** continue to support the checkout of instrument operability during all phases of I&T.
SCSOW943	3.6.2.0-12	The Contractor **shall** provide access to each GFP instrument contractor to inspect and clean the GFP instruments as documented in the GFP instrument ICD.
SCSOW944	3.6.2.0-13	The Contractor **shall** ensure that GFP instrument GSE is properly configured (and powered on) prior to any testing of a GFP instrument.
SCSOW945	3.6.2.0-14	The Contractor **shall** allocate and support 30 days dedicated to GFP instrument functional testing prior to the start of environmental testing.
SCSOW1169	3.6.2.0-15	The Contractor **shall** allocate and support 15 days of dedicated GFP instrument test time prior to satellite structural and mechanical verification testing.

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SCSOW946	3.6.2.0-16	The Contractor **shall** allocate and support 30 days dedicated to GFP instrument testing during thermal vacuum.
SCSOW1080	3.6.2.0-17	GFP instrument testing time **shall** not include test set-up, spacecraft preparation, or test teardown.
SCSOW947	3.6.2.0-18	The Contractor **shall** provide the required spacecraft orientation and access per GFP instrument test procedure.
SCSOW948	3.6.2.0-19	Spacecraft testing may be conducted in parallel if the Government determines that it does not interfere with, or compromise GFP instrument testing.
SCSOW1213	3.6.2.0-20	The Contractor **shall** accommodate and support GFP instrument testing in parallel with satellite testing, if the Government determines that it does not interfere or compromise satellite testing.
SCSOW949	3.6.2.0-21	The Contractor **shall** document GFP instrument testing and inspection to be accomplished at the launch site in the ICD.
SCSOW950	3.6.2.0-22	The Contractor **shall** align the GFP instrument alignment reference frame to the spacecraft IRU reference frame.
SCSOW951	3.6.2.0-23	The Contractor **shall** measure the alignment between the GFP instrument alignment reference frame and the spacecraft IRU reference frame specified in the ICD.
SCSOW952	3.6.2.0-24	The Contractor **shall** integrate the GFP instrument units onto the spacecraft and apply any interstitial materials as conductive enhancements. Selection and application of any interstitial materials require the concurrence of the GFP instrument contractor and Contractor.
SCSOW953	3.6.2.0-25	The Contractor **shall** measure dynamic interactions between spacecraft and GFP instrument units.
SCSOW954	3.6.2.0-26	The Contractor **shall** measure the spacecraft magnetic dipole.
SCSOW955	3.6.2.0-27	The Contractor **shall** measure electromagnetic interactions between the spacecraft and GFP instruments with all communications functions and instruments operating in an on-orbit mode.
SCSOW956	3.6.2.0-28	The Contractor **shall** continue to define, analyze, and document the requirements for all environmental tests associated with the spacecraft and GFP instruments.
SCSOW957	3.6.2.0-29	The Contractor **shall** define each test, provide facilities, prepare tests, and operate each environmental test as defined in the Spacecraft F&PS.
SCSOW958	3.6.2.0-30	The Contractor **shall** accommodate GFP instrument requirements for environmental testing by providing testing periods prior to, during, and after each environmental test.
SCSOW1214	3.6.2.0-31	The Contractor **shall** accommodate GFP instrument LPTs between satellite vibration tests of each axis.
SCSOW959	3.6.2.0-32	The Contractor **shall** conduct test data reviews within 5 business days with the Government after each major test event.
SCSOW960	3.6.2.0-33	The Contractor **shall** provide all purge gases for use by the GFP instruments as documented in each GFP instrument ICD.
SCSOW961	3.6.2.1	**3.6.2.1 Special Testing**
SCSOW963	3.6.2.1.0-1	The Contractor **shall** provide wideband data generated and recorded during pre-thermal vacuum testing, and thermal vacuum testing, for all radiometric instruments without use of any simulators.
SCSOW964	3.6.2.1.0-2	The Contractor **shall** perform a Satellite Dynamic Interaction Test.

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SCSOW965	3.6.2.1.0-3	The Contractor **shall** perform a Modal Survey Test if there are changes in the instrument complement or the spacecraft.
SCSOW966	3.6.2.1.0-4	The Contractor **shall** perform a RF Airlink Test.
SCSOW967	3.6.2.1.0-5	The Contractor **shall** perform a RF Compatibility Test for the Auxiliary Communications
SCSOW968	3.6.2.1.0-6	The Government will provide use of the CTV.
SCSOW971	3.6.2.2	**3.6.2.2 ETE Testing**
SCSOW972	3.6.2.2.0-1	The GOES-R Program will define a series of satellite-to-ground system ETE tests. The ETE testing will focus on the validation and compatibility of flight and ground hardware, software, and communications interfaces in a mission operations context.
SCSOW973	3.6.2.2.0-2	The Government MOST will manage the execution of the ETE testing.
SCSOW974	3.6.2.2.0-3	The Contractor **shall** provide all resources for and execute five (5) ETE tests for a total duration of 14 days (336 hours).
SCSOW975	3.6.2.2.0-4	The Contractor **shall** continue to support the development, modification, and review of ETE test plans and procedures as part of the joint mission operations, spacecraft, GFP instrument, and ground segment teams.
SCSOW1196	3.6.2.2.0-5	The Contractor **shall** provide simulation and stimulation sources for ETE tests when emulation of the flight environment is not feasible as determined by the Government.
SCSOW1197	3.6.2.2.0-6	The Contractor **shall** obtain approval from the Government before using any simulator in an ETE test configuration.
SCSOW976	3.6.3	**3.6.3 Transportation and Handling**
SCSOW977	3.6.3.0-1	The Contractor **shall** transport the satellite, all spacecraft GSE, all GFP instruments' GSE, and all other required items to and from all test facilities, and to the launch site, safely and in a manner compatible with all applicable environmental specifications and licensing requirements.
SCSOW978	3.6.3.0-2	The Contractor **shall** perform final satellite preparations and checkout at the launch site.
SCSOW979	3.6.3.0-3	The Contractor **shall** provide satellite GSE for integration and testing at the launch processing facility.
SCSOW981	3.6.3.0-4	The Contractor **shall** provide the transportation and handling back to the Contractor's I&T facility of all equipment shipped to the launch site remaining after the launch.
SCSOW1200	3.6.3.0-5	The Contractor **shall** design, analyze, and validate all changes to shipping containers that result from modifications to the subsystems, spacecraft, and satellite.
SCSOW982	3.6.3.0-6	The Contractor **shall** provide all shipping containers for the subsytems, spacecraft, and satellite.
SCSOW984	3.6.4	**3.6.4 Storage**
SCSOW985	3.6.4.0-1	The Contractor **shall** store the satellite and associated GSE for up to five (5) years.
SCSOW986	3.6.4.0-2	The Contractor **shall** provide sustaining engineering during the storage of the satellite.
SCSOW987	3.6.4.0-3	The Contractor **shall** provide testing and refurbishment during storage of the satellite.
SCSOW988	3.6.4.0-4	The Contractor **shall** perform an LPT annually while the satellite is in storage.

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SCSOW989	3.6.4.0-5	The Contractor **shall** perform a thermal vacuum test on the satellite if the satellite has been in storage for more than four (4) years.
SCSOW990	3.6.4.0-6	The Contractor **shall** perform a CPT after final removal of the satellite from storage.
SCSOW1081	3.6.4.0-7	The Contractor **shall** bag the spacecraft bus, spacecraft, and satellite during periods when no work is being performed on the hardware for three (3) days or greater.
SCSOW991	3.7	**3.7 Launch and Operations**
SCSOW996	3.7.0-1	The Contractor **shall** continue to provide all resources to analyze, plan, perform, coordinate, and document all phases of launch operations for the satellite from arrival at the range through launch, including satellite servicing in the event of mission abort.
SCSOW1007	3.7.1	**3.7.1 Satellite / Launch Vehicle I&T**
SCSOW1009	3.7.1.0-1	The Contractor **shall** provide support to the Government for the development of GFP LV contract launch base requirements documents, which include but are not limited to the PRD, LSSP, satellite test plans and procedures, and Launch Base PPRD.
SCSOW1008	3.7.1.0-2	The Contractor **shall** continue to provide support for all activities associated with satellite to launch vehicle integration. This includes, but is not limited to: interface verification, integrated Satellite/Launch Vehicle test plan and procedure development, satellite to launch vehicle integration operations, ground processing facilities and GSE integration/readiness, and launch support efforts.
SCSOW1201	3.7.1.0-3	The Contractor **shall** allocate and support 15 days of dedicated GFP instrument test during satellite/launch vehicle I&T.
SCSOW992	3.7.1.0-4	The Contractor **shall** continue to perform CPTs at the launch processing facility as defined in the Satellite Integration & Test Plan.
SCSOW994	3.7.1.0-5	The Contractor **shall** continue to perform LPTs after mating to the launch vehicle as defined in the Satellite Integration & Test Plan.
SCSOW993	3.7.1.0-6	The Contractor **shall** provide personnel, fueling GSE, and perform satellite fueling.
SCSOW1170	3.7.2	**3.7.2 Flight Operations**
SCSOW995	3.7.2.0-1	The Contractor **shall** continue to provide flight operations support for the satellite from launch through L+180 days or the completion of orbital activation and performance verification, whichever is longer.
SCSOW997	3.7.2.0-2	The Contractor **shall** continue to maintain the FOO responsible for the management activities associated with the satellite flight operations.
SCSOW1104	3.7.2.0-3	The Contractor **shall** continue to support MOST activities, which will be led by a Government MOM.
SCSOW1223	3.7.2.0-4	The Contractor **shall** support six (6) simulations to be conducted by the MOST at the NOAA Satellite Operations Facility (NSOF).
SCSOW998	3.7.2.0-5	The FOO **shall** continue to be responsible for coordinating information exchange between the satellite development activities and the MOST.
SCSOW999	3.7.2.0-6	The FOO **shall** continue to be responsible for planning, reporting, development of operations review presentations, oversight of flight operations activities, and providing technical operations support for technical reviews.

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SCSOW1000	3.7.2.0-7	The Contractor **shall** provide flight operations support at the NOAA SOCC from LRD-12 months until acceptance of the satellite by the Government.
SCSOW1002	3.7.2.0-8	The Contractor **shall** continue to provide reference materials and support in the development or modification of flight operations and ground procedures, satellite and ground system testing, and performance verification of all products and deliverables for launch, satellite performance verification, storage, and nominal and contingency operations.
SCSOW1003	3.7.2.0-9	The Contractor **shall** ensure the launch and early orbit activation / performance verification engineering team are present at the NOAA SOCC for all launch and mission rehearsals in order to receive training and certification for launch operations.
SCSOW1004	3.7.2.0-10	The Contractor **shall** provide operations support 24 hours per day, 7 days per week until the satellite has completed all deployments and all maneuvers to reach its test orbital location.
SCSOW1005	3.7.2.0-11	The Contractor **shall** continue to support the MOST, which is operating the satellite from the NOAA SOCC consoles through satellite performance verification.
SCSOW1006	3.7.2.0-12	The Contractor **shall** use the existing GIR system for reporting pre- and post-launch incidents and discrepancies for the flight segment. The GIR system will be utilized by both the flight and ground segments for the GOES-R series.
SCSOW1010	3.7.3	**3.7.3 Operations Training**
SCSOW1011	3.7.3.0-1	The Contractor **shall** provide two (2) three-day training sessions covering all updates to the operation of the satellite, including software.
SCSOW1012	3.7.3.0-2	The Contractor **shall** provide updated training materials for the operations of the spacecraft, GFP instruments, and the satellite simulator.
SCSOW1013	3.7.3.0-3	The Contractor **shall** record and provide a DVD of each type of training session.
SCSOW1014	3.7.3.0-4	The Contractor **shall** perform a minimum of three (3) Launch Countdown rehearsals, during launch site processing, which include the introduction of simulated anomalies, launch countdown abort, hold, and recycle events.
SCSOW1015	3.7.4	**3.7.4 Simulator Maintenance**
SCSOW1016	3.7.4.0-1	The Contractor **shall** continue to operate and maintain a satellite simulator at the NOAA SOCC until the completion of orbital checkout of the satellite.
SCSOW1017	3.7.4.0-2	The Contractor **shall** maintain and repair any simulator within 24-hours of being reported for the deliverable simulator(s) from LRD-5 months to L+180 days or the completion of orbital activation and checkout, whichever is longer.
SCSOW1202	3.7.4.0-3	The Contractor **shall** continue to repair any simulator within 72-hours of being reported for the delivered simulators from the completion of orbital checkout through the duration of the mission life (deactivation of the GOES-R series).
SCSOW1203	3.7.4.0-4	The Contractor **shall** continue to provide all maintenance for the delivered simulators from the completion of orbital checkout through the duration of the mission life (deactivation of the GOES-R series.
SCSOW1018	3.8	**3.8 Post Acceptance Support**
SCSOW1019	3.8.0-1	The Contractor **shall** provide sustaining engineering for the fifteen (15) years of the satellite life.

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SCSOW1020	3.8.0-2	Sustaining Engineering **shall** include, but is not limited to advising the Government on a continual basis, satellite and instrument trend and performance analyses, and satellite operations support during satellite anomaly investigation and resolution or contingency operations.
SCSOW1021	3.8.0-3	The Contractor **shall** investigate, resolve, and implement corrective action for satellite anomalies.
SCSOW1022	3.8.0-4	The Contractor **shall** provide support for decommissioning the satellite.
SCSOW1023	3.9	**3.9 Special Studies & Tasks**
SCSOW1024	3.9.0-1	The Contractor **shall** continue to perform special studies and tasks as directed by the Government.
SCSOW1025	3.9.0-2	The studies and tasks will be requested on a task order basis as directed by the Contracting Officer.
SCSOW1026	3.10	**3.10 Education and Public Outreach**
SCSOW1027	3.10.0-1	The Contractor **shall** continue to furnish all resources necessary to develop and implement an education and public outreach program for the GOES-R series, including but not limited to posters, K-12 student teacher programs, and training aides.

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SCSOW1028	4	**4 Option 1 Spacecraft #3**
SCSOW1029	4.0-1	The Contractor **shall** develop and deliver a spacecraft bus, spacecraft, and satellite designated as GOES-T.
SCSOW1030	4.0-2	The effort **shall** include design, analyses, validation, fabrication, assembly, test, verification, maintenance, storage, delivery, and post-acceptance support through the life of the mission.
SCSOW1031	4.0-3	For GOES-T, the Contractor **shall** perform all work as set forth in Section 3 of this SOW.
SCSOW1165	4.0-4	The GOES-T satellite **shall** accommodate the instruments on the GOES-R satellite in addition to an advanced instrument.
SCSOW1207	4.0-5	Upon exercising Option #1 of the basic contract, the Contractor **shall** move the organization, tracking, and reporting of parts and material for GOES-T from WBS Element 5.0 to WBS Element 3.0.

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SCSOW1032	5	**5 Option 2 Spacecraft #4**
SCSOW1033	5.0-1	The Contractor **shall** develop and deliver a spacecraft bus, spacecraft, and satellite designated as GOES-U.
SCSOW1034	5.0-2	The effort **shall** include design, analyses, validation, fabrication, assembly, test, verification, maintenance, storage, delivery, and post-acceptance support through the life of the mission.
SCSOW1035	5.0-3	For GOES-U, the Contractor **shall** perform all work as set forth in Section 3 of this SOW.
SCSOW1166	5.0-4	The GOES-U spacecraft **shall** accommodate the instruments on the GOES-R satellite in addition to an advanced instrument.
SCSOW1208	5.0-5	Upon exercising Option #2 of the basic contract, the Contractor **shall** move the organization, tracking, and reporting of parts and material for GOES-U from WBS Element 5.0 to WBS Element 4.0.

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SCSOW1036	6	# 6 Spares
SCSOW1037	6.1	## 6.1 Spare Parts and Material
SCSOW1038	6.1.0-1	The Contractor **shall** procure, fabricate, assemble, and test spare parts and material including wire and connectors to support the two spacecraft under the basic contract.
SCSOW1205	6.1.0-2	Upon receiving written approval from the Government, the Contractor **shall** procure, fabricate, assemble, and test all parts and materials including wire and connectors required for the development and delivery of the two additional optional spacecraft.
SCSOW1206	6.1.0-3	The Contractor **shall** procure, fabricate, assemble, and test spare parts and material including wire and connectors to support the optional spacecraft, when exercised.
SCSOW1124	6.1.0-4	The Contractor **shall** organize, track, and report spare parts and material for each spacecraft in separate WBS subelements.
SCSOW1039	6.2	## 6.2 Spare Assemblies/Subassemblies
SCSOW1040	6.2.0-1	The Contractor **shall** fabricate, assemble, and test spares for all mechanisms, gimbals, and deployment hardware.
SCSOW1041	6.2.0-2	The Contractor **shall** fabricate, assemble, and test spares for all heat pipes, radiators, and heaters.
SCSOW1042	6.2.0-3	The Contractor **shall** fabricate, assemble, and test spares for all attitude control sensors and actuators.
SCSOW1043	6.2.0-4	The Contractor **shall** fabricate, assemble, and test spares for all electronic cards.
SCSOW1044	6.2.0-5	The Contractor **shall** fabricate, assemble, and test spares for all transmitters, transponders amplifiers, antennas, and switching hardware.
SCSOW1046	6.2.0-6	The Contractor **shall** fabricate, assemble, and test spares for all critical propulsion components.
SCSOW1047	6.2.0-7	The Contractor **shall** fabricate, assemble, and test a spare Magnetometer.