



# GOES-R MANAGEMENT CONTROL PLAN (MCP)

VERSION 1  
December 4, 2007



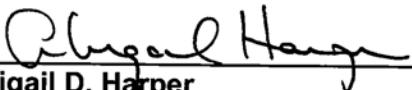
U.S. Department of Commerce (DOC)  
National Oceanic and Atmospheric Administration (NOAA)  
National Environmental Satellite, Data, and Information Services (NESDIS)

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**Geostationary Operational Environmental Satellite – R Series (GOES-R)  
Management Control Plan (MCP)**

**Submitted by:**

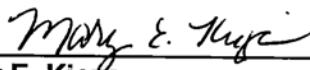
  
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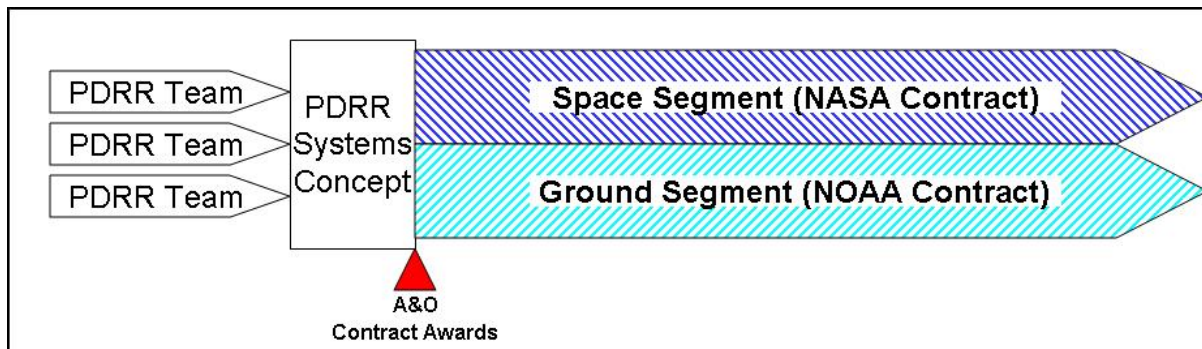
# 1 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA) operates a system of environmental satellites in geostationary orbits to provide continuous weather imagery and monitoring of meteorological data for the United States, Latin America, much of Canada and most of the Atlantic and Pacific ocean basins. Geostationary Operational Environmental Satellites (GOES) provide critical atmospheric, oceanic, climatic, and solar products supporting weather forecasting and warnings, climatologic analysis and prediction, ecosystems management, and safe and efficient public and private transportation. The GOES satellites also provide a platform for space environmental observations, and auxiliary communications services that provide for GOES data rebroadcast, data collection platform relay, low resolution imagery, emergency weather communications, and satellite aided search and rescue.

GOES-R is a collaborative development and acquisition effort between NOAA and the National Aeronautics and Space Administration (NASA). Program activities occur at the co-located Program and Project Offices at Goddard Space Flight Center (GSFC), Greenbelt, MD.

The GOES-R program acquisition and management strategy was restructured at the end of the Program Definition and Risk Reduction (PDRR) Phase from a single-system prime NOAA contract acquisition to an inter-agency dual-contract acquisition for the Acquisition and Operations (A&O) Phase of the Program. Under a dual-contract acquisition strategy, the National Aeronautics and Space Administration (NASA) will procure the Space Segment and NOAA will procure the Ground Segment. The overall System Engineering and Integration will be performed by the GOES-R Program Office. As a result of the change to the acquisition and management strategy, NOAA and NASA have agreed to tailor procedures to apply to the GOES-R program in order to meet the unique demands of this joint inter-agency acquisition. These needs include safeguarding NOAA's oversight of the entire GOES-R program, including the Flight Project (e.g., Space Segment) and the Ground Segment Project (Ground Segment) and also safeguarding NASA's effective exercise of its expertise over the Flight Project.

Figure 1 below graphically depicts the acquisition and management strategy for the A&O Phase of the GOES-R Program.



**Figure 1: GOES-R Acquisition Strategy for A&O Phase**

DOC provides policy oversight and guidance to NOAA for successful procurement and operation of the GOES-R system. In order for the Department to exercise meaningful oversight over the processes utilized for the effective management of the GOES-R Program, which includes both Projects and the Systems Engineering and Integration (SE&I) function, the Department may institute reviews, require reports, and exercise any other oversight mechanism to provide the Department with adequate information to determine whether the GOES-R Program meets the cost, schedule and technical baselines. Nothing in this MCP should be construed to limit the inherent right of the Department to conduct effective oversight of the GOES-R Program.

Disagreements that can not be resolved by the GOES-R SPD shall be documented in writing and elevated to the NESDIS Assistant Administrator (AA) and the GSFC Center Director for resolution. Failing resolution at that level, the issue shall be elevated to the signatory positions of the MOU and successively higher positions as necessary for final resolution.

## 2 PURPOSE OF DOCUMENT

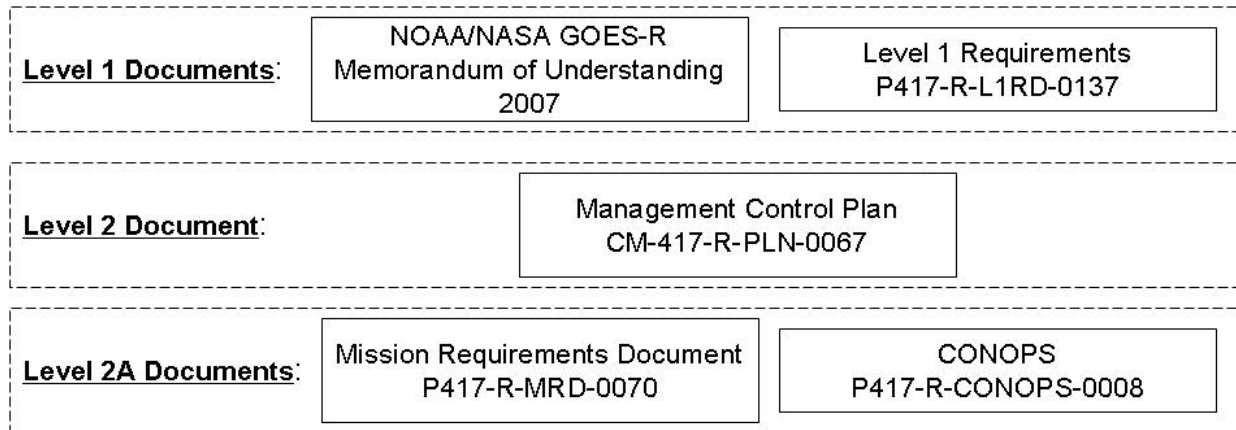
This Management Control Plan (MCP) is authorized by the Memorandum of Understanding between NOAA and NASA dated June 15, 2007 and documents the business processes, management controls, and organizational structure of the GOES-R program. The MCP is derived from NASA Procedural Requirement (NPR) 7120.5D and outlines the specific implementation of 7120.5D as it applies to the GOES R program and projects. The MCP forms the basis for the Projects Plans of the Flight and Ground Segment Projects.

The contents of the GOES-R MCP satisfy the requirements of DAO 208-3, “Major System Acquisitions for the Department of Commerce,” which requires major systems to document a program management and control structure that describes the Program’s business processes.

The MCP is meant to be a management tool, with conflicts resolved at the lowest practical level. The System Program Director retains the authority to resolve all internal disputes within the GOES-R program.

### 2.1 Relationship to Other Documents

Figure 3 depicts the relationship of the GOES-R MCP to other GOES-R documents.



**Figure 2: Management Control Plan relationship to Other Program Documents**

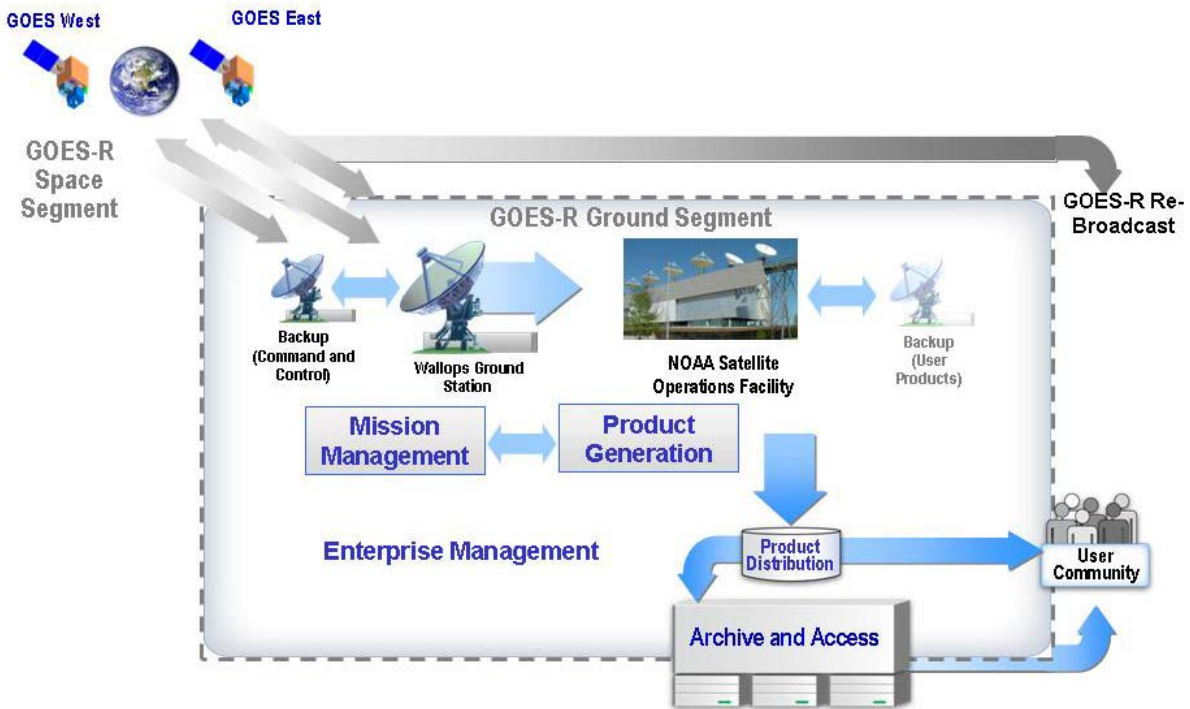
The hierarchical description of documents in Figure 2 is effective for purposes of resolving any conflicts between any of the documents listed in Figure 2. Thus, the Memorandum of Understanding between NOAA and NASA dated June 15, 2007 supersedes any conflicting provisions of this MCP. Section 5 of the MOU identifies this MCP as the implementation for the MOU and NPR-7120.5D. Any conflict between the provisions of the Memorandum of Understanding and this MCP will be resolved by the NESDIS AA and GSFC Director by consulting the letter and intent of the Memorandum of Understanding. The GOES-R System Program Director resolves conflicts between GOES-R Level 2 and 2A documents.



### 3 PROGRAM IMPLEMENTATION

#### 3.1 Technical Architecture

The end-to-end (ETE) GOES-R system includes spacecraft, instruments, launch services, and all associated ground system elements and operations. Figure 3 below illustrates the functional GOES-R End-to-End System.



**Figure 3: Baseline GOES-R series System Configuration**

The GOES-R operational lifetime extends through December 2027.

Figure 4 provides the locations of the GOES-R fleet. Two operational satellites positioned at 137 degrees West longitude for the Western Operational station, and at 75 degrees West longitude for the Eastern Operational station. During the on-orbit storage period, the satellites will be positioned at 105 degrees West longitude and a Launch/Check-out position is reserved at 90 degrees West longitude.



**Figure 4: Technical Architecture**

### 3.1.1 Space Architecture

The GOES-R space architecture will accomplish the following:

- Maintain continuous service from a GOES system that meets the remote sensing requirements as specified by NOAA; that is, to provide for continuous observations of the Earth, its atmosphere, and the solar and space environment, from a geosynchronous orbit.
- Provide for reception and relay of data from ground based Data Collection Platforms (DCP) to the NOAA prime and backup Command and Data Acquisition (CDA) ground stations.
- Provide for continuous relay of weather facsimile (WEFAX) and other data to small users, independent of all other functions.
- Permit relay of distress signals from aircraft or marine vessels to the Search and Rescue ground stations of the Search and Rescue Satellite Aided Tracking (SARSAT).
- Provide a spacecraft capability for permitting data transmission via the Emergency Manager's Weather Information Network (EMWIN).
- Provide satellite platforms suitable for supporting the instrument payloads.

The Flight Project will implement the space architecture by issuing separate contracts for the development of the instruments and the spacecraft. The Flight Project includes the instruments, spacecraft, launch services, satellite integration, and on-orbit satellite initialization and checkout. The Flight Project will provide launch services and instruments as government furnished equipment (GFE) to the spacecraft contractor. After launch, the spacecraft contractor will support the NOAA Satellite Operations Control Center (SOCC) until the spacecraft checkout is completed and the spacecraft is turned over to NOAA for operations.

The Advanced Baseline Imager (ABI) will provide key performance parameters hemispheric, synoptic, and mesoscale imagery for global and Continental United States (CONUS) forecasting and severe weather warning. Additional instruments include Space Environment In-Situ Suite (SEISS), Extreme Ultraviolet Sensor/X-Ray Sensor Irradiance Sensors (EXIS), Solar Ultraviolet Imager (SUVI), Geostationary Lightning Mapper (GLM), and Magnetometer (MAG). The instruments will be provided to the Space Segment A&O contractor as Government Furnished Equipment (GFE) for integration into the spacecraft.

### **3.1.2 Ground Architecture**

The Ground Segment encompasses the following four major functions: 1) Mission Management (MM), 2) Enterprise Management (EM), 3) Product Generation (PG), and 4) Product Distribution (PD). These functions comprise the core Ground Segment functional architecture.

Mission Management (MM) includes mission scheduling, satellite (including instrument) operations, satellite state-of-health trending, orbital analysis, and ground operations.

Enterprise Management (EM) supports all operational functions by monitoring, assessing, and controlling the configuration of the operational systems, networks, and communications for the GOES-R ground segment. EM serves as the “glue” that links the MM, PG, and PD elements and provides for a degree of automated control. EM thus contributes to greater operational availability, efficiency, and safety of the GOES-R system.

Product Generation (PG) includes algorithm support, processed raw data, processing to Level Ib (including calibration, navigation and registration), generation of the data for rebroadcast and for higher level data creation including operational derived products. The government will provide the necessary science algorithms for the generation of user products.

Product Distribution (PD) includes distribution of Level Ib, Level II+, and derived products to user portals while addressing interfaces with the user for accessing GOES data. The primary user portals include the GOES-R satellite series (e.g., for uplink of Global Re-Broadcast (GRB)) NOAA’s National Weather Service (NWS).

### **3.1.3 End to End Architecture Validation**

The GOES R Program will have an ETE test program which focuses on the validation and compatibility of flight and ground hardware, software, and communications interfaces in a mission operations context. The ETE test program is intended to supplement the project level Verification and Validation (V&V) programs using operational configurations and procedures. The details of the ETE test program are described in the GOES R Test & Evaluation Management Plan (P417-R-PLN-0083).

## **3.2 Organizational Structure and Interdependencies**

This section describes the relationship of the GOES-R Program and Projects to one another and to other organizations within NOAA, the National Environmental Satellite Data Information Service (NESDIS), and NASA.

### **3.2.1 Relationships**

Figure 5 summarizes the organizational structure and interdependencies between NOAA, NESDIS, NASA and the GOES-R Program.

Function	Organization					
	NOAA US/DUS	NESDIS AA/DAA	NESDIS Operational & Data Ctr	NASA	System Program Director	Project Managers
<b>Concept studies</b>	-Serve as selection official for PDRR selections	-Develop direction & guidance for concept studies		-Provide technical management of concept studies (GSFC)	- Perform architecture studies - Develop and execute study contracts - Provide contract management for concept studies	-Support and conduct concept studies consistent with direction and guidance from program / NESDIS
<b>Development of Program and Project Level Requirements</b>	-Approve GOES-R system Level I requirements	- Execute Level I requirements - Approve Level II requirements			- Execute level 2 and 2a requirements - Allocate requirements to projects - Approve level IIa and III	- Execute Level III requirements - Approve level IIIa requirements
<b>Resource management (Program Budget)</b>	- Develop & execute NOAA budget - Conduct annual budget submission reviews - Approve individual program budgets	- Establish GOES-R budget - Execute budgets for GOES-R supporting infrastructure	-Establish budget for necessary support functions  -Implement support functions consistent with budget	GSFC: -Approve annual submission of NASA project budgets -Provide resources for management of NOAA resources applied to NASA -Approve cost estimates for NASA functions	-Develop GOES-R program budget for fiscal year and life cycle -Implement program consistent with budget -Provide annual budget submission input manage program resources - Coordinate development of cost estimates for support functions	- Provide project budget requirements to GOES-R Program Office (GPO) - Execute project budget
<b>Inter-government Agreements</b>	-Sign agreement for NOAA	-Support execution of agreement		Sign for NASA (NASA HQ)	-Manage program IAW agreement	Support SPD
<b>Staffing Mgt</b>		-Establish NESDIS civil servant staffing	-Develop staffing plan necessary for support functions	-Provide staff in accordance with annual staffing plan (GSFC)	-Develop program staffing plans - implement staff plans	-Develop project staffing plans -implement staffing plans
<b>Project Plans</b>					-Approve as needed	-Develop and execute

Function	Organizations					
	NOAA US/DUS	NESDIS AA/DAA	NESDIS Operational & Data Ctr	NASA	System Program Director	Project Managers
<b>Program / Project Performance Assessment</b>	-Chair NOAA PMC	--Award fee determination for ground contracts - Review program/project performance via - Management interaction -Special issue topic resolution - Monthly reporting requirements - Receives briefing from NASA Award Fee Determination Official on decision and rationale for Flight Project Award fees		-Award fee determination for flight contracts (GSFC Code 400) - Review Program and Projects (GSFC CMC)	-Chair Performance Evaluation Board (PEB) for all spacecraft and major ground contracts - Concur with Award Fee Plan	-Chair PEBs as delegated by SPD
<b>Launch Commit</b>	-Approve mission readiness	-Approve flight and launch readiness		GSFC: -Concur with launch readiness -launch commit	-Provide launch readiness statement	-Develop launch readiness criteria
<b>Independent Reviews</b>	- Approve IRT membership - Receive reports from IRT & SRB - Determines SRB scope & chairmanship	- Approve SRB membership & SRP - Approve System Review Plan -Receive reports from IRT and SRB		- NASA AA: Determines SRB scope & chairmanship - GSFC CMC: Manage SRB infrastructure - GSFC Deputy Ctr Dir: Approve SRB membership & SRP	- Support IRTs - Review and respond to SRB results	-Support SRBs
<b>Acquisition</b>	- Serve as selecting Official for NOAA Contracts	-Review IT acquisition requests		-Serve as Selecting Official for NASA Contracts (GSFC) Act as selecting office for instrument procurements (Code 400)	-Provide support and oversight of source selection process	- Manage and execute contracts - Execute Source Selection process
<b>Schedule Baseline Control (Section 5.2.2.2.2)</b>	Key Milestone concurrence	Critical Milestone Approval		Key Milestone Readiness - Critical milestone concurrence for flight (GSFC)	-Critical milestone readiness -Program milestone approval	-Project milestone approval -Program milestone readiness
<b>Decision Authority for Reviews</b>	- Program Gateway Review Approval - approves readiness for KDP-I - approval authority for KDP-II	Project Entrance Review Approval				
<b>Certification and Accreditation Organization</b>		- Perform C&A related authorizing official activities -Designate a certification agent			- Perform C&A-related system owner activities. - Appoints a GOES-R Information System Security Officer (ISSO)	

**Figure 5: Organizational Interdependencies Summary**

### **3.2.1.1 National Oceanic and Atmospheric Administration (NOAA) Organizations**

NOAA is accountable to DOC for successful GOES-R development and operational mission success. NOAA provides direct oversight for the GOES-R Program, Flight and Ground Segment Project through the NOAA Program Management Council (PMC).

The GOES-R System Program Director (SPD) reports to the Deputy Assistant Administrator (Systems) (DAAS) in the NOAA Office of Satellite and Information Services (NESDIS).

The Flight Project Manager (a NASA employee) and the Ground Segment Project Manager (a NOAA employee) report to the GOES-R SPD, a NOAA employee.

### **3.2.1.2 National Environmental Satellite, Data, and Information Services (NESDIS)**

The NESDIS Assistant Administrator (AA) retains authority to conduct program reviews and coordinate with NOAA.

NESDIS will provide technical authority resources for the ground segment.

Office of the Chief Information Officer (OCIO) performs certification and accreditation related Authorizing Official Designated Representative (AODR) responsibilities, appoints a Certification Agent, and oversees SPD compliance with IT security requirements.

### **3.2.1.3 NASA Headquarters**

As agreed in the MOU, the Administrator of NASA will meet at least annually and on an as needed basis with the NOAA Administrator to discuss program progress and status.

NASA Science Mission Directorate (SMD) will have representation on the GSFC CMC for monthly status and gateway readiness reviews. NOAA will also extend an invitation for NASA SMD to participate as a voting member for Flight Project and ad-hoc member for Ground Segment and Program at NOAA PMC Gateway and Gateway Readiness Reviews.

### **3.2.1.4 NASA GSFC Organizations**

NASA Goddard Space Flight Center (GSFC) is responsible for procurement, management, and execution of the Flight Project in accordance with overall NOAA guidance, standard technical oversight resources for program and projects, staffing of senior leadership positions outlined in the MOU.

Standard NASA technical oversight resources are defined as the Mission Assurance function, Technical Authority as defined in paragraph 4.3, Standing Review Board (SRB) management, and other exercise of NASA technical expertise through the NOAA PMC. NASA GSFC will co-manage the SRB together with NOAA.

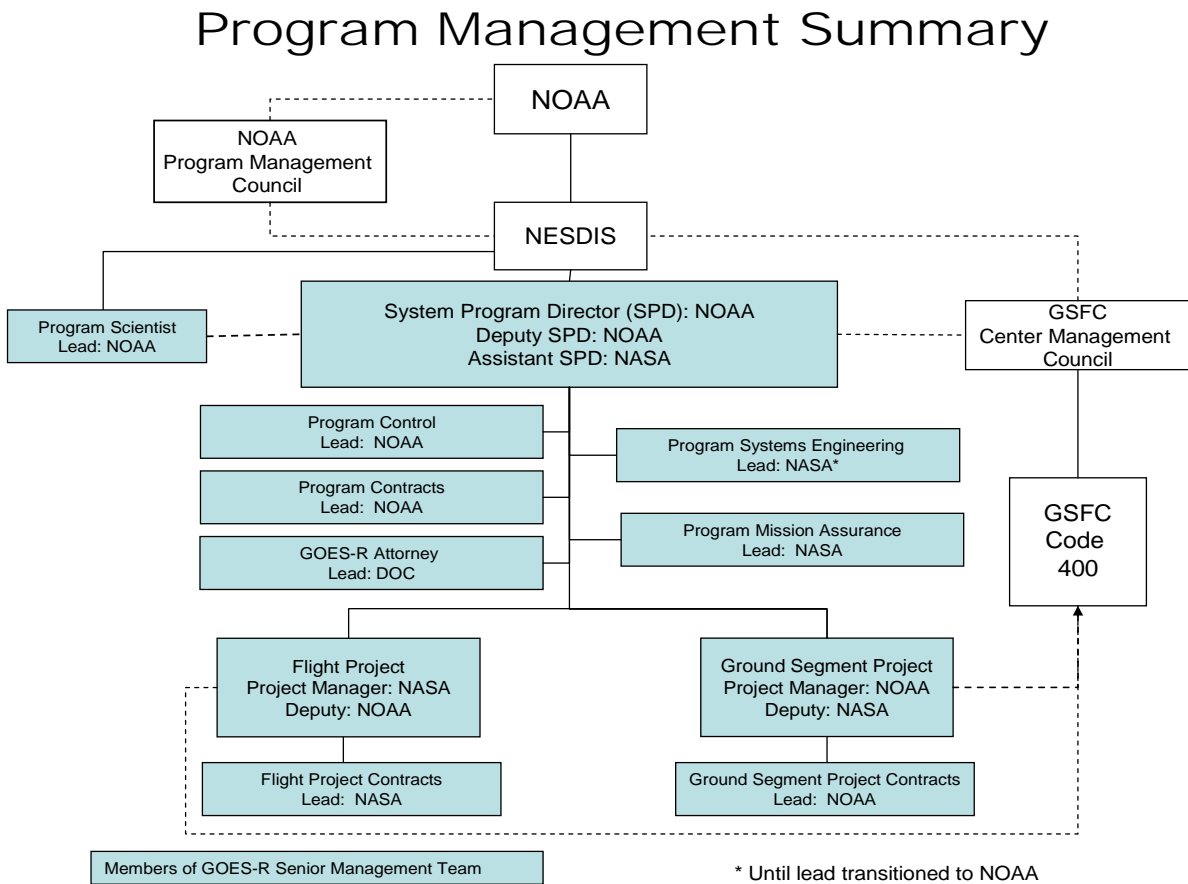
The GOES-R SPD and senior GSFC managers will coordinate the assignments of individuals to key program and project office contract management positions.

The GSFC Center Management Council (CMC) oversees in accordance with overall NOAA guidance the activities, products, and performance of the GOES-R program.

In the event of any defense, litigation or settlement of any claim or protest brought pursuant to any GOES-R procurement, the GSFC legal counsel will fully inform and seek concurrence from DOC GOES-R legal counsel of any actions that it proposes to take.

### 3.2.1.5 GOES-R Program Office

Figure 6 provides a graphic illustration of the GOES-R Organization. The GOES-R program is NOAA led, with an integrated NOAA-NASA program office organization, staffed with personnel from NOAA and NASA, and co-located at NASA/GSFC to maximize program/project office efficiency. Unless otherwise directed by the System Program Director (SPD), the Program Office staff has unfettered access to all project activities.



**Figure 6: GOES-R Organizational Structure**

The GOES-R Program Senior Management Team (SMT) consists of the System Program Director, (SPD), the Deputy System Program Director, (DSPD), Assistant System Program Director, the Program Scientist, the Program Control Lead (Budget Officer), Program Systems Engineering Lead, Mission Assurance, Program Legal Counsel, Flight and Ground Segment Project managers and the Program Contract Lead, Flight and Ground Segment Projects Contracting Officers. The SMT is responsible for program leadership and the integrated functional management of operational, research, development, administrative and programmatic activities. The SMT is the senior advisory board to the System Program Director for decision making and issue resolution.

#### 3.2.1.5.1 GOES-R System Program Director (SPD)

Notwithstanding other duties set forth in the MCP, the SPD (a NOAA employee) has ultimate authority and responsibility for managing the overall performance and operation of the GOES-R program. The SPD reports to the NESDIS Deputy AAS. The SPD is accountable to NOAA / NESDIS management for all aspects of the GOES-R program, including financial, technical, information security, programmatic, and operational performance. The SPD sets the direction of the organization, articulates the vision, develops the goals, sets the programmatic and budget priorities, and guides internal policies and processes. The SPD is responsible for all program status reporting to oversight activities and has sole authority within the program office to propose changes to policies and procedures as they apply to GOES-R. The SPD prepares, defends and executes the GOES-R budget, represents GOES-R to external organizations and is the focal point and principal interface with internal NOAA/NESDIS components, Congress, oversight agencies, and Mission Partners. A summary of the SPD roles and responsibilities is provided below.

- Oversees the success of the GOES-R mission and implementation of the program and has ultimate functional authority over the program and projects
- Leads the development of and approve acquisition strategies, approaches, and RFP documentation for the system PDRR and A&O Phase contracts per the FAR, and NOAA acquisition rules and regulations
- Selects and evaluates the Deputy System Program Director, Ground Segment Project Manager, and Budget Officer (Program Control Lead)
- Approves selection and provides performance inputs for Flight Project Manager, Assistant System Program Director, Program Systems Engineer and Program Mission Assurance Manager in accordance with NASA policy
- Provides selection and performance inputs for program and project personnel
- Prepares, defends and executes the GOES-R budget in accordance with NOAA Planning, Programming, Budgeting, Execution System (PPBES) process.
- Utilizes Program Operating Plans (POP) developed for funding NASA personnel and facilities and NASA contracted efforts as part of the overall NOAA budgeting process
- Designates teams and approve process for evaluations for the GOES-R contracts
- Chairs the Performance Evaluation Boards (PEBs) for the spacecraft and major ground contracts, and will make recommendations to both the NASA and NOAA Fee Determination Officials (FDOs)
- Attends all pre-briefs and source selection evaluation meetings for the GOES-R NASA contracts and will give comments, questions and concerns to the NASA Source Selection Authority (SSA)
- Maintains integrated program schedule to include determination and monitoring of critical path functions in coordination with Program Systems Engineering, Project Managers and team leads
- Performs all certification and accreditation related System Owner activities as identified in DOC, NOAA, NESDIS, and National Institute of Standards and Technology (NIST) IT Security policies and guidance, respectively
- Chairs all program level boards
- Provides functional oversight and direction to Senior Management Team members
- Assures compliance with DOC, NOAA, and NIST Special Publication 800 Series of guidance.

### **3.2.1.5.2 Deputy System Program Director (DSPD)**

The DSPD, a NOAA employee, is responsible for the day-to-day operations of the Program, assuming any responsibilities delegated by the SPD. The DSPD has responsibility for managing the integration and execution of program activities and resources across GOES-R at the discretion of the SPD. In the absence of the SPD, the DSPD assumes full decision-making authority for all program functions and activities.

A summary of the DSPD roles and responsibilities is provided below.



- Provides technical oversight and input to Program Control for GOES-R responses to external and internal NOAA information requests, technical issues (i.e., system anomalies) and Congressional inquiries. This includes coordination of technical responses with cognizant GOES-R division/project personnel
- Provides technical oversight and input to Program Control for the development of all program-level briefings prepared for NOAA/NESDIS senior management and customers
- Supports the preparation of decision packages and progress reports for KDP briefings
- Promotes continuous improvement by identifying deficiencies and redundancies in GOES-R internal and external processes, facilitating agreement and acceptance of approved corrective action, communicating procedural changes, and monitoring the effectiveness of the implementation
- Serves as a Member and Alternate Chair of all Program Boards (Management, Configuration Control, Risk)

### **3.2.1.5.3 Assistant System Program Director (ASPD)**

The Assistant System Program Director (ASPD) is a senior NASA employee who reports to the SPD. The ASPD serves as the SPD and DSPD's bridge to NASA organizations, provides a NASA voice for GOES-R issues which have impacts to NASA, and provides insight on NASA decisions which impact GOES-R. The SPD and DSPD may utilize the ASPD's expertise to assist in any of their specific responsibilities and delegate responsibility as required. ASPD specific responsibilities include, but are not limited to:

- Attend and provide feedback from NASA Goddard Space Flight Center (GSFC) oversight councils to include: Monthly Status Reviews (MSRs), Preliminary MSRs, Quarterly Status Reviews (QSR) and ensure compliance with applicable NASA documentation and processes in coordination with the Project Managers
- Assure NASA Readiness Review process is consistent with Key Decision Point (KDP) requirements
- Attend and provide feedback from NASA instrument and peer reviews, assuring requirements are met in coordination with the Program Scientist and the Project leads
- Provide oversight of the Program's Mission Assurance process through the Mission Assurance lead
- Serve as a member of the program interview panel for both NOAA and NASA employees as required
- Provides technical oversight and input to Program Control for GOES-R responses to external and internal technical inquiries with cognizant GOES-R division/project personnel

### **3.2.1.5.4 Program Scientist**

The Program Scientist will be a NOAA employee at the program office level charged with providing the link between the operational user community of GOES-R and the program office. The Program Scientist reports administratively to the SPD and functionally to the NESDIS AA. The Program Scientist will perform liaison functions with NASA as assigned by the SPD, but primary responsibility will be as science authority representing the user community to the program office. The Program Scientist will work in coordination with a Flight Project and Ground Segment Project Scientist to accomplish the specific duties listed below:

- Collaborates with the NOAA, NESDIS, and GOES user community to define the users' needs, operational requirements, and science data product requirements for the GOES-R mission
- Chairs the GOES-R Operational Requirements Working Group (GORWG)
- Provides the principal scientific guidance to the System Program Director throughout the lifecycle of the program.
- Serves as a member of the NOAA senior science staff
- Supports the formulation of the mission-level architecture of spacecraft and instruments to optimize scientific return

- Convenes science and application working groups to suggest revisions of the system requirements for senior management review and to review program accomplishments in coordination with Flight and Ground Segment Projects.
- Communicates with program and users on matters of inter-agency and international scientific coordination
- Ensures GOES-R user requirements and the program constraints, appropriate to the mission, are captured in the GOES-R Level I Requirements Document
- Provides support as key scientific advisor to the SPD in decisions that trade among performance, cost and schedule as well as decisions that trade among competing instrument suites and operational constraints on the spacecraft

#### **3.2.1.5.4.1 GOES-R Operational Requirements Working Group (GORWG)**

The GOES-R Operational Requirements Working Group (GORWG), working under the leadership of the GOES-R Program Scientist, is a system specific working group of the NOAA Observing System Council established to identify and represent NOAA user observational requirements.

The primary role of the GORWG will be to represent NOAA users whose observation requirements have been allocated to the GOES-R Series System through the Level I Requirements Document. Specific responsibilities of the GORWG are:

- Serves as the Focal point for all GOES-R Series operational requirements issues
- Supports the development of the GOES-R Series System Level I Requirements Document
- Provides a science assessment to the NOSC of optimal instrument configuration and system implementation for the GOES-R Series system
- Assesses user requirements impacts of the configuration change requests to the Level I Requirements
- Assesses anomaly impacts, mitigation strategies, including next launch needs

#### **3.2.1.5.4.2 GOES-R Series Technical Advisory Panels (TAPs)**

Technical Advisory Panels (TAPs) serve as Advisory Panels to the GOES Program Office (GPO), co-chaired by both a GORWG and GPO representative . Specific responsibilities include:

- Assess the GOES-R Program Requirements Level I Document and translate the GOES-R observational requirements into specific GOES-R technical specifications for the MRD
- Work with the users and the GOES Program Office on any user-requested modifications to L1 requirements and resulting modifications to the MRD
- Assess impacts to L1 requirements due to system constraints provided from the GOES Program Office
- Serve as an advisory board to the GORWG in its role of assessing operational requirements for decision by the NOSC
- Work with users on resolution of modifications needed to any L1 requirements due to GOES-R system constraints
- Serve as an advisory panel to any GOES Program Office Change Control Board (CCB) created to assess suggested changes to the MRD specifications
- Evolve from an advisory panel in the GOES-R Requirements Definition Phase to working groups supporting the GOES-R Development, Test, Implementation, Verification/Validation and Operations Phases

#### **3.2.1.5.5 Program Control**

Program Control provides the expertise required to manage the business and financial aspects of all GOES-R activities. The Budget Officer, who serves as the head of the Program Control, reports to the SPD and is responsible for the day-to-day monitoring, management and control of all budget and financial management activities. GOES-R Program Control will provide integrated support to all organizational elements within the GOES-R Program. Primary responsibilities include program-level strategic planning, action item management, policy development and coordination, Federal Managers' Financial Integrity Act (FMFIA) execution, communications, human resource administration and management services, budget formulation, execution, financial analysis and programmatic planning to include Earned Value Management (EVM), Capital Planning, property management and inventory control. A summary of Program Control responsibilities is provided below.

- Executes the program-level strategic management activities
- Facilitates integrated budget development and program control oversight functions with NESDIS AA and NOAA Chief Financial Officer
- Develops all related and back-up material for the NOAA Budget Process
- Oversees all capital planning (OMB 300) and other budgetary documents
- Integrate Project-supplied budget inputs into the GOES-R budget preparation and conduct programmatic defense
- Prepares coordinated GOES-R responses to external and internal NOAA information requests, and Congressional inquiries
- Coordinates all GOES-R NOAA/NESDIS/Program level actions
- Coordinates review of GOES-R, NOAA and external policy documents
- Maintains the GOES-R MCP, auditing GOES-R internal office procedures
- Facilitates the weekly Senior Management Team (SMT) meeting. This administration includes developing agendas, coordinating briefings and publishing meeting minutes
- Coordinates the development of all program-level briefings prepared for NOAA/NESDIS senior management and customers
- Implements and manages program-level logistics, communications, facilities support, human resource management and administrative support
- Manages the financial control and funds execution in accordance with SPD direction
- Matrixes personnel to the Projects and provide oversight of the EVM process.
- Manages the Workforce planning and support agreements as directed by SPD
- Track and reports contract performance in association with the Contracts Division
- Performs administrative functions for the program office

### **3.2.1.5.6 Contracts Division**

NOAA and NASA agree to form a collaborative GOES-R Program contracting partnership to ensure effective and efficient support for all GOES-R Program and Project contract actions. NASA and NOAA Contracting Officers will retain full agency authorities, respectively, and continue agency reporting responsibilities while operating in partnership with each other. Contracting Officers must have appropriate warrant authority as required by NOAA and NASA regulations, policies, and procedures. The partnership intends to collaborate by;

- Sharing of contracting staff resources for NASA and NOAA contracts
- Establishing action approval levels for Program review
- Operating within current NASA/NOAA processes, policies, and procedures

The GOES-R Contracts Division provides procurement authority and expertise required for planning and contracting GOES-R business-related matters while ensuring GOES-R compliance with the Federal Acquisition Regulation (FAR), local (DOC, NASA) acquisition regulations, as well as applicable DOC,

NOAA and NASA acquisition policies and procedures. The Contracts Division will be staffed as a matrix support activity with personnel from the NOAA Acquisition and Grants Office (AGO) organization and the NASA GSFC contracts office and will be located with the GOES-R Program. GOES-R Contracts Division will provide integrated support to all organizational elements within the GOES-R Program. A summary of the Contracts Staff includes the following responsibilities for Program Office Contracts, Flight Project Contracts and Ground Segment Project Contracts.

#### **3.2.1.5.6.1 Program Office Contract Chiefs**

- Acts as contract advisor to SPD
- Interacts with Flight and Ground Segment Project Contracting Officers for the purpose of maintaining communication relative to contractual matters.
- Provides Program review of GOES-R related acquisition planning and implementation documents (e.g. acquisition and source selection plans, solicitations, awards, and modifications)
- Works with other government contracting support organizations to meet GOES-R Program contract administration requirements
- Provides contractual advice to the SPD on all the GOES-R Award Fee efforts
- Coordinates interaction between Program Office, NOAA AGO contracting staff and NASA GSFC contracts office

#### **3.2.1.5.6.2 Flight Project Contracting Officers and Specialists**

- Utilizes NASA procedures as defined in the Goddard Procedural Requirements on Procurement (GPR-5100.1F)
- Reports to the GSFC Assistant Chief for GOES-R Procurement and matrixed to the Flight Project Manager in performance of their duties
- Provides bi-monthly summaries to the Program Office Contracting Officer
- Communicates contractual issues and actions that may have a significant effect on cost/schedule as they occur.
- Tracks and reports Flight Project contract performance and contract modifications in association with Program Control
- Authorizes, with SPD concurrence, changes to the GOES-R Flight Project contracts

#### **3.2.1.5.6.3 Ground Segment Project Contracting Officers and Specialists**

- Ensures all Ground Segment Project Contracts will be in accordance with NOAA AGO procedures and as specified in this section of the MCP
- Reports to NOAA AGO and matrixed to the Ground Segment Project Manager in performance of their duties
- Provides bi-monthly contractual summaries to the Program Office Contracting Officer
- Communicates contractual issues and actions that may have a significant effect on cost/schedule as they occur
- Tracks and reports NOAA Ground Segment Project contract performance and contract modifications in association with Program Control
- Authorizes, with SPD concurrence, changes to the GOES-R ground segment A&O contract, and other NOAA-managed contracts as they relate to the Ground Segment

#### **3.2.1.5.7 Program Systems Engineering (PSE)**

The Program Systems Engineering lead reports to the SPD and is responsible for end-to-end systems integration, planning, coordination, and adjudication of the space and ground segments for the GOES-R Program Systems Engineering functions. The Program Systems Engineer will initially be staffed by a NASA person, but the goal is to eventually transition the PSE lead to a NOAA person. Both NOAA and NASA retain significant involvement in the Systems Engineering and Integration function. As NOAA

systems engineering experience, organizational and training infrastructure mature, a viable NOAA senior systems engineer will eventually be selected to assume the GOES-R PSE lead. The Program Systems Engineering Lead's duties and responsibilities are:

- Perform verification of GOES R System to ensure that Level 1 requirements are met.
- Defines, documents, and manages Level 2a requirements for the GOES-R architecture and end-to-end performance in coordination with GOES-R mission internal and external stakeholders including continuity of operations
- Defines, documents, and manages the GOES-R program systems engineering processes ensuring End-to-End systems integration and performance in accordance with the MCP and the Systems Engineering Management Plan (SEMP)
- Provides recommendations to SPD for standards, references, and technical tools to be applied on the GOES-R Series program
- Provides periodic reports to the SPD on status issues, problems, deviations/waivers and corrective actions associated with program systems engineering efforts
- Conducts, in support of the GOES-R SPD, program level technical reviews and convening working groups on program level issues
- Oversees the program level risk management process
- Chairs the GOES-R Program Engineering Change Review Board (ECRB) for changes to the Level 2 requirements and other program documents
- Performs configuration management of necessary interface requirements and interface control documents in coordination with Flight and Ground Segment Projects
- Develops program level configuration management process
- Manages cross project and program level technical margins in coordination with Flight and Ground Segment Projects
- Performs program level baseline and trade studies, technical analyses, and engineering peer reviews
- Co-chairs any joint systems engineering working groups within NOAA/NESDIS or NASA as required
- Serves as the focal point for any GOES-R continuity of operations (COOP) issues in coordination with the Ground Segment Project
- Participates in the GORWG in an advisory capacity.

### **3.2.1.5.8 Mission Assurance**

The Program Mission Assurance Manager (PMAM) serves as the mission assurance focal point for the Program Office and leads the team of assurance engineers and segment Mission Assurance Managers (MAMs) that support the program and its projects. The Program Mission Assurance Manager is matrixed to the program office, and maintains an independent reporting path to the NASA GSFC Office of Systems Safety and Mission Assurance (OSSMA).

Specific disciplines within the Assurance Management functions include:

- Systems safety, industrial safety, quality assurance, reliability, parts control, materials and process control, environmental verification, contamination control, workmanship standards and processes, software assurance, and design/technical reviews of all systems and instruments

Specific responsibilities include:

- Manages and directs the overall mission assurance activities
- Formulates approaches and concepts and provides the recognized technical leadership and engineering responsibility in execution of the assurance management functions of the program

- Ensures the generation and implementation of the Systems Safety Plan
- Conducts assessments of the Mission Assurance functions to ensure that proper levels of effort are being expended
- Ensures program deficiencies are being identified and corrected
- Ensures that assigned mission assurance personnel are properly directed and motivated to produce the best feasible product.
- Supports Program Systems Engineering to ensure spacecraft, instruments and ground systems meet Mission Assurance objectives

### **3.2.1.5.9 Flight Project Manager (FPM)**

The Flight Project Manager (FPM) reports functionally to the SPD and receives line supervision from the GSFC Code 400 Director of Flight Projects in accordance with NASA personnel policy. The GOES-R FPM is responsible for all aspects of the Flight Project development and implementation lifecycle including conformance to GOES-R technical performance, cost, and schedule requirements. FPM is responsible for overseeing the contractor development and implementation of satellite, launch vehicle and related efforts. This includes acquiring, developing and deploying a satellite system that generates earth observation imagery in response to user needs. The FPM works with other SMT members to oversee the development of the GOES-R architecture. The Flight Project Manager's specific responsibilities include:

- Manages and implements the GOES-R Space segment
- Manages and oversees the acquisition of individual instruments and spacecraft
- Reports functionally to the SPD
- Manages the Flight Project budget, including allocated reserve
- Controls and assesses all project activities consistent with the program/project plans
- Works with the Program Systems Engineer and the Ground Segment Project Manager to confirm contractor deliverables meet the Ground Segment Project needs and requirements
- Works with System Program Director, Program Systems Engineer and the Ground Segment Project Manager to effect the resolution of all critical and potential program problems
- Leads the development and control of flow down requirements as they pertain to the Flight segment from Level 2 to lower levels in accordance with Configuration Management Plan
- Provides continuous risk management assessments, mitigations, and work-around identifications and implementations to the SPD

### **3.2.1.5.10 Ground Segment Project Manager (GSPM)**

The Ground Segment Project Manager (GSPM) reports directly to the SPD. The GOES-R GSPM is responsible for all aspects of the ground segment project development and implementation lifecycle including conformance to GOES-R technical performance, cost, and schedule requirements. The GSPM is responsible for all aspects involved in the design, development, implementation, integration, test, transition of the GOES-R ground segment to safely operate the GOES-R space segment and to produce earth observation products in response to program approved requirements. The GSPM works with other SMT members to oversee the development of the GOES-R architecture and associated technology roadmap. The Ground Segment Project Manager's specific responsibilities include:

- Manages and implements the GOES-R ground segment consistent with program/project plans
- Reports directly to the SPD
- Manages the Ground Segment Project budget, including allocated reserve
- Controls and assesses all project activities consistent with the program/project plans
- Works with the Program Systems Engineer and the Flight Project Manager to confirm contractor deliverables meet the Ground Segment Project needs and requirements
- Works with System Program Director, Program Systems Engineer and Flight Project Manager to resolve all critical and potential program problems.

- Leads the development and control of flow down requirements as they pertain to the Flight segment from Level 2 to lower levels in accordance with Configuration Management Plan
- Provides continuous risk management assessments, mitigations, and work-around identifications and implementations to the SPD

### **3.2.1.5.11 GOES-R Legal Counsel**

The DOC GOES-R legal counsel team consists of one DOC OGC Contract Law Division (CLD) staff attorney who serves as the primary point of contact for all legal matters arising from the GOES-R acquisitions and contracts administration, and also of two other CLD attorneys that support or supervise the line attorney. Members of the DOC GOES-R legal counsel team are full members of the GOES-R program.

The DOC GOES-R legal counsel provides legal, contractual, and law-related technical advice and support to the GOES-R system program director. Such support necessarily extends to matters pertaining to all aspects of the program and its projects. Because complete information is a prerequisite to rendering sound and effective legal advice, the DOC GOES-R line attorney must enjoy access to program and project-related information that is pertinent to all counsel activities. That information includes, but is not limited to financial, cost, schedule, technical, programmatic and other relevant business information pertaining to the GOES-R program, Ground Segment Project, and Flight project. The DOC GOES-R legal team will coordinate with appropriate NASA officials to access GOES-R information that is the exclusive property of NASA. The DOC GOES-R legal team also will have access to and interaction with program and project staff and attendance at meetings pertinent to legal counsel's activities. Cooperation with the GOES-R legal team is essential for successful program execution and should be treated as such by all program and project staff.

## **3.2.2 Stakeholders**

Stakeholders are organizations who contribute to the GOES-R program's mission success. Stakeholders participate in GOES-R development and operations, as specified in lower-level agreements. The interface with each stakeholder is briefly described in the subsections that follow.

Stakeholders are also identified in the GOES-R CONOPS document Section 4.3 User Description.

### **3.2.2.1 National Weather Service (NWS) Stakeholders**

The National Weather Service (NWS) uses GOES data for critical functions including forecasting and providing intensity estimates of hurricanes, identifying and tracking severe weather, issuing watches and warnings for severe weather and winter weather, analyzing forest fires (and resultant smoke), assimilating GOES data into numerical weather prediction models, and monitoring space weather. GOES uses data from NWS Data Collection Platforms (DCPs) and numerical weather prediction models for the creation of higher order GOES-R products.

#### **3.2.2.1.1 NWS Network Control Facility (NCF)**

GOES-R will provide satellite imagery and products to the NWS Network Control Facility (NCF) in Silver Spring, MD, for use in NWS facilities. The NCF combines GOES-R data with radar, numerical weather prediction, in situ, text products and forecasts, and delivers them to the NWS Weather Forecast Offices and River Forecast Centers for use in the forecast and warning process.

#### **3.2.2.1.2 National Centers for Environmental Prediction (NCEP)**

GOES-R data and products will be delivered to NCEP and used for aviation weather, climatological analysis, environmental modeling, hydrometeorological forecasting, ocean prediction, space environment monitoring, storm prediction, and tropical weather forecasting.

### **3.2.2.1.3 National Weather Service Telecommunications Gateway (NWSTG)**

The NWSTG acts as a switching station, receiving GOES products and delivering the data to the international community. Surface and other in situ data are routed from field sites back to NWSTG for use in GOES product processing.

### **3.2.2.1.4 Emergency Managers Weather Information Network (EMWIN)**

NWS will send EMWIN data to GOES-R for relay and dissemination.

## **3.2.2.2 NESDIS Stakeholders**

NESDIS components that contribute to the mission of GOES-R include; the Office of Satellite Data Processing and Distribution (OSDPD), the Office of Satellite Operations (OSO), Office of Satellite Development (OSD), STAR and Data Centers.

### **3.2.2.2.1 Office of Satellite Data Processing and Distribution (OSDPD)**

The OSDPD will provide the following functions for GOES-R:

- Participates in GOES-R ground segment reviews for design, development, implementation, integration, testing, and transition to operations.
- Manages and operates GOES-R for product generation and distribution once operational.
- Generates and provides augmented products and other services to OSDPD users.
- Coordinates with the GOES-R direct broadcast community to communicate changes in broadcast services.
- Sends low-rate information transmission (LRIT) data to GOES-R for rebroadcast to LRIT user community.
- Brokers requests for instrument scanning mode changes between the requestor and GOES-R satellite operations.
- Provides 24/7 user help desk for GOES-R ground segment product generation and distribution services to operational users.

### **3.2.2.2.2 Office of Satellite Operations (OSO)**

OSO will provide the following functions for GOES-R:

- Participate in the development and review of requirements and specification documents in advance of the source selection activity.
- Participate in the source selection activity for the ground segment.
- Participate in the GOES-R ground segment reviews for design, development, implementation, integration, testing and transition to operations.
- Manage and operate the GOES-R mission management and enterprise management system.
- Manage and operate the functions at the ground acquisition site, WCDAS.



- Perform engineering management, trending, and analysis for the GOES-R spacecraft.
- Manage the GOES-R backup facility and its operation.
- Participate in procedures and plan reviews
- Participate in space and ground design reviews
- Member of the Source Selection Team for ground
- Approval on Mission Ops Products:
  - Routine Ops Procedures
  - Contingency Ops Procedures
  - PLT test reviews
  - SOE's
  - scripts,etc.
  
- Participate in training and mission simulations, Ground System integration and testing.
- Membership on PLT teams as sub-system engineers.
- Participate in development operations transition plans and training operational crews.

### **3.2.2.2.3 Office of Satellite Development (OSD)**

OSD will support the GPO in sustaining engineering, maintenance, and technology refresh of GOES-R Ground Segment assets. OSD will also support the definition, design, and implementation of new systems into the GOES-R environment. The OSD Ground Systems Division will be responsible for long-term refresh and sustainment activities required for the ground system. OSD will provide technical support to the Program Systems Engineering Team.

### **3.2.2.2.4 Satellite Applications and Research (STAR)**

The center for Satellite Applications and Research (STAR), formerly Office of Research and Applications (ORA) is the home of the Algorithm Working Group (AWG). The AWG will develop scientific algorithms for each GOES-R product and supply proxy data for simulating system inputs and outputs. The AWG will also assist the contractor during calibration and validation activities. All AWG products will be delivered first to the Ground Segment Project Manager (GSPM) for evaluation. The GSPM will then provide the materials to the GS prime contractor as “Government Furnished Information (GFI). The algorithm development process is outlined in the Algorithm Development Management Plan for Ground Segment Product Generation

### **3.2.2.2.5 Data Centers**

There are two NESDIS data centers that archive GOES-R data:

- National Climatic Data Center (NCDC), one node of CLASS: GOES-R will provide data to NCDC for long term archive
- National Geophysical Data Center (NGDC), one node of CLASS: GOES-R will provide data to NGDC for long term archive

## **4 MANAGEMENT APPROACH**

### **4.1 Acquisition Management**

#### **4.1.1 Source Selection Evaluation Board Process**

NOAA and NASA roles and responsibilities for source selection are documented in the MOU. The ground segment source selection processes will follow the Federal Acquisition Regulation (FAR), and

NOAA acquisition policies. The space segment source selection process will follow the FAR and the NASA FAR supplement.

For space segment procurements, NOAA will participate in NASA acquisition and contract execution activities as identified in the approved acquisition strategy, including, at a minimum: The NESDIS AA will attend any Source Evaluation Board (SEB) briefings to the NASA Source Selection Official (SSO) concerning this acquisition or the source selection thereof.

The NASA space procurement strategy and source selection approach will be reviewed and approved at the NASA Headquarters-Level Procurement Strategy Meeting. NASA procurement authority has been delegated to the Goddard Space Flight Center. GSFC and GPO will review and approve the RFP package.

The NOAA ground procurement strategy and source selection approach will be reviewed and approved by NOAA and NOAA NITRB, GPO, AGO and DOC.

Approval for release of each RFP will follow the Gateway and Entrance Review process outlined in section 4.4.

NASA will provide the Source Selection Official (SSO) for the space procurements and NOAA will provide the SSO for the ground procurements. Both the Space and Ground segment Source Evaluation Boards (SEB) will have NOAA and NASA personnel. Throughout the NASA source selection process, the NESDIS AA will participate in SSO briefings.

The NESDIS AA will be afforded a reasonable opportunity to provide comments, ask questions and express concerns orally and/or in writing to the SSO to consider prior to the SSO's selection. In all cases, a written NESDIS assessment will be provided.

## **4.2 Contracts Management**

When acquiring goods and services in support of the GOES-R program, all program office and project office personnel will utilize the FAR, respective agency supplemental (DOC, NASA) acquisition regulations, as well as respective NOAA and NASA acquisition policies and procedures. Contracting Officer's Technical Representatives (COTR) will be specifically designated by a NOAA or NASA Contracting Officer in accordance with agency training requirements. COTRs will coordinate appropriate contracting activities with the NOAA or NASA contracting officer in accordance with applicable regulations. The following table shows contracts management controls.

Control Objective/Risk	Management Control	Documentation Source
Ensure acquisition plans represent sound business approach to acquiring goods and services	Acquisition plans above values designated in the respective DOC, NOAA and NASA policies and procedures are reviewed by senior acquisition officials. NOAA Acquisitions must be reviewed by the DOC Acquisition Review Board and Commerce IT Review Board (CITRB) as required.	FAR, CAR, NASA FAR Supplement, Commerce Acquisition Manual, NOAA Acquisition Handbook, local NOAA/NASA policies
Ensure prospective solicitations and contracts comply with FAR, and applicable NOAA and NASA regulations	Prospective NOAA contracts are reviewed by NOAA AGO review panel and DOC Office of General Counsel.  For Flight Project contracts managed by Goddard, the current version of the Goddard Procedural Requirements (GPR) 5100.1 will be followed.	Commerce Acquisition Manual, NOAA Acquisition Handbook  Goddard Directive Management System
Ensure communication between the Program Office and Project Office	Assignment of GOES-R Program Office Contracting Officer – Project Contracting Officers are required to provide a brief summary of status to Program Office Contracting Officer bi-monthly and communicate contractual issues and actions that may have a significant effect on cost/schedule as they occur.	Management Control Plan

**Figure 7 Contracts Management Controls**

### 4.2.1 Performance Management

NOAA and NASA roles and responsibilities for Award Fee determination are documented in the MOU. The projects will develop an award fee plan for each acquisition, and coordinate such with NOAA and NASA as applicable. The GOES-R program office will develop a process to jointly evaluate applicable aspects of the flight and ground segment contracts.

Contractor performance will be assessed on a periodic basis and will consider management, cost, schedule and technical performance.

The award fee process will be implemented according to the respective Performance Evaluation Plans (PEPs) for each implementation contract. The SPD will concur with the Award Fee Plan for flight and Ground Segment Projects, NESDIS may concur as well to both projects' Award Fee plans. For major elements, spacecraft contract and ground contract, the GOES-R System Program Director (SPD) will chair the Award Fee Performance Evaluation Boards (PEBs). The PEBs are responsible for evaluating contractor performance, based upon the approved PEP. Depending on the contract, the PEB Chairman will make fee recommendations to the appropriate Fee Determination Officials (FDOs). For NOAA, the FDO will be the NESDIS AA. For NASA, the FDO will be the GSFC Director of Flight Projects. For the spacecraft contract, prior to a final fee decision, the NASA FDO will provide rationale for the fee determination to the NESDIS Assistant Administrator (AA). The NESDIS AA will be given reasonable opportunity to provide a written or verbal assessment on the intended award fee decision to the FDO prior to the award fee decision. For instruments, the SPD will be given reasonable opportunity to provide a written or verbal assessment on the intended award fee decision to the FDO prior to the award fee decision. In all cases, a written NESDIS assessment will be provided.

Contracting Officer will provide the award fee ratings for each GOES-R contract to the program office after each contract's rating period. The GPO will prepare a summary of contract performance evaluations and submit it to NESDIS twice a year. The report will include summary ratings for each PEB held during that period, along with a running trend of ratings for each contract and a summary of significant activities to aid in the illustration of the ratings. NOAA, DOC and NASA will treat such summaries as

procurement sensitive information and require its employees to take reasonable precaution in maintaining the confidential status of such summaries and any related information.

The GOES-R Program Office Contracting Officer will ensure that the Performance Evaluation Plans (Award Fee Plan) for the spacecraft and ground contracts have provisions for the evaluation of effective systems integration at the program level.

The Flight Project Manager, or his designee, is the PEB Chairman for the GOES-R instrument contracts.

On an annual basis, the NESDIS AA and NASA counterpart will conduct a joint review of the effectiveness of the award fee determination process for the GOES-R program. Findings and recommendations will be reported to the DUS and to DOC.

### **4.3 Technical Authority**

The technical authority (TA) process outlined in NPR 7120.5D is explicitly adapted herein to suit the unique inter-agency structure of the GOES-R Program. The GOES-R Technical Authority Model applies with equal force to both the Flight Project and the Ground Segment Project. The GOES-R Technical Authority Model establishes a system of checks and balances to ensure that technical decisions having significant impact on the GOES-R Program are not arbitrarily made. The technical authority process allows the designated TA to elevate a technical disagreements having significant impact on the GOES-R Program or Projects to the appropriate level of technical oversight. The GOES-R Technical Authority Model should not be construed to deprive the SPD or the Project Managers of their ultimate responsibility for the respective Program or Project success in conformance with governing requirements.

Infrequent circumstances may arise when a Technical Authority or the Program/Project Manager may disagree on a proposed programmatic or technical action and judge that the issue rises to a level of significance that the next higher level of management should be involved. In such circumstances:

- a. The Program/Project Manager (or Chair of the controlling board) has the authority to make a decision while resolution is attempted at the next higher level of Programmatic and Technical Authority.
- b. Resolution should occur prior to implementation whenever possible. However, the Program/Project Manager may proceed at risk in parallel with pursuit of resolution if they deem it in the best interest of the program/project. In the event that the Project Manager determines that proceeding with a proposed course of action is in the best interest of the program although the TA dispute has not been resolved, the Project Manager shall inform the Program Manager of such rationale and seek the specific authorization of the SPD before proceeding
- c. Resolution should be attempted at successively higher levels of Programmatic Authority and Technical Authority until resolved

There are three distinct types of technical authority-- Engineering technical authority, Safety and Mission Assurance (SMA) technical authority and Science technical authority. These technical authorities are separate entities, focused on different aspects of requirements as described in this document.

#### **4.3.1 Engineering Technical Authority (ETA)**

For the GOES-R Program, engineering technical authority is exercised by the Program Systems Engineer. For the Flight Project, the TA is the Project Systems Engineer. For the Ground Segment Project, the TA is the Operations Systems Engineer.

Oversight of the Technical Authority process for the flight project is by the Applied Engineering and Technology Directorate (AETD) Branch and Division management. Additional technical oversight for flight is provided via the NOAA program office system engineering team, and any other individual that may be designated by the DUS. For the Ground Segment Project, oversight will be a joint effort between

NESDIS OSD and NASA AETD. The Project level ETAs are responsible for coordination with the Program TA.

The GSFC Director of Applied Engineering and Technology and NESDIS Deputy Assistant Administrator for Systems (DAAS) will provide a forum to hear appeals of the Program Level TA.

#### **4.3.2 Safety and Mission Assurance Technical Authority (SMATA)**

For the GOES-R Program, mission assurance technical authority is exercised by the Program Mission Assurance Manager. For the Projects, the SMATA is the Project Mission Assurance Manager.

Oversight of the Technical Authority process for both projects will be provided by the GSFC Office of Systems Safety and Mission Assurance (OSSMA). Additional mission assurance technical oversight for both projects is provided via the NOAA program office system engineering team, and any other individual that may be designated by the DUS. The Project level TAs are responsible for coordination with the Program TA.

The GSFC Director of Office of Systems Safety and Mission Assurance and NESDIS Deputy Assistant Administrator for Systems (DAAS) will provide a forum to hear appeals of the Program Level SMATA.

#### **4.3.3 Science Technical Authority**

For the GOES-R Program and projects, science technical authority is exercised by the Program Scientist.

Technical oversight will be NESDIS with support from the NOAA Observing Council (NOSC).

The NOSC (chaired by the NESDIS and National Weather Service AAs) will provide a forum to hear appeals of the Program Scientist.

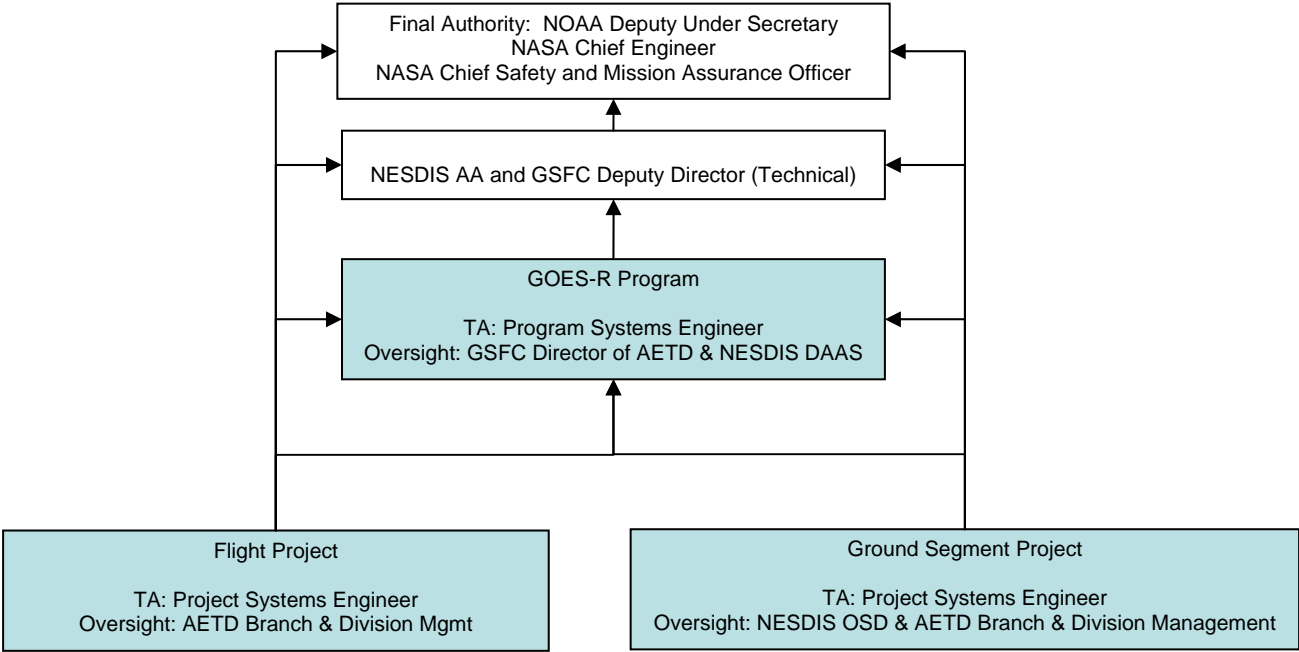
#### **4.3.4 Technical Authority Appeal Paths**

If the issue is not resolved in the above forums, respective program appeal authorities, will brief the NESDIS AA (NOAA) and the GSFC Deputy Director regarding the facts, details, and impacts of the technical disagreement between the PSE or Mission Assurance and the SPD. The NESDIS AA and the GSFC Deputy Director will meet to resolve the issue.

If no resolution is achieved at this level, the NESDIS AA and GSFC Deputy Director will brief the NOAA Deputy Under Secretary (DUS), NASA Chief Engineer (for flight project), and NASA Chief Safety and Mission Assurance Officer (for mission assurance) regarding the facts, details and impacts of the technical disagreement.

The NOAA DUS has ultimate authority to resolve the disagreement.

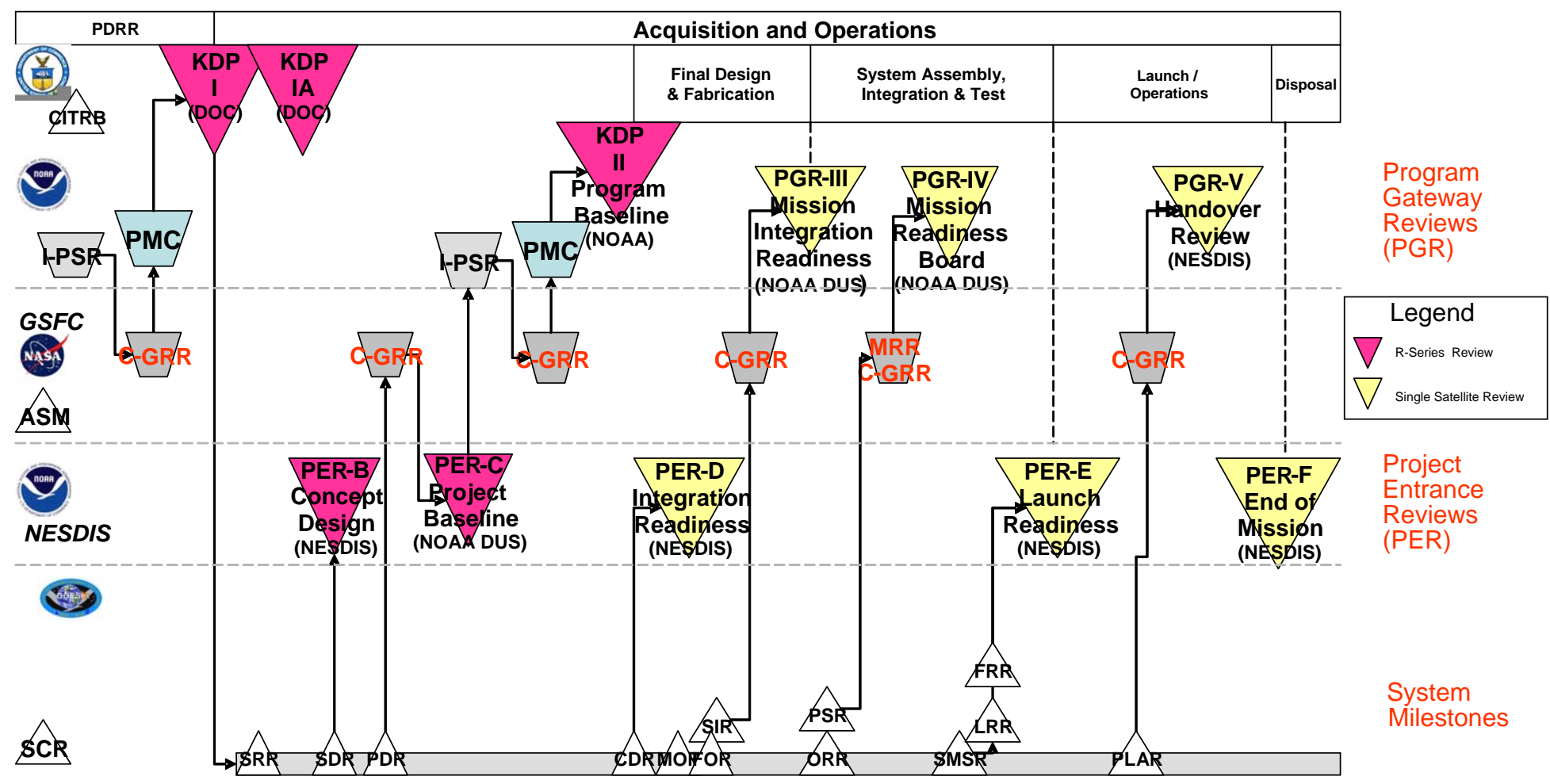
# GOES-R Technical Authority Appeal Process



**Figure 8: GOES-R Technical Authority Appeal Process**

## 4.4 Lifecycle Assessment Reviews

The GOES-R program will execute a series of reviews that assess health and status of the program and projects throughout the life of the program and provide approval to proceed to the next phase. Most current version of System Milestones are described in the System Review Plan (SRP) (P417-R-PLN-0052). Figure 8 outlines those reviews along with accompanying program and project milestones.



**Program Gateway Reviews (PGR)**

**Project Entrance Reviews (PER)**

**System Milestones**

Legend	
	R-Series Review
	Single Satellite Review

**ACRONYMS**

ARB	Acquisition Review Board	FOR	Flight Operations Review	MCP	Management Control Plan	PDR	Preliminary Design Review	SCR	System Concepts Review
ASM	Acquisition Strategy Mtg	FRR	Flight Readiness Review	MDR	Mission Definition Review	PDRR	Program Definition and Risk Reduction	SDR	System Definition Review
CITRB	Commerce IT Review Board	I-PSR	Independent Review Team Program Status Review	MOR	Mission Operations Review	PLAR	Post Launch Assessment Review	SIR	System Integration Review
CDR	Critical Design Review	KDP	Key Decision Point	MRR	Mission Readiness Review	PER	Pre-Environmental Review	SMSR	Safety and Mission Success Review
C-GRR	GSFC CMC Gateway Readiness Review	LRR	Launch Readiness Review	ORR	Operational Readiness Review	PSR	Pre-Shipments Review	SRR	System Requirements Review

**Figure 9: GOES-R Assessment Reviews and Milestones**

## 4.4.1 Key Decision Points

There are three Key Decision Points remaining for the GOES R program, KDP I (equivalent to DAO KDP C/D), KDP-IA and KDP II. The Secretary of Commerce is the designated Milestone Decision Authority for Department of Commerce Milestone Decisions, and is the approval authority for KDP-I and IA. The Secretary may delegate the authority to the NOAA Administrator (Under Secretary for Oceans and Atmosphere). The NOAA Administrator is the approval authority for KDP-II.

- KDP I (DAO KDP C/D): Authority to proceed to implementation (acquisition and operations) phase. For GOES-R, upon receipt of procurement authority, this allows program to begin the source selection processes for the spacecraft and ground systems.
- KDP IA: Approval to Exercise Options: At this review, NOAA will request authority to exercise contract options on the spacecraft contract for additional spacecraft and related ground system contract options. KDP IA must occur in sufficient time to permit properly-phased adjustments to the NOAA and DOC budget submittals.
- KDP II: Program Baseline Review: Budget and Schedule baselines are established for DOC and congressional oversight purposes. This is the baseline to which NOAA will hold the GOES-R program accountable.

## 4.4.2 Program Gateway Reviews

GOES R program will face a series of readiness reviews and Gateway Reviews to determine readiness for KDPs and to transition between major lifecycle phases. The NOAA PMC, chaired by the Deputy Under Secretary for Oceans and Atmosphere is the decision forum for the Gateway Reviews. Each of these reviews will be preceded by a GSFC CMC readiness review, the results of which will be presented as an advisory assessment to the NOAA PMC prior to the Gateway Review decision.

With the exception of Program Gateway V, NOAA DUS is the decision authority.

- KDP I Readiness. The program will certify readiness that program concept and mission level requirements are defined, budget and schedule are appropriate for the scope, and program/project plans and documents are of sufficient maturity to proceed to acquisition and operations phase.
- KDP II Readiness. The program will certify readiness for program baseline and KDP II. Occurs after the mission level Preliminary Design Review.
- Program Gateway Review III: Mission Integration Readiness: The Program will certify that the projects are prepared to be integrated into an end to end GOES-R system. This transition is uniquely a "soft gate," in which the program may initiate integration work immediately, absent a notice of discontinuance by the NOAA DUS.
- Program Gateway Review IV: Mission Readiness Review: The program is prepared to solicit Kennedy Space Center led Flight Readiness and Launch Readiness Reviews in preparation for satellite launch and ground system operation.
- Program Gateway Review V: Handover Readiness: Program certifies readiness to transition observatory to the flight operations team. The decision authority for this gateway is the NESDIS AA.

## 4.4.3 Project Entrance Reviews



GOES R projects will face Entrance Reviews to transition to the next major phases in their acquisitions. The Project Entrance Reviews are briefly described below along with supporting milestones. The NESDIS AA is decision authority except as noted below

- Entrance Review B: Concept Design: marks the completion of the Segment Concept development phase and the entry into Project Baseline Phase.
  - Supporting milestones: Concept Review, Requirements Review
- Entrance Review C: Project Baseline: marks the completion of Project Baseline and successful project PDR completion. Project Entrance Review-C also marks the entry into the Final Design and Fabrication Phase for each satellite. NOAA DUS is decision authority.
  - Supporting milestones: Preliminary Design Review
- Entrance Review D: Integration Readiness: marks successful completion of project System Integration Review, completion of Final Design and Fabrication phase and commencement of System Assembly Integration and Test phase. This transition is uniquely a "soft gate," in which the project may initiate integration work immediately, absent a notice of discontinuance by the NESDIS AA.
  - Supporting Milestones: Critical Design Review,
- Entrance Review E: Launch Readiness: signals completion of project level flight, safety and mission success and launch readiness reviews. Project Entrance Review-E marks the beginning of the Launch and Operations phase.
  - Supporting Reviews: Pre-Environmental/Pre test review, Flight Operations Review, Flight Readiness Review, Mission Operations Review, Safety and Mission Assurance Review, Mission Readiness Review
- Entrance Review F: End of Mission: signals completion of operational use of the system and beginning of the disposal phase.

Decision Authorities for each assessment review are summarized in the table below:

Decision Point / Decision Authority	KDP I	Entrance Review B	Entrance Review C	KDP IA	KDP II	Entrance Review D	Gateway Review III	Gateway Review IV	Entrance Review E	Gateway Review V	Entrance Review F
	DOC	NESDIS AA	NOAA DUS	DOC	NOAA US	NESDIS AA	NOAA DUS	NOAA DUS	NESDIS AA (DAAS)	NESDIS AA	NESDIS AA

**Figure 10: Assessment Reviews and their Decision Authorities**

#### 4.4.4 Acquisition Reviews

Procurement activities will occur parallel to and independently of the KDP process. Program must ensure that an adequate procurement strategy is in place prior to KDP I and that final RFPs are not released until after KDP I. It is the program's intent to schedule acquisition strategy briefings with KDP readiness.

Project RFP packages may begin their detailed review cycles prior to the Ground Acquisition Review Board and Flight Acquisition Strategy Briefing. However, projects must ensure that requirements of the strategy reviews are incorporated into the procurements prior to release.

Acquisition Strategy briefings must address:

- Lessons learned from draft RFP
- Risk
- Alternatives studied
- Contract structure
- Award Fee strategy

- Evaluation structure

## 4.4.5 Lifecycle Assessment and Acquisition Review Processes

The key actions required in advance of each KDP are described in this section.

### 4.4.5.1 KDP I and RFP release

Before KDP-I, several key actions must occur and technical decisions must be made in order to preserve program schedule for KDP I and RFP release. These include:

- NASA Procurement Strategy Meeting (DOC and NOAA invited)
- Flight draft RFP package review, GSFC and GPO
- NOAA IT Review Board
- Flight draft RFP release
- Ground draft RFP package review, GPO, NOAA AGO
- Ground draft RFP release, AGO decision authority
- Commerce IT Review Board for ground
- IRT review
- Program documents delivered to NESDIS
- GSFC CMC KDP readiness reviews for Flight and Ground
- GSFC CMC advisory assessment to NOAA PMC outlining project readiness for KDP I
- NOAA PMC KDP Readiness Review
- Readiness brief to US
- Flight acquisition strategy brief to NOAA
- Ground Acquisition Review Board
- Flight RFP package review, GSFC
- Ground RFP package review, NOAA
- KDP Readiness Brief to NOAA Under Secretary
- KDP Readiness Brief to DOC (unless delegated to NOAA Under Secretary)

#### KDP I Briefing Content

Readiness for KDP requires an appropriate level of maturity of system concept and requirements, budget and schedule as well as program procedures and processes. In order for the program to demonstrate readiness, KDP briefings must address:

- System Concept
- System Requirements (Level 1)
  - Requirements Flow to projects
  - System Changes from KDP B to KDP I
- Management Structure and Organization
- Results of independent review
- Total Life Cycle Budget with fiscal year phasing
  - Program Office Estimate to ICE reconciliation

### 4.4.5.2 KDP-II

#### KDP II Key actions

- Complete required independent reviews
- GSFC CMC Readiness Review
- NOAA PMC Review
- DUS assessment of readiness to US
- KDP Readiness Brief to NOAA Under Secretary
- KDP Readiness Brief to DOC (unless delegated to NOAA Under Secretary)

#### KDP II Briefing content:

- System Concept
- System Requirements (Level 1)
  - Requirements Flow to projects
  - System Changes from KDP I to KDP II
- Management Structure and Organization
- Results of independent review
- Total Life Cycle Budget with fiscal year phasing
  - Program Office Estimate to ICE reconciliation

### **4.4.5.3 Program Gateway Review III**

Complete required independent reviews  
GSFC CMC Readiness Review  
NOAA PMC action for closure  
DUS action determination

### **4.4.5.4 Program Gateway Review IV**

Complete required independent reviews  
GSFC CMC Readiness Review  
NOAA Special PMC Review  
DUS determination of readiness

### **4.4.5.5 Program Gateway Review V**

Complete handover reviews  
NESDIS DAAS Briefing  
NESDIS AA Briefing  
NESDIS AA determination of readiness

### **4.4.5.6 Project Entrance Review B**

Project complete Project Concept and Definition Review  
SRB chairs present summary results to GSFC Deputy Director and NESDIS AA  
Project present results to CMC and PMC at next monthly status review  
Proceed to project baseline phase

### **4.4.5.7 Project Entrance Review C**

Complete Project Preliminary Design Review  
Baseline readiness review with GSFC CMC  
Baseline readiness confirmation with NOAA PMC  
DUS determines baseline

#### **4.4.5.8 Project Entrance Review D**

Complete project integration readiness review  
SRB presents summary results to GSFC Deputy Director and NESDIS AA  
Project presents results to CMC and PMC at next monthly status review  
Proceed to integration and test

#### **4.4.5.9 Project Entrance Review E**

Complete Launch Readiness and Flight Readiness Reviews

#### **4.4.5.10 Project Entrance Review F**

Complete end of mission reviews  
NESDIS DAAS Briefing  
NESDIS AA Briefing  
NESDIS AA determination of readiness

### **4.4.6 Product Maturity for Gateway Reviews**

#### KDP I Product Maturity

The following documentation shall be considered in the KDP I (DAO KDP C/D) decision to proceed to the Acquisition and Operations Phase. NOAA will certify to the DOC Procurement Executive that all of the documents have been delivered and approved by the appropriate NOAA official.

- Level I requirements document – DUS approved
- Concept of Operations – SPD approved
- Acquisition Strategy Flight – NASA Procurement approved (briefed to DOC)
- Ground Acquisition Plan/Strategy – NOAA approved
- IT Security checklist – NOAA CIO approved
- Technical Readiness Level assessment – SPD approved
- Test and Evaluation Concept – SPD approved
- Risk Management Plan – SPD approved
- Systems Engineering Management Plan – SPD approved
- Management Control Plan – NESDIS AA/GSFC Center Director approved
- Staffing Plan – SPD approved
- Independent Review Team report
- Mission Assurance Requirements – SPD, GSFC Code 300 approved
- Mission Requirements Document – SPD approved
- Initial Integrated Master Schedule – SPD approved
- OMB 300 (includes the acquisition strategy and baseline budget) – NOAA CFO/NOAA CIO approved

The product maturity matrix for each Program/Project Gateway Review (KDP) is outlined in Appendix C, current at the time of MCP signature. Updates to the document matrix will be found in the GOES-R System Review Plan (P417-R-PLN-0052)

## **4.5 Independent Review**

The purpose of the Integrated Independent Reviews (IIRs) is to add value and reduce risk through the infusion of expert knowledge that is independent of the subject product development activity. The IIR Teams' roles are advisory to the convening authorities and do not have authority over any Program

content. These reviews provide expert assessment of the technical and programmatic approach, risk posture, and progress against the program baseline.

GOES-R Systems Review Plan (SRP) –P417-R-PLN-0052, establishes a plan for conducting a comprehensive set of Integrated Independent Reviews (IIRs) at all levels of the GOES-R Program at critical project milestones. The SRP identifies two primary review bodies—the NOAA Independent Review Team and the Standing Review Board. The specific roles of each are covered in subsequent subsections. The Program and Projects have specified milestones in each phase which require the convening of the Standing Review Board to assess completion.

Each IIR assesses the results of activity to date, including recommendations from a robust set of engineering peer reviews, to systematically evaluate technical and programmatic status using applicable objectives and success criteria for the particular milestone, thereby providing independent findings and recommendations to the GOES-R Program as well as to NASA and NOAA management.

A review team’s role is advisory to the Program and the convening authorities and does not have authority over any Program content. When appropriate, it may offer recommendations to improve performance and/or reduce risk. Its outputs are briefed to the GOES-R Program prior to being reported to GSFC CMC and NESDIS.

The GOES-R Projects will fully support the IIRs by providing required documentation and participation. They will keep track of the review milestones on their master schedules. In the event that the time between a milestone review and the next milestone review exceeds twelve (12) months an interim review may be called at the discretion of the GOES-R Program Office or the Standing Review Board co-chairs.

In addition to critical milestone reviews, there is a series of three Joint Readiness Reviews: Mission, Flight, and Launch. In addition to these, there will be Safety and Mission Success and Initial Operational Capability Readiness Reviews. Covered in detail in the SRP, these reviews will be supported by the SRB, GSFC Deputy Director, and NESDIS AA.

#### **4.5.1 Standing Review Board (SRB)**

A GOES-R Standing Review Board is chartered on behalf of the NOAA Program Management Council (PMC) and the GSFC Center Management Council (CMC). The DUS (NOAA Administrator’s Designee) and the Associate Administrator, NASA have authority to determine the scope and the chairmanship of the SRB. The NESDIS AA and GSFC Deputy Center Director approve the membership of the SRB.

The GOES-R SRB will be comprised of experts in both NASA and NOAA systems that are fully independent of the GOES-R Program Office. The SRB is to provide expert technical review of the both segment and end-to-end mission system. Through the planned series of milestone reviews IIRs, the SRB will evaluate the adequacy of the planning, design, and implementation and associated processes to safely and successfully accomplish the mission requirements. The SRB will also assess GOES-R Series programmatic performance and ability to deliver on commitments as baselined by the GOES-R Program Office.

The two co-chairs, accountable to the NOAA PMC, conduct the reviews and report completion of milestone review assessments IIRs to the PMC and GSFC CMC.

## **4.5.2 NOAA Independent Review Team (IRT)**

NOAA will convene an independent life-cycle review after the internal GOES-R Program review is conducted. NOAA will appoint an Independent Review Team (IRT) comprised of senior satellite, ground, and operations acquisition experts to provide an assessment of the technical and programmatic approach, risk posture, and progress against the Program baseline. The IRT will report their findings to the DUS, NESDIS, GSFC CMC and the GOES-R SPD. DOC may request an IRT debrief if desired. The Chairperson will be selected by the Deputy Under Secretary for Oceans and Atmosphere, unless specifically delegated. The scope of review and membership will be coordinated between NOAA and NASA. The Review may not be convened without DUS prior approval. The DUS will also approve the scope and membership of the review in consultation with the NASA Center Director. IRT assessments will be known as IRT Program Status Reviews (I-PSR). I-PSRs will occur after system SCR, before KDP I (formerly known as KDP-C/D), and at NOAA's discretion (up to annually) to assess program status and readiness.

## **4.6 Risk Management Plan**

Risk is characterized by the combination of the probability or likelihood that the program will experience an event and the consequences, impact, or severity of the event, were it to occur. Risk Management (RM) is a continuous, iterative, and proactive process to manage risk and achieve mission success. The process involves identifying, analyzing, planning, tracking, controlling, documenting, and communicating risks effectively. RM begins in the end-to-end Systems Architecture Definition phase and continues through the operations and disposal phase with the disposition and tracking of existing residual and new risks.

The GOES-R SPD will take a proactive approach to managing risk as documented in the GOES-R Risk Management Plan (P417-R-PLN-0081). The GOES-R Program and Projects will adhere to the same Risk Management Plan. The GOES-R RM process will be implemented by the GOES-R SPD and will include the establishment of a Risk Management Board (RMB) chaired by the SPD. Membership of the board is the SMT with the addition of project system engineers. . The Project Managers will establish and chair project level risk boards which will be coordinated with the program level board.

The GOES-R Series program/projects will utilize RM as a decision-making tool to ensure safety and to enable programmatic success. Decisions will be made based on an orderly risk management effort that includes the identification, assessment, mitigation, and disposition of risks throughout the program's life cycle. Applying the RM process also ensures that risk is communicated clearly and consistently to NOAA and NASA management councils

## **4.7 CONOPS (Flight and Ground Operations Plans)**

The Concept of Operations for the GOES-R program is described in detail in the GOES-R CONOPS document P417-R-CONOPS-0008.

## **4.8 Requirements Baseline**

GOES-R Requirements levels are summarized below:

Overall, System and Segment requirements have been separated into two categories – programmatic and technical (Level II/Level IIA and Level III/Level IIIA). This ensures that both mission performance and program/project control and implementation requirements managed comprehensively. The following describes the requirements architecture and interactions among its elements:

### ***Agency Objectives & Goals***

Goals and objectives are provided by NOAA executive management and are documented in the NOAA Consolidated Observational Requirements List (CORL). The CORL is traceable to agency objectives and goals with specific including the following factors: required characteristics of the system (i.e., reliability, performance, maintainability); number of and types of users of the system, and cost/budget estimates, and system need/availability date.

***Level I Requirements***

Mission requirements are derived from the CORL, validated by NOAA Observing System Council (NOSC), and are documented in the GOES-R Level 1 Requirement Document. The Level 1 requirements are managed by the GPO and controlled by the NOSC and DUS.

***Level II Requirements***

Program Control (Level II) Requirements are provided by NOAA to the GPO and are documented in the GOES-R MCP. Level II requirements provide the mission statement, program cost requirements including cost cap, cost management, and scope reduction and also identify budget, schedule, and operational constraints and margins.

System (Level IIA) Requirements are provided by the GPO to the Flight and Ground Segment Projects and are documented in the Mission Requirements Document (MRD) and System Interface Requirements Documents (IRDs). The MRD, flowing down from the Level I requirements, contains high-level requirements for the Space and Ground Segment. Level IIA documents are managed and controlled by the GPO CCB.

***Level III Requirements***

Project Control (Level III) Requirements are provided by the GPO to the GOES-R Flight Project and GOES-R Ground Segment Project and are documented in the GOES-R Project Plans. Level III requirements are managed and controlled by the project CCBs.

Segment/Components (Level IIIA) Requirements define the subsystems that meet the system (Level II) requirements and the interactions between those subsystems. Examples of Level IIIA documents are Inter-Segment Interface Requirements Document (IRD); Segment Functional and Performance Specifications (F&PS) for the flight and ground segments; and Mission Assurance Requirements Documents for each instrument. Level III requirements are managed and controlled by the Flight and Ground Segment Project CCBs. If a Class 1 change (form, fit, function, cost or schedule) violates a Level II requirement, the Flight and/or Ground Segment Project CCB will elevate the change for GPO CCB review, concurrence and direction.

**4.9 Work Breakdown Schedule (WBS) Baseline**

The following figure shows an example of the WBS baseline. The MCP provides a foundation for all planning and execution activities.

WBS Number	Cost Element
1	Total Program
1.1	Flight Project
1.1.1	Spacecraft #1
1.1.2	Spacecraft #2
1.1.5	ABI
1.1.6	SUVI
1.1.7	EXIS
1.1.8	SEISS

1.1.9	GLM
1.1.10	Launch Services
1.1.11	Flight Project Management
1.2	Ground Project
1.2.1	Acquisition & Operations
1.2.2	Antenna
1.2.3	COMM Links
1.2.4	Facility Upgrades
1.2.5	IV&V
1.2.6	NWS
1.2.7	CLASS
1.2.8	OSDPD
1.2.9	Algorithm Development
1.2.10	Transition to Operations
1.2.11	Ground Project Management
1.3	Program Systems Engineering
1.4	Program Office
1.5	PDRR

**Figure 11: Work Breakdown Schedule**

#### **4.10 Schedule Baseline**

The Initial GOES-R Program Master schedule is shown in the following figure.



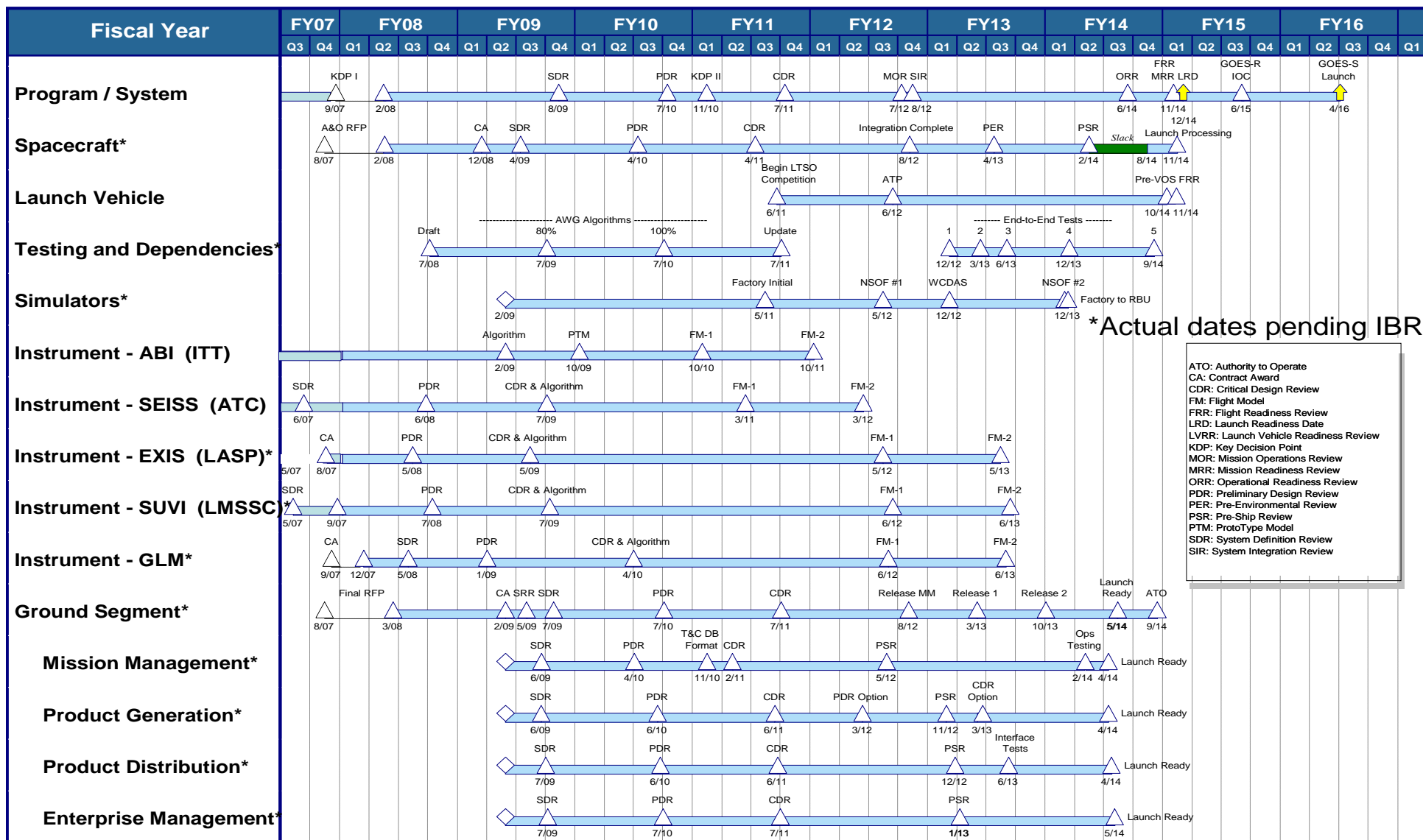


Figure 12: GOES-R Program and Project Schedules

The Baseline Program Master Schedule will be established at KDP II.

#### **4.11 Resource Baseline**

The GOES-R Budget comes from NOAA. A budget strategy, including full cost accounting for NASA GSFC Center Maintenance and Operations (CM&O), has been submitted for FY09 as described in the NOAA/NASA Memorandum of Understanding and was approved by DOC. NOAA utilizes a Planning Programming Budgeting and Execution System to budget and allocate its funding. GOES-R shall submit its budget yearly for incorporation into the overall NESDIS and NOAA budgets. The initial resource baseline will be established at KDP-C/D (KDP-I) and finalized at KDP II. The process used yearly to establish the GOES-R budget for subsequent years is outlined in the Program Control Plans (Section 5) under Financial Systems (Section 5.1).

#### **4.12 Communications Plan**

Communications for the GOES-R program will be coordinated through Program Control.

##### **4.12.1 Legislative Affairs**

GOES-R receives any congressional actions through NOAA and the NESDIS Headquarters. All Legislative affairs will be conducted in accordance with established NESDIS policy as described in the MOU section 6 A 10.

##### **4.12.2 Public Affairs**

NASA and NOAA will coordinate public affairs and will conduct efforts in accordance with existing NESDIS and NASA policies and the MOU.

### **5 PROGRAM CONTROL PLANS**

This section addresses Program Control functions called out in the MOU section 6B6. The GOES-R program and projects are committed to establishing and implementing standard processes and procedures to create uniformity across the program and projects.

#### **5.1 Financial Systems**

GOES-R Financial Management will be conducted as part of the larger NOAA Planning, Programming, Budgeting and Execution System (PPBES). The PPBES links NOAA's strategic vision with programmatic detail, budget development, and annual operating plans. A major decision-making process, the PPBES permits the Line Offices, Goal Team Leads, and programs to do joint planning and link directly to NOAA's Programming, Budgeting and Execution phases. Thus, PPBES permits harmonization of strategy, planning, programming, and budgeting functions. The GOES-R program will follow all NOAA guidance including the procedures outlined in the NOAA PPBES, NOAA Administrative Order (NAO), the Business Operations Manual (BOM), and budget guidance memorandums from the NOAA Chief Financial Officer (CFO).

##### **5.1.1 Planning**

The Planning Phase of PPBES is a 6-month process that begins each March and culminates in an update to the NOAA Strategic Plan, development of an Annual Guidance Memorandum (AGM) to guide the subsequent Programming, Budgeting and Execution phases, and Goal Assessments. Specific details of

the planning process are provided each year from the NOAA Program Planning and Integration Office in its Planning Guidance Memorandum to the programs.

### **5.1.2 Programming**

The Programming phase of the PPBES process provides the fiscal and programmatic linkage between NOAA's strategic plan and its budget. The Office of Strategic Planning (OSP) is responsible for the programming phase of the PPBES process. It aids the GOES-R program office in translating the high level outcomes contained in the NOAA Strategic Plan into clear and understandable program objectives. OSP provides guidance for each year's programming phase in its yearly Programming Phase Overview. The Program Office uses this guidance as it builds its budget for the upcoming cycle.

### **5.1.3 Budgeting**

Budget submissions will occur at least annually to support the GOES-R Program budget formulation and spend plans process.

The GOES-R Program Office will issue annual budget and program guidance (the Annual GOES-R Budget Call) to the Flight and Ground Segment Projects in November of each year to update the projects on the current program of record, to identify any changes in program configuration, to solicit an update to the currently approved funding baseline, and to prescribe the appropriate reporting format. The Flight and Ground Segment Projects will respond with their preliminary submissions in January of the following year and final submissions in March.

The GOES-R Program Office/Program Control and the projects will engage in annual budget discussions in order to support NOAA budget preparation prior to the annual Commerce budgeting process. The Annual Budget and Program Guidance Letter to the Projects will provide the necessary guidance and information to the Project for the development of their budget responses. This guidance and information will consist of:

- Approved Instruments
- Description of the scope of the work being performed by the Project
- Programmatic direction regarding ongoing and future contracts and the exercising of options
- Schedule constraints and launch readiness dates (LRDs)
- Identifies Fiscal Years being considered in the Department of Commerce's submission to the Office of Management and Budget (OMB) and Congress
- Funding constraints and yearly phasing – by fiscal year
- Adjustments to prior years funding
- General instructions for providing a response

The Annual Budget and Program Guidance letter will request a quotation from the Flight and Ground Segment Projects in the format as directed by the GOES-R annual budget and program guidance. The Projects will develop their responses based upon the instructions and guidance provided and knowledge of their contract funding / costing needs, manpower support requirements, and institutional support. The Projects will make every attempt to stay within the funding guidelines. If an over-guidance response is necessary, the Project(s) will document the rationale and provide the documentation within their response to the Program. The Projects will provide an initial submission to the Program in the January timeframe. With the initial submission, the Projects and the Program will engage in discussions so that the Projects' response is fully understood and any changes, if required, can be developed prior to the final submission. The Flight project will ensure that the GSFC Center Director has reviewed the NASA budget submission prior to its final submission to the Program in the March timeframe of each year. The Program Control and the Project Managers will ensure that open dialogue as the GOES-R team assembles, submits and

defends its combined budget. This includes defending program level decisions made to advisory and oversight panels such as the NOAA PMC and the GSFC CMC.

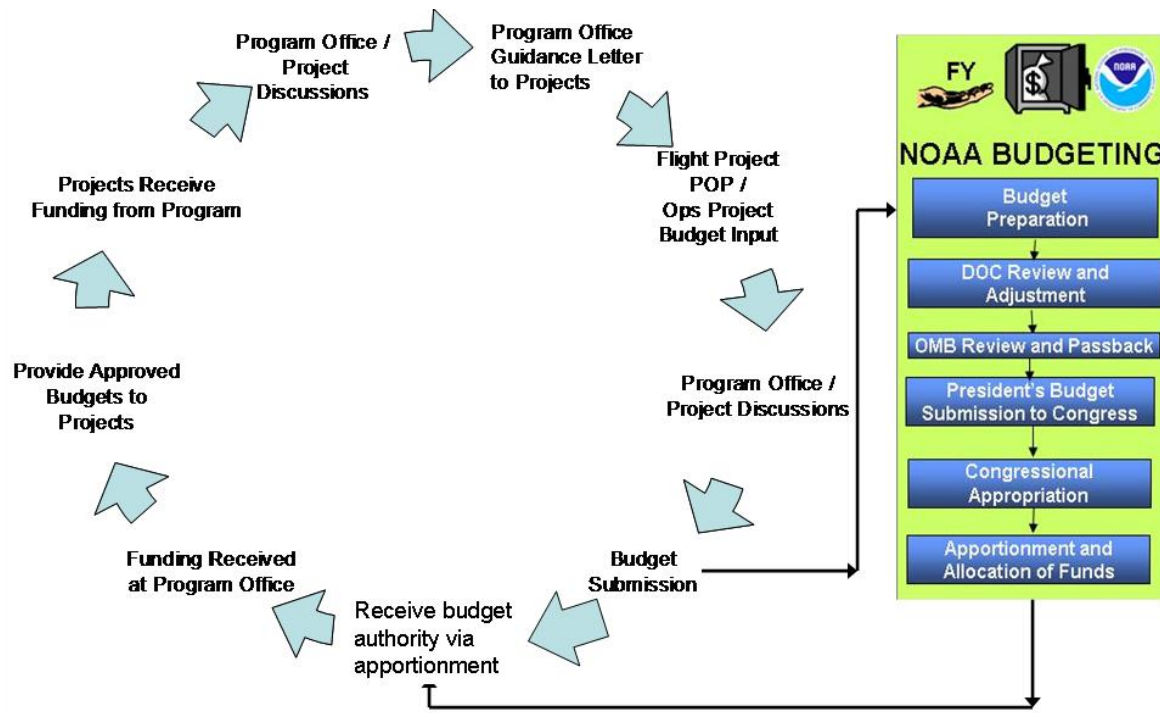


Figure 13- Program Budget Formulation and Review Process Flow and NOAA Budgeting Process

### 5.1.4 Budget Execution and Review

Program Control manages the GOES-R budget execution and review process by initiating, reviewing, or approving a variety of financial documents such as procurement requests and funds transfer requests.

GOES-R Program Control manages the program office budget execution and review processes using financial management policies and procedures per DAO 203-1. In addition, Program Control supports program office planning meetings, contract formulation activities, and contract administration in concert with the Contracting officers. This shall include submission of monthly budget obligation and execution plans and status to the NOAA Budget Office and an annual advanced acquisition plan to the NOAA Acquisition and Grants Office.

Obligation of funds is subject to approved allocations being provided by NESDIS headquarters. Once funds have been provided by NESDIS, the authority for the approval and use of funds resides with the System Program Director (SPD).

Responsibility for the execution of the approved budget resides with the Project leads after coordination from financial execution manager. These responsibilities include the timely identification of funding requirements and coordination with GOES-R Program Control. The GOES-R Program office will provide NESDIS headquarters and NOAA Acquisition and Grants Office (AGO) a plan listing NOAA acquisitions each fiscal year. NESDIS will determine if any individual obligations of NOAA funds require headquarters approval in the acquisition system, the Commerce Standard Acquisition and Reporting System (CSTARS) or equivalent.

GOES-R Program Control reports budget execution status in accordance with monthly obligation plans and monthly earned value reports at the NOAA Program Management Council (PMC). In preparation for the PMC, Program Control analyzes contract cost reports and validates budget requirements. To the maximum extent possible, Program Control must ensure that the funding available for each contract is sufficient to meet all program requirements for all fiscal years.

#### **5.1.4.1 NASA Full Cost Reimbursables**

The GOES-R NOAA-NASA MOU outlines the NASA full cost reimbursables in section 7.

#### **5.1.4.2 Procedures for Funding NASA Total Value of MOU**

The GOES-R NOAA-NASA MOU outlines the procedures for funding NASA total value in section 7.

### **5.2 Performance Measurement Systems**

The Program Control division, led by the Budget Officer, has responsibility for monitoring the performance measurement systems described in the following subsections

#### **5.2.1 Earned Value Management System (EVMS)**

Earned Value Management (EVM) is a project management process that effectively integrates the project's scope of work with schedule and cost elements for optimum project planning and control. The Office of Management and Budget (OMB) requires that federal agencies use EVM for major asset acquisitions, which include major information technology (IT) systems or projects. In addition, OMB requires that EVM must meet the criteria as defined in the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA) Standard 748-2002, *Earned Value Management Systems*, which was revised January 2002.

The contractor(s) will be required to perform the EVM task order technical effort for all major contracts with a value of \$20 million or greater using an ANSI/EIA-748A compliant earned value management system that correlates cost and schedule performance with technical progress. The Contract Data Requirement List (CDRL) includes the Contract Work Breakdown Structure (CWBS) Index and Dictionary, Integrated Baseline review, Integrated Master Schedule and Contract Performance Report. For contracts of \$50 million or greater, a copy of the contractor's ANSI-748A certification and their EVM plan will be submitted with the proposal. In the event that the contractor(s) does not currently have a validated ANSI-748A compliant EVMS, a compliance mitigation action plan and timetable must be submitted with the proposal. The Government must approve the compliance plan and timetable within a period of time soon after final award. In addition, it may be required at the Government's discretion, that appropriate deliverables and checkpoints will be added to the project schedule to ensure eventual compliance certification during the project period of performance.

Contractors with contract values of \$20 million or greater must ensure that all funds provided to its subcontractors comply with the intent of the Project Management Reporting requirements and report their data accurately and in time for inclusion in each of the Project Management Reporting deliverables. It is the contractor's responsibility to perform EVM oversight and review of its primary subcontractors.

#### **Contract Work Breakdown Structure (CWBS)**

Upon contract award, the contractor(s) should provide a CWBS that is consistent with ANSI/EIA-748A guidelines. The CWBS should reflect the project scope minus any government activities and costs. The CWBS should then be presented to the Government Project Manager, who will review and identify needed government resources and direct and indirect costs.

## **Integrated Master Schedule (IMS)**

Within sixty days of contract award or letter task order issuance, the contractor(s) shall deliver the preliminary baseline and project schedule. The IMS project schedule shall be in strict compliance with the CWBS. It is critical that all tasks supporting a single deliverable or work product, regardless of the owner/supplier of each task, are organized together and roll up to a single CWBS element and summary level task in the project schedule. The IMS should be aligned with the CWBS and reconciled with the Contract Performance Report. The IMS should contain schedule risk analysis and reflect contract milestones and technical requirements. The master schedule and lower level schedules must provide vertical and horizontal traceability.

## **Contract Performance Report (CPR)**

The contractor(s) shall prepare and submit a monthly Contract Performance Report (CPR). The CPR shall be in strict compliance with the CWBS. It is critical that all tasks supporting a single deliverable or work product, regardless of the owner/supplier of each task, are organized together and roll up to a single CWBS element and summary level task in the project schedule. Contract Performance Reports should consist of all the following 5 formats.

- Format 1 - Work Breakdown Structure
- Format 2 – Organizational Categories
- Format 3 – Baseline
- Format 4 – Staffing
- Format 5 – Explanation and Problem Analysis

The contractor(s) shall include all budget amounts whether allocated or not in the reported EVM data and load such data into all required formats of the CPR to ensure its validity before transmitting it to the central GOES-R Program Portal Repository. Government point of contacts (POCs) will be responsible for reporting data and their analysis to the NOAA Program Manager or designee on a monthly basis. At minimum, CPR data must be reported at Work Breakdown Structure (WBS) level three, and if requested by the Government at any point in time, down to the lowest level of where EVM data is being collected (typically the work package level or the level to where actual costs are being charged to).

The contractor(s) shall only adjust cost performance data; Budgeted Cost of Work Scheduled (BCWS), Budgeted Cost of Work Performed (BCWP) and Actual Cost of Work Performed (ACWP) from prior months with written direction from the Government Project Manager or designee. Baseline adjustments for errors, accounting adjustments or approved re-baseline actions shall be recorded in the current reporting month. This applies only to definitized baselines using the existing EV Tool.

The GOES-R Program will use the current month and cumulative BCWS, BCWP and ACWP to calculate the current month and cumulative Cost and Schedule Variances (CV and SV). In addition, GOES-R will use the Cost and Schedule Performance Indexes (CPI and SPI) as primary measures of major system component cost and schedule efficiency. Variances and performance indices; CV, SV, CPI and SPI are defined as:

$$\begin{aligned} \mathbf{SV} &= \mathbf{BCWP - BCWS} \\ \mathbf{CV} &= \mathbf{BCWP - ACWP} \\ \mathbf{CPI} &= \mathbf{BCWP / ACWP} \\ \mathbf{SPI} &= \mathbf{BCWP / BCWS} \end{aligned}$$

A CPI or SPI of 1.00 indicates 100% performance for budget and schedule. CPI/SPI greater than 1.00 indicates performance that is ahead of schedule or below cost where as a CPI/SPI less than 1.00 indicates performance behind schedule or above cost.

<b>Index</b>	<b>Green</b>	<b>Yellow</b>	<b>Red</b>
CPI	CPI>0.95	0.95> CPI > 0.90	CPI< 0.90
SPI	SPI>0.95	0.95> SPI > 0.90	SPI< 0.90

**Figure 14: EVM Indices Thresholds**

Any index change resulting in a “red” assessment must be reported to the Program Office immediately, whereas an index change resulting in a “yellow” assessment will be reported at the next month’s review. This applies to both the current month and the cumulative indices. EVM indices will be reported at the monthly status review to the GSFC Center Management Council (CMC) and NOAA Program Management Council (PMC). The program office shall work with the Projects to determine corrective action required. Any major component index which falls into the red zone requires immediate notification of the Program Office. The color coded index system will only be reported internally to the program where as any variances outside of the 10 % threshold will be reported externally to NESDIS, NOAA, and the Department level as required.

**Integrated Baseline Review (IBR)**

An IBR is a joint assessment conducted by the Government Program Manager (PM) and the contractor(s) to verify the realism and accuracy of the Performance Measurement Baseline (PMB). This involves verifying the technical content of the baseline and assessing the realism and accuracy of the related resources (performance budget and Integrated Master Schedule (IMS)). The IBR is unlike the Validation Review (VR) that focuses on EVMS compliance with ANSI/EIA-748A. Instead the IBR focuses on assessing the realism of the baseline.

The contractor(s) and Government shall support the formal IBR as early as practicable and should be initiated no later than 180 calendar days after contract award/Authority to Proceed (ATP), the exercise of significant contract options and the incorporation of major modifications or as otherwise agreed upon. In addition, the Government will request to conduct a Pre-IBR sixty days prior to the formal IBR date.

The IBR should not be considered as a one-time event or single point review. IBRs are also performed at the discretion of the PM or when major events occur within the life of a program. These events may be a significant shift in content and/or time-phasing of the PMB or a major milestone. An IBR should also be conducted whenever an Over Target Baseline (OTB) or Over Target Schedule (OTS) is implemented.

The IBR should prepare risk evaluation criteria in technical, schedule, cost, resource and management processes. Technical risk is the ability of the project’s technical plan to achieve the objectives of the scope of work. Schedule risk is the adequacy of the time allocated for performing the defined tasks to successfully achieve the project schedule objectives. Cost risk is the ability of the PMB to successfully execute the project and attain cost objectives, recognizing the relationships between budget, resources, funding, schedule, and scope of work. Resource risk is the timely availability of personnel, facilities, and equipment to perform the defined tasks needed to execute the program successfully. Management processes risk is the degree to which the management processes provide effective and integrated technical/schedule/cost planning and baseline change control.

The Government and contractor(s) will begin discussing the coverage of the IBR as soon as possible after contract award. The IBR focuses on assessing the baseline realism at the lowest level and other baseline related risk evaluations as necessary. Sixty days prior to the IBR (in conjunction with the Pre-IBR), the contractor(s) shall be required to provide all supporting and preparatory documentation to the

Government for their review. The importance of the Pre-IBR and submittal of documentation is to provide the Government with ample time to review all data related to the IBR and allow the Government time to formulate questions related to what will be presented. In addition, it allows both contractor(s) and Government to construct the IBR teams and provide any IBR training necessary. This documentation shall include, but not limited to; Basis of Estimates (BOEs), WBS Dictionary, Work Authorization Documents (WADs), Responsibility Assignment Matrix (RAM), Control Account Plan (CAP) (which includes the baselined schedule and all things associated with it such as time phased costs, the Resource Breakdown Structure (RBS) per tasks, detailed breakdown of WADs, basis of EV status and reporting etc...), CPR to date and a Risk and Impact Analysis. The WBS level at which the Government requires the contractor(s) to present its data will be the lowest level that the baselined schedule is resourced and where actual costs are collected. During the IBR, the Government will jointly assess the adequacy of the above documentation with the contractor(s).

It is sometimes necessary to perform re-planning actions that are within the scope of the authorized contract that will result in improvement in the quality of the program management information being generated by the earned value system. However, the master project schedule and the time-phased performance measurement baselines may be changed only with the approval of the Government Project Manager or designee. The request for either internal (contractor(s) controlled) or Government-approved re-planning must be accompanied by the Program Control Log indicating reason for requesting the changes.

### **Government Oversight and Assistance**

EVM specialists will be matrixed from the Program Office to the Projects to ensure a consistent approach to earned value. The Program Office will also provide support as well as the detailed review and analysis of the entire GOES-R Earned Value Management System process including: the critique of the entire project's CWBS and Project Schedule, the assistance and guidance to conduct and perform the required IBR sessions with all appropriate parties, assist NOAA with all baseline reporting and control functions, as well as continuing the ongoing synthesis and development of NOAA's EVM policy, procedures and requirements. In addition, projects shall provide detailed EVM assessments to the program as part of monthly GOES-R Program Management Reviews (PMRs) and summary assessments will be included in NASA Center Management Council and NOAA Program Management Council (PMC) monthly reports and presentations. NESDIS Headquarters will also conduct additional EV monitoring and oversight by accessing and reviewing source EV data and providing an independent review and feedback to the Program Office and NESDIS leadership on any anomalies or concerns. The NESDIS Headquarters EV staffs are located in the NESDIS OCFO Program Planning and Analysis Division. Questions regarding anomalies or concerns identified through NESDIS Headquarters monitoring will be promptly and sufficiently addressed by the Program Office. NESDIS Headquarters will elevate significant issues to NOAA as appropriate.

Additional Government Oversight includes the following:

EVM System Surveillance (system IAW ANSi/EIA-STD-748) compliance

Contractor Performance Measurement Data includes schedule, earned value, cost performance, Budget at Completion, and Latest Revised Estimate.

Acquisition Program Baseline (APB)

Thresholds and objectives for cost, schedule and performance

Deviation reports required if breach has or will occur



APB for major program reported in Selected Acquisition Report (SAR)

SAR annually and quarterly

Unit Cost Report

Cost breaches triggered by 15% growth in current or 30% growth in original Program Acquisition Unit (PAUC) or Average Procurement Unit Cost (APUC)

## **NOAA Reporting**

In addition to the monthly PMRs, status reports and presentations, the GOES-R GPO is required to submit quarterly EVM Reports and annual Operational Analyses Reports to NOAA. The project performance reports are to include an integrated performance curve graph that depicts the following cumulative variances:

- BCWS or Planned Value (PV)
- ACWP or Actual Cost (AC)
- BCWP or Earned Value (EV)

Project performance reports will also include the following cumulative EVMS data:

- Budget at Completion (BAC)
- CV
- CPI
- Estimate at Completion, adjusted for the current CPI; (EAC1)
- Variance at Completion, adjusted for the current CPI; (VAC1)
- Estimate to Complete, adjusted for the current CPI; (ETC1)
- SV
- SPI
- Cost/Schedule Index (CSI)
- Estimate at Completion, adjusted for both CPI & SPI (EAC2)
- Variance at Completion, adjusted for both CPI & SPI
- Estimate to Complete, adjusted for both CPI & SPI
- Expected Completion Date, based on the current SPI
- Level of Effort
- Cost Performance Index Chart
- Cost/Schedule Variance Trends Chart
- Estimate at Completion (EAC) Chart
- Use of Management Reserve (MR) PMB Plot
- Use of MR Cost variance Chart
- MR EAC Chart
- Over Target Baseline PMB EAC Chart
- Effect of Over Target Baseline on CV Chart
- Six Period Summary
- Executive Summary

Along with the quantitative data listed above, the project performance report shall include a discussion of any cost or schedule variances exceeding 10% (a CPI, SPI or CSI less than 0.90 or greater than 1.10). This discussion will explain the cause(s) of the variance and whether or not the project still expects to achieve its performance goals. The report will also discuss the corrective actions that will be taken to

correct the variances, the risk associated with the actions and how close the planned actions will bring the investment to the original baseline and explain any anticipated need for baseline changes, if any.

Performance reports must be submitted, in either WordPerfect or Microsoft Word, in the required format. The reports are due by April 15, July 15, October 15 and January 15 of each year and are to reflect performance through the end of the previous month.

Annual Operational Analyses, separate from those included in the Operational IT Plan, will focus on four performance criteria:

- Financial performance
- Customer results
- Business and strategic results
- Innovation

Operational Analyses are due annually by February 15 and are to focus on each investment's operational state as of December 31 of the previous year.

## **5.2.2 Contingency, Schedule Margin and Baseline Controls**

### **5.2.2.1 Contingency**

GOES-R project managers and Program Systems Engineering will request a budget that includes contingency funding using the budget execution process outlined in section 5.1.3. The SPD will approve the project budget, including contingency level. Once allocated, the project manager and PSE have the authority to reallocate and apply contingency as appropriate across project elements.

The GOES-R Program should maintain a budget reserve level of 10% through A&O phase. Flight Project should maintain a budget reserve level of 20% on unliened cost to go or higher through the last spacecraft delivery. At the time of delivery of the final spacecraft to the delivery to the launch site, flight projects should have a budget reserves level of 10% or higher. Ground Segment Project should maintain 30% or higher through FOC for operations. Deviations from this level of budget reserves shall require concurrence of the SPD, CMC and NOAA.

The Project Manager has the authority to approve an over target baseline within the budget, milestone and Level II performance parameters called out in this plan. Project Managers will inform the SPD prior to any such rebaselining activities. In the event that the contingency is projected to reach 10% during A&O, the program may remove that authority until such time that healthy contingency is restored.

At monthly status reviews, project managers shall present their budget reserves status relative to approved levels. If the budget reserves fall below the agreed-to levels, the presentations shall include justification for the shortfall and a mitigation strategy. Project Managers must maintain contingency of 20% unliened cost to go.

### **5.2.2.2 Schedule Margin and Baseline Control**

#### **5.2.2.2.1 Schedule Margin**

Schedule margin guidelines are specified for the Flight Project from Goddard Interim Directive (GID 7120.1 schedule margins and budget reserves to be used in planning flight projects and in tracking their performance).

Schedule margin guidelines for the Ground Segment Project are:

- From ATP to segment factory Integration & Test (I&T): One month per year
- From segment factory I & T through launch minus six months: two months per year
- From launch minus six months to launch minus one week: One and a half months total
- From launch to Operational Readiness Review : One month total

Schedule margins less than those specified may be appropriate in some cases. There may be circumstances where schedule margins greater than those specified will be required. Any deviations between the actual and recommended schedule margins shall be agreed upon between the SPD and the respective project managers and require concurrence of the CMC and NESDIS.

At monthly status reviews, project managers shall present their schedule margin status relative to the approved margins. If the schedule margin falls below the agreed-to levels, the presentations shall include explanations as to the reasons for the shortfall as well as a description of any activities initiated to mitigate the trend.

#### **5.2.2.2.2 Schedule Baseline Control**

The GOES-R Program and Projects will develop, maintain, and execute integrated master schedules and institute schedule management processes that:

- Provide a controlled schedule baseline, encompassing all elements of the program/project WBS
- Provide regular schedule performance measurement against the baseline, and current forecast-to-complete
- Provide hierarchical traceability from the detailed schedules to the highest level milestones which are controlled by the GPO
- Identify critical path for management and control
- Contain all critical milestones for internal and external activities
- Provide schedule integration and traceability based on an end-to-end logic network format that relates all tasks and milestone dependencies from the project start to completion
- Identify and control schedule reserve based on project risk and report monthly.

Project Managers may augment the Critical Milestones (CM) that encompass the schedule baseline with additional milestones in the Program Master Schedule (MS) or Project Master Schedule (PMS) which highlight key events within project elements. These supporting milestones could include such events as: payload or spacecraft design reviews and deliveries, achievement of Technology Readiness Levels (TRL), or finalization of memorandums of understanding.

The schedule baseline will be documented and controlled in the Master Schedule. The initial Program and Project milestone schedules have been established. Milestones appearing on the Program Master Schedule will be baselined and controlled as noted in the table below:

Milestone Type	Key Milestones	Critical Milestones	Program Milestones	Project Milestones
Rebaseline Approval Level	DUS	NESDIS	GOES-R SPD	Project Manager
Notification Level	DOC	DUS	NESDIS	SPD
Baseline Date	KDP I (DOC KDP C/D)	KDP II	KDP II	Initial Baseline Review
	KDP II Satellite ship Ground Block Delivery #1 Mission Readiness Review Launch Readiness Date IOC – capable of delivering cloud and water vapor imagery FOC – capable of delivering cloud and water vapor imagery from both east and west stations	System SDR System PDR System CDR System Integration Readiness Flight Storage Readiness	Initial ground System Delivery Instrument Delivery Mission Ops Readiness Flight Ops Readiness Interface Milestones Spacecraft and Ground Contract Award Ground Block Deliveries #2, #3, #4	Instrument design reviews Spacecraft bus design review milestones Ground segment design review milestones Instrument Contract Award Spacecraft and Ground RFP release dates

**Figure 15: Description of Milestones in the GOES-R Program**

Milestones are baselined as noted in the table above. Baselined Program Master Schedule and Project Master Schedules will be maintained under formal configuration control. Schedules change, and the table above summarizes approval levels needed to change dates for program and project milestones.

Projects may develop an internal schedule replan. An internal schedule replan is defined as a restructuring of the Level III schedule where all project requirements and scope remain the same, Program Level milestones are unaffected, schedule reserves are not reduced and the cost of the “to go” effort remains within project operating plan guidelines.

If a baseline identified in the Program Master Schedule is no longer achievable a schedule “rebaseline” can be requested and approved at the levels defined below. If an individual milestone is projected to slip 3 months or greater from the baseline dates established at IBR, notification of the appropriate level is required. Individual milestones delays with the potential to affect the program critical path will be reported regardless of the length of the schedule slip.

System integration is defined as the integration of flight and ground systems for observatory level end to end testing. Interface milestones are outlined in the Program Master Schedule.

### **5.2.3 Programmatic Thresholds**

The GOES-R Risk Management Plan outlines specific thresholds for cost, schedule, and technical risk reporting.

Thresholds for the cost impact for a particular segment are based upon projected percentage overrun for that segment in combination with the availability of prudent cost reserves. Total cost risk is determined by a combination of impact and probability of occurrence.

At the project level, GOES-R follows the Goddard Space Flight Center guidelines for healthy contingency (20% contingency on unliened cost-to-go). This metric is tracked monthly by the program office. Similarly, schedule risk is based on the critical path and schedule contingency health.

Risk thresholds are designed to communicate cost and schedule risk and mitigations far in advance of impacting budget and schedule control thresholds outlined in the Level I Requirements.

### **5.2.4 Technical Thresholds**

The Program Systems Engineering Lead will identify system level metrics to monitor and track. Each Project Systems Engineering Lead is responsible for identifying and managing the mission resources allocated for their respective system and subsystem segment. Each Project Systems Engineering Lead and Program Systems Engineering Lead will identify resources that need to be monitored.

The Program Systems Engineering Lead defines acceptable resource margins and establishes a margin management philosophy based on various stages of the mission lifecycle. As the system architecture matures, the precision of the resource estimates will improve, as will the method of estimating the resources requirement. Resource margins shall be met in accordance with GSFC-STD-1000. Both the Flight Project and Ground Segment Project will track technical resource margins at their level and report margin status to the program.

## **5.3 Oversight and Reporting**

The major reporting bodies for GOES-R are summarized in the figure below:

<b>Type of Reporting</b>	<b>Dates Scheduled</b>	<b>Reviewer</b>
Senior Management Team (SMT) Weekly	Weekly	SPD or designee
GOES-R Personnel Management Group	Monthly	DSPD
GOES-R Engineering Review Board	As required	PSE or designee
GOES-R Monthly Program Review	Monthly	SPD or designee
NOAA Program Management Council (PMC)	Monthly	DUS/NOAA PMC
NASA GSFC Monthly Status Review (MSR)	Monthly	Deputy Center Director / GSFC Center Management Council (CMC)
NASA GSFC Pre-MSR	Monthly	GSFC Director of Flight Projects
DOC Quarterly Program Review	Quarterly	DOC CFO/ASA
NOAA and NASA Administrator meeting to assess Program status and progress	Yearly or as necessary	NOAA Administrator NASA Administrator
NOAA/NESDIS Independent Review Team	As required	DUS/NESDIS designated
Standing Review Board	As required	NESDIS/GSFC designated
KDP-I Readiness Review	Prior to Spacecraft RFP release	NOAA PMC
CITRB	Prior to Ground Segment Procurement release	CITRB members
NITRB	Prior to ground segment procurement release	NOAA CIO Council
NESDIS Weekly Program Tag Up	Weekly	NESDIS DAAS
Program Monthly Status Report	Monthly	OMB
GSFC/NESDIS Tag Up	Monthly	NESDIS AA, GSFC Deputy Center Director, Technical
NESDIS Monthly Status	Monthly	NESDIS AA
Project Monthly Status Review	Monthly	Project Manager, SPD attends
Review of Award Fee Effectiveness	Annual	NOAA/NASA Findings reported to DOC

**Figure 16: Summary of GOES-R Meetings**

### **5.3.1 NOAA/NASA Administrators Meeting**

MOU section 6A1 identifies a requirement for the Administrators of NOAA and NASA to meet at least annually and on an as needed basis to assess the status and progress of the GOES-R program. The Office of the NOAA Administrator will prepare guidance for NESDIS and the program office to identify meeting time, place, and areas of interest.

### **5.3.2 Commerce Department Level Reporting**

GOES-R will report to the Department of Commerce:

- DOC Quarterly Review
- Program Monthly Status Reports (provided to OMB)
- Annual NOAA budget review

A description of each method is summarized below.

#### **5.3.2.1 DOC Quarterly Review**

Quarterly, the SPD will brief the DOC Chief Financial Officer/Assistant Secretary for Administration (ASA/CFO) on the progress of the GOES-R program.

#### **5.3.2.2 Program Monthly Status Reports**

Each month GOES-R reports status to the Office of Management and Budget through NOAA and DOC. These reports follow the format provided by OMB.

#### **5.3.2.3 Annual NOAA Budget Review**

Annually, GOES-R participates in the annual NOAA budget review which is incorporated into the DOC budget submission.

GOES-R will provide acquisition reviews as directed by the Department of Commerce.

### **5.3.3 NOAA Level Reporting**

NESDIS AA provides a:

- Weekly summary of GOES R program activities to the NOAA DUS
- Monthly summary of GOES R program activities to the NOAA US
- Weekly “items of interest” summary for discussion between DUS/US and ASA/CFO/Deputy Secretary DOC

In addition, NOAA has two oversight councils that periodically review the GOES-R program:

- Program Management Council (PMC)
- NOAA Information Technology Review Board (NITRB)

A description of each council is included below.

#### **5.3.3.1 Program Management Council (PMC)**

The NOAA Program Management Council, chaired by the DUS, is the *program oversight* body for the GOES-R program. Program/Acquisition oversight responsibilities include, but are not limited to:

- Oversees NOAA acquisition policies and practices to ensure implementation and compliance with related Departmental and OMB policies
- Ensures the overall quality, responsiveness, and effectiveness of the major system acquisition process, including approving the readiness of individual system acquisitions to proceed for Secretarial review and action

The SPD, Flight Project and Ground Segment Project Managers brief the PMC.

### **5.3.3.2 NOAA IT Review Board (NITRB)**

The NOAA IT Review Board conducts a technical evaluation of IT budget submission proposals for programs within NOAA, in support of the annual budget process managed by the NOAA CFO. NITRB approval is required before submission to the CITRB for Delegation of Procurement Authority (DPA)

### **5.3.4 NESDIS Reporting Requirements**

NESDIS DAAS reviews the status of GOES R each week with the SPD.

NESDIS CFO has access to project and program financial data, including EVM for review and assessment. NESDIS CFO will provide regular audits of GOES-R financial health and review monthly financial data.

Weekly Status reports from GOES R SPD are provided to NESDIS AA, DAA, and DAAS

Each month, prior to PMC, the NESDIS AA and GSFC Deputy Director, Technical discuss NOAA program/project status and develop plans for mitigating any risks or issues identified.

### **5.3.5 NASA Reporting Requirements**

The GSFC Deputy Director chairs the GSFC Center Management Council (CMC) to conduct Monthly Status Reviews (MSRs) to assess the status of each of the programs, projects and instruments assigned to the Center. GOES-R Program and Projects will report to the CMC. Reports include; preparing and presenting the MSR briefings, as well as highlighting significant items of progress, issues, risks, metrics, and trends. These briefings include identification and closure of open issues and options for resolving variances in baseline cost, schedule, and technical metrics. MSR process is described in GPR 1060.2C - Management Review and reporting of Programs and Projects.

NOAA will have a seat on the CMC. Typically, DAAS and/or Director OSD attend.

A Pre-MSR is prepared with the same material for presentation to the GSFC Flight Programs and Projects Directorate (Code 400). SPD/DSPD attends these pre-briefs. Associated material is presented in more detail to the GPO as part of the Monthly Program Review (noted above).

Project Managers provide Weekly Status Reports to Flight Programs and Projects Directorate.

### **5.3.6 GOES-R Series Program Office (GPO)**

The GOES-R Series Program Office (GPO) is responsible for technology and programmatic planning, systems engineering, pre-acquisition, acquisition development, Operations and Maintenance (O&M), decommissioning, and disposal of the GOES-R system. The GPO oversight functions include:



**Functional Tag Ups** - Weekly program tag ups will occur for each GOES-R functional group and senior staff. The tag up is designed to be a concise and informal forum to communicate activities and issues for the week.

**Senior Management Team (SMT) Weekly** - The SMT is a weekly status review and decision-making meeting. The SMT covers five main topic areas:

- Program Status
- CCB decisions
- Risk items
- Budget Review
- Ad hoc topics

The SMT enables program-wide communication and coordination. Program Control facilitates the SMT, recording the minutes and tracks actions. SPD or DSPD chairs this meeting.

**Personnel Management Group** – Program Control, SPD/DPSD, and NOAA Human Resources meet at least monthly to discuss status of current or planned personnel actions

**Monthly Program Review (MPR)** - Each GOES-R functional group (i.e. project or division activity) is responsible for presenting the status of their activities at the GOES-R Monthly Program Review (MPR). Major papers, briefs, acquisitions, developments and operational activities are reviewed monthly. The information to be represented includes schedule data, cost data, earned value information, risks and issues and technical program

Project Status Reviews – SPD or delegate attends the monthly project status review, a detailed discussion of project activities and issues.

Weekly Status Reports – project managers provide weekly activity reports to SPD

## **5.4 Calendar**

The GPO and the GOES Program office have implemented MS Outlook as the primary tool for scheduling meetings and conferences. This tool has been installed on the desktop of all GOES-R personnel and is accessible via the web site portal. Additionally, the Project and Systems Engineering calendars are published and posted daily in MS Outlook to facilitate collaborative scheduling with personal schedules as well as provide announcements.

## **5.5 Property**

The Property Management process complies with federal regulations and appropriate agency property and logistics management directives and instructions. NOAA Property Management is conducted in accordance with the NESDIS Interagency and Other Special Agreements Manual, Appendix on Control of Government Owned Property. The NASA Property Management process complies with federal regulations and NASA property and logistics management directives and instructions. This section provides details called out in the MOU section 9, Control of Government Owned Property.

### **5.5.1 Control of Government Owned Property Process Description**

This section documents the areas of property administration that will be accomplished by GSFC property managers and GOES-R/NESDIS property managers.

This direction addresses all equipment that was purchased and/or provided by GOES-R/NESDIS for a contractor (Government-Furnished Equipment (GFE)). It also addresses all property purchased by a contractor at the direction of GSFC (Contractor Acquired Property (CAP)) that is retained as government-owned equipment by GOES-R/NESDIS.

### **5.5.1.1 GSFC Responsibilities**

The GSFC responsibilities for the GOES-R Program include the following:

- Manage property at GSFC that is purchased with GOES-R funding for use by NASA or its support contractors in accordance with all applicable Federal Acquisition Regulations (FAR) and the NASA FAR Supplement (NFS)
- Provide an annual inventory of all property at GSFC that is purchased with GOES-R funding for use by NASA or its support contractors. The inventory should include all mandatory element fields required to maintain the NOAA Property system. These fields are:
  - The Federal Supply Class
  - Property Identification Number
  - Manufacturer and model number
  - How it's acquired (e.g., constructed, purchased, transferred)
  - From whom acquired
  - Acquisition cost
  - Acquisition date
  - Physical location.
  - Identify whether it is GFE or CAP
  - Optional fields include:
    - Model name
    - Source document number (purchase order, contract)
    - Serial number
- Ensure that all applicable proper property clauses from the FAR and NFS are incorporated into any NASA GOES-R contract.
- Ensure that each NASA GOES-R contractor provides the annual NASA Form 1018, Financial Reporting of NASA Property in the Custody of Contractors and that a copy is provided to the NESDIS Program Office.
- Provide a list of any such property to the GOES-R Program Property Manager prior to any disposition of such property

### **5.5.1.2 GOES-R/NESDIS Responsibilities:**

The NESDIS responsibilities for the GOES-R Program include the following:

Notify GSFC property management organization of any property on the Inventory Schedule list of which they may want to take possession and provide shipping instructions.

GOES-R/NESDIS may take possession of their property at any time under any circumstance, except that NASA shall have the opportunity to transfer data from computers prior to such action.

-

- Inform GSFC property management organization of any NOAA regulatory changes that may have an impact on property controls
- Include the following mandatory internal data before inventory reports are sent to the NOAA Regional Property Manager for review: CBS ACCS, Property Accountability Officer, Property Custodial area, and Property Custodian
- Record all property related to this project in the NOAA Personal Property System
- Retain copies of all NOAA contract close out documents

- Retain copies of the Inventory Report to the GOES-R/NESDIS for all NOAA Government-Furnished Equipment and all NOAA Contractor- Acquired Property purchased with GOES-R/NESDIS funds
- Ensure that proper disposal procedures are followed in accordance with the FAR

## **5.6 Waiver Approval Authority**

Waivers to the GOES-R MCP may be granted with the approval of both the NESDIS AA and the GSFC Center Director. In case the NESDIS AA and GSFC Director disagree on waiver approval, the request may be elevated to the Deputy Under Secretary for Oceans and Atmosphere.

## **6 SYSTEMS ENGINEERING MANAGEMENT**

The GOES-R Program Systems Engineering Management Plan (SEMP) P417-R-PLN-0025 defines the technical approach to managing and executing mission systems engineering throughout the life cycle of the GOES-R program. This represents the full end-to-end system – from capture of energy irradiating on the space borne instruments to final product distribution. In addition to the Program SEMP, the Flight Project and Ground Segment Project have developed SEMPs to cover their respective Systems Engineering segment responsibilities.

The GOES-R systems engineering team is staffed with both NASA and NOAA personnel with institutional system engineering oversight provided by the Applied Engineering and Technology Directorate, GSFC. As NESDIS builds its own competencies and capabilities for systems engineering, this oversight will transition to NESDIS.

The GOES-R End-to-End System will become a seamless integration of the Space Segment and the Ground Segment, which will generate and distribute products to the end users and to the NOAA archive and retrieval system, CLASS. GOES-R is a system which is being provided by multiple contractors. Most interfaces between the major subsystems as well as with the Users are bi-directional and interactive. The system must ensure that these sub-systems work together while meeting the stringent performance and reliability requirements. The Program Systems Engineering Office (PSEO) has been established to ensure these interfaces are properly designed and implemented. Further, a series of “end-to-end” tests will be conducted as the system is integrated to ensure that all operational and contingency modes perform and meet the Mission Requirements. Actual flight and operational ground system hardware and software will be used for much of this testing. Independent analysis of the designs and relevant special tests will be performed when functional and performance testing is not feasible. System level testing activities will extend through the launch and checkout of the first satellite to ensure the system operates reliably and as efficiently as possible.

### **6.1 Requirements Management**

The NOAA Executive Panel and NOAA Executive Council have delegated approval authority to the Deputy Under Secretary for the user requirements or Level I requirements, which are the basis for the GOES-R series system acquisition.

The NOAA Observing System Council is the program requirements validation body. The NOSC, along with the NOAA PMC are the advisory bodies to the Under Secretary for NOAA's Earth observation and environmental observation-related data management (end-to-end collection, processing, storage, archiving, accessing, and disseminating) activities.

The GOES-R Requirements Management Process is the process by which user requirements for environmental data from geostationary satellites and ground processing systems are generated. The requirements are translated into more detailed system specifications and are assessed for impacts.

### 6.1.1 Requirements Hierarchy

The GPO has designated four levels of requirements. The figure below provides the hierarchy and examples of the four levels of requirement documents.

Requirement Level	Baseline Document	Document Custodian & Control Process	Reviewing Body	Approving Body
<b>NOAA Observing Systems Architecture (NOSA)</b>	Consolidated Observational Requirements List (CORL)	NOAA Observing Systems Council (NOSC)	NOSC	NOAA Executive Council (NEC)
<b>Level I</b>	GOES-R Level I Requirements Documents	Final: GOES-R Program Office (GPO)	NOSC, NOAA PMC, NESDIS AA/DAA	NOAA DUS
<b>Level II</b>	GOES-R Management Control Plan	GPO	NESDIS AA/DAA NASA/GSFC PMC	NESDIS AA, NASA/GSFC Center Director
<b>Level IIa</b>	Mission Requirements Document	GPO	GPO GORWG	GOES-R SPD
<b>Level III</b>	GOES-R Project Plans	GOES-R Projects	GPO	GOES-R SPD
<b>Level IIIa</b>	Project Level Interface Documents and Functional Specifications	GOES-R Projects	GPO	GOES-R Project Managers

**Figure 17 – GOES-R Requirements Documents Hierarchy**

All GOES-R requirements are derived from the NOAA Consolidated Observation Requirements List (CORL), which documents and prioritizes observational requirements across all NOAA Programs. The NOAA Observing Systems Council coordinates annual updates of the CORL and performs two functions:

- Allocation of user identified observing requirements to the appropriate NOAA observing system program office
- Verification that the observing systems are consistent with NOAA’s existing and planned Observing Systems Architecture

GOES-R Level I Requirements, documented in the GOES-R LIRD (P417-R-L1RD-0137) are the user/science requirements that are allocated to the GOES-R program.

The Level I requirements serve as the supervisory documents for the GOES-R program. All subsequent documents flow down from the Level I documents. .

At Level II, the MCP outlines management processes required to execute programmatic responsibilities. Requirements from the MCP are used to create and execute project plans at Level III. The Program level technical Mission Requirements Document (MRD P417-R-MRD-0070) translates Level I requirements into Level IIa requirements used to acquire the GOES-R Series System. The MRD is the primary requirements document for the system PDRR and A&O contracts.

At Level III, The MRD is used to create Level IIIa requirements, which are subsystem and interface level requirements documents. They are maintained and controlled by the Flight and Ground Segment Projects. Level IIIa requirements documents become contractual documents provided to development contractors for the GOES-R system.

At Level IV, Level IIIa requirements are used to create Level IV requirements by the development contractors. Level IV requirements become the contractor's system and subsystem specifications for the design, development, and testing of the GOES-R systems and subsystems.

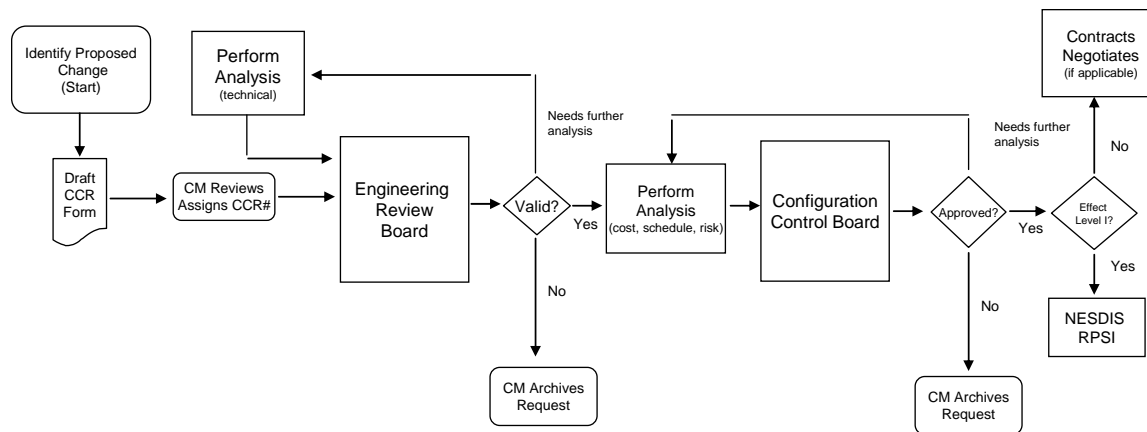
## **7 DOCUMENT AND CONFIGURATION MANAGEMENT**

### **7.1 Configuration Management (CM)**

The Configuration Management (CM) process is the disciplined approach used to control the baseline by imposing requirements for configuration identification, change control, status accounting, and audits. Program/Project documentation will be controlled under CM; however, requirements are particularly important. The requirements are contractually binding to all development contractors and their sub contractors, and they serve as the foundation upon which the contractors will design and build GOES-R. CM Process for the GOES-R Program is outlined in P-417-R-PLN-0035.

The basic objectives of the GOES-R CM program are:

- Implements and maintains a CM system covering all of GOES-R Series
- The GOES-R ISSO shall be a mandatory voting member of the CCB.
- Establishes GOES-R baselines through all phases of the GOES-R Program
- Manages GOES-R configurations and program data
- Establishes configuration identification and control of all GOES-R baseline items
- Establishes a method of configuration status accounting for all approved changes to GOES-R Series baselines
- Establishes procedures and conditions for performing configuration audits
- Establishes an GPO Configuration Control Board (CCB)
- Coordinates GOES-R GPO CM activities with the Flight Project, Operation Project and the implementation contractor's CM functions



**Figure 18: Program Level Change Request Process (Level II)**

The change process is composed of three main components; the Engineering Review Board (ERB), the Configuration Control Board (CCB), and the Program Configuration Control Board (PCCB).

**Engineering Review Board (ERB):** The Engineering Review Board determines the validity and necessity of proposed requirements changes and other contract applicable document (SOW, CDRL, and WBS) prior to their introduction into the formal CM process. The ERB will be chaired by the Systems Engineering Lead at the program or project level. At the project level, the ERB chairman may designate an alternate at his/her discretion. At the program level, either the Ground Segment Project Systems Engineering Lead or the Flight Project Systems Engineering Lead may be called upon as the acting ERB chairman in the absence of the Program Systems Engineering Lead. The chairman is responsible for inviting members of the engineering review board in accordance with the subject matter of the change. These members will finalize a technical impact analysis of the proposed change. The CCR may also be submitted to the Program/Project Control team for an initial cost and/or schedule impact analysis. If the change is validated, the ERB will provide its recommendation and impact study results to the Configuration Control Board (CCB).

**Configuration Control Board (CCB):** The Configuration Control Board will review and consider the CCR and all analysis associated with it. CCB members will make a recommendation to the SPD or Project Managers, who are responsible for final disposition. If a CCR is approved, Contracts staff will be notified for their review for contractual implications.

**The Program CCB (PCCB):** The PCCB is chaired by the System Program Director (SPD), will control Level II requirements, changes which affect both Projects, changes that effect external interfaces, and any other that it deems necessary. The Deputy SPD is the designated alternate chairman. The Project Managers (PM) will chair the project CCB and control Level III (and below) changes. The deputy PMs are the designated alternate chairman.

## 7.2 Program Documentation Library

The GOES Documentation Library is the official point of receipt, storage and distribution for all project documentation associated with the GOES Program. All documentation is cataloged, controlled, and retained in a database management system. The library collection encompasses all types of media and employs various distribution methods. The NASA Work Instruction 415-WI-1410.1.1C (or its follow on) establishes the procedures for cataloging, controlling and disbursing GOES-R documentation.

## **8 MISSION ASSURANCE**

The GOES-R Mission Assurance Plan (MAP), 417-R-MAP-0080 is the GOES-R Mission Assurance governing document. This MAP describes the GOES-R Program Office (GPO) responsibilities and the planned government role in end-to-end Mission Assurance for the GOES-R System. The Projects will flow the MAP requirements for each contract.

## **9 SPECIALTY PLANS**

GOES-R has specialty plans for the following areas:

- Environmental Management Plan
- Export Control Plan
- IT Management

A description of each is listed below.

### **9.1 Environmental Management Plan**

The Program and Projects will follow guidelines of GSFC Standard Environmental Plan as disseminated by GSFC Code 250 and relevant NOAA regulations. Flight Project procedures will be determined by NASA, Ground Segment Project procedures will be established by NOAA. The GOES-R Environmental Management Plan will be prepared in cooperation with the GSFC Safety and Environmental Division. Facilities to be addressed will be the necessary upgrades to the Wallops Command and Data Acquisition Station (CDAS), the NOAA Satellite Operations Facility (NSOF) upgrades, and construction activities at the Backup Site. Environmental impacts will be considered in project planning during the preliminary design efforts and be updated throughout the lifecycle.

### **9.2 Export Control**

Export control will be in accordance with the provisions of the International Traffic in Arms Regulations (ITAR) 22 CFR 120-130.

### **9.3 IT Management**

Program Office IT Management infrastructure will be managed at GSFC according to NOAA rules, subject to GSFC audit if required.

The GOES-R Information System Security Officer (ISSO) will implement an IT Security Program that ensures adequate protection of the GOES-R mission, data, and components. The IT Security program shall comply with Federal, Department of Commerce, NOAA and NASA policy, as well as requirements documented in NIST guidance. IT Security Risk to the system will be continually analyzed through design, development, and implementation to identify and correct system vulnerabilities. The GOES-R ISSO will work with the ISSOs from the operational elements to ensure that the system meets security requirements for fielding in those elements operational environments. Prior to operations, the GOES-R ISSO is responsible for performing security functions to include providing security sign-off of changes after the system is placed under configuration control, managing accounts, monitoring system usage, and ensuring software patch levels are maintained. The GOES-R Program Office shall provide IT Security documentation compatible with NIST Guidance to support Security Certification and Accreditation.

Ground segment related IT management at NSOF and Wallops and Backup site will be performed in accordance with DOC/NOAA and site specific regulations and processes. Specific requirements, guidelines and standards include:

- DOC IT Security Program Policy and Minimum Implementation Standards
- NIST SP 800-18, Revision 1, Guide for Developing Security Plans for Information Technology Systems.
- NIST SP 800-28 Guidelines on Active Content and Mobile Code
- NIST SP 800-30, Risk Management Guide for Information Technology Systems
- NIST SP 800-34, Contingency Planning Guide for Information Technology Systems
- NIST SP 800-37, Guide for the Security Certification and Accreditation of Federal Information Systems
- NIST SP 800-42, Guideline on Network Security Testing
- NIST SP 800-47, Security Guide for Interconnecting Information Technology Systems
- NIST SP 800-53, and -53 Revision 1, Recommended Security Controls for Federal Information Systems
- NIST SP 800-53A, Guide for Assessing Security Controls in Federal Information Systems
- NIST SP 800-60, Guide for Mapping Types of Information and Information Systems to Security Categories
- NIST SP 800-64, Security Consideration in the Information System Development Life Cycle
- NIST SP 800-94, Guide to Intrusion Detection and Prevention Systems

Other guidance utilized:

- OMB A-130, Appendix III, Security of Federal Automated Information Resources
- Federal Information Security Management Act of 2002
- OMB M06-16, Protection of Sensitive Agency Information
- Federal Information Processing Standard (FIPS) 200, Minimum Security Requirements for Federal Information and Information Systems
- FIPS 199, Standard for Security Categorization of Federal Information and Information Systems
- NOAA Administrative Order 212-13, Information Technology Security Policy
- NOAA IT Security Manual, NOAA 212-1300 through 1305

## **10 FACILITIES MANAGEMENT**

For efficiency, the GOES-R Program intends to maximize collocation of personnel within the program and with GOES NOP and POES programs. Office space is allocated to each project/division based on current staffing requirements. Each project/division is responsible for assigning and managing office space within its allocated area, with approval from the DSPD. Each year, as a minimum, Program Control will assess space requirements and allocations with projects. This assessment will be reviewed by the SMT. Any significant changes in overall GOES-R space requirements will be managed via the GSFC space management board process.

### **10.1 Co-located GOES-R Program and Project GSFC Offices**

The GOES-R Program and Ground Segment Project staff includes government and contractor personnel collocated on multiple floors within Building 6 at GSFC which share common resources such as power, water, telecommunications, computer support and other resources. The facilities are owned and operated by NASA and provided based upon a MOU agreement between NOAA and NASA, a copy of which can be found in Appendix B of this document.

### **10.2 NOAA Satellite Operations Facility (NSOF) Spaces**

Space for up to 30 GOES-R Program/Ops Project staff members (government and contractors) will be required at NSOF during the A&O Phase of the GS implementation. This is to ensure that proper oversight and management can be provided through this phase.



### **10.3 Wallops Ground Facility**

For Wallops, space for up to 10 GOES-R Program/Ops Project staff members (government/contractors) will be required during the A&O Phase of the GS implementation.

### **10.4 Back-up ground facility**

At the Back-up Ground Facility up to 20 GOES-R Program/Ops Project staff members (government/contractors) will require office space during the A&O Phase of the GS implementation. The staff member requirement depends on the level of back up functionality approved for the facility. Operational spaces will be required to house back-up ground systems. Facilities for the Back-up Ground Facility will be acquired in accordance with the CFR 41 Chap 101 Public Contracts and Property Management, and relevant NOAA regulations.

## APPENDIX A: ACRONYMS

A&O	Acquisition and Operations
AA	Archive and Access
AA	Assistant Administrator (NOAA Organization)
AA	Associate Administrator (NASA Organization)
ABI	Advanced Baseline Imager
ACS	Attitude Control System
AGO	Acquisition & Grants Office
ARB	Acquisition Review Board
ATC	Assurance Technology Corporation
AWC	Aviation Weather Center
AWG	Algorithm Working Group
BSS	Boeing Satellite Systems
BW	Bandwidth
CARD	Cost Analysis Requirements Document
CBE	Contractor Best Estimate
CCB	Configuration Control Board
CDRL	Contract Deliverables Requirements List
CITRB	Commerce Information Technology Review Board
CLASS	Consolidated Large Array Stewardship System
CMC	Center Management Center
CONOPS	Concept of Operations
DOC	Department of Commerce
DOD	Department of Defense
DRS	DRS Technologies
ECRB	Engineering Change Review Board
EM	Enterprise Management
EUVS	Extreme Ultra Violet Sensor
EVM	Earned Value Management
EXIS	EUVS/XRS Irradiance Sensor
FPA	Focal Plane Assembly
F&PS	Functional and Performance Specification
FPM	Flight Project Manager
FRR	Flight Readiness Review
GAO	Government Accountability Office
GEO	Geostationary Earth Orbit
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GLM	Geostationary Lightning Mapper
GIRD	General Interface Requirements Document
GOES	Geostationary Operational Environmental Satellite

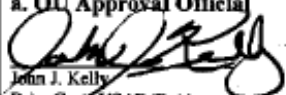
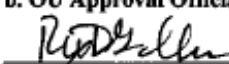
GORD	Geostationary Operations Requirements Document
GORWG	GOES Operational Requirements Working Group
GRB	Global Re-Broadcast
GPO	GOES-R Program Office
GS	Ground Segment
GSPM	Ground Segment Project Manager
GSFC	Goddard Space Flight Center
HES	Hyperspectral Environmental Suite
IBR	Integrated Baseline Review
IIR	Integrated Independent Review
I/F	Interface
IMC	Image Motion Compensation
IRAD	Independent Research and Development
IRD	Interface Requirements Document
IRT	Independent Review Team
IT	Information Technology
ITU	International Telecommunication Union
ITT	ITT Industries
JOFOC	Justification for Other than Full and Open Competition
JCSDA	Joint Center for Satellite Data Assimilation
KDP	Key Decision Point
LCC	Life Cycle Cost
LIRD	Level I Requirements Document
LM	Lockheed Martin
LMATC	Lockheed Martin Advanced Technologies Center
LRR	Launch Readiness Review
LW	Longwave
LWIR	Longwave Infrared
LRD	Launch Readiness Date
MAP	Mission Assurance Plan
MAR	Mission Assurance Requirements
MEO	Medium Earth Orbit
MM	Mission Management
MOU	Memorandum of Understanding
MRD	Mission Requirements Document
MRR	Mission Readiness Review
NASA	National Aeronautics and Space Administration
NEC	NOAA Executive Council
NEP	NOAA Executive Panel

NESDIS	National Environmental Satellite and Data Information Service
NCDC	National Climate Data Center
NDE	NPOESS Data Exploitation
NGDC	National Geophysical Data Center
NGC	Northrop Grumman Corp.
NITRB	NESDIS Information Technology Review Board
NOAA	National Oceanic and Atmospheric Administration
NPOESS	National Polar-Orbiting Environmental Satellite System
NPG	NASA Procedures & Guidelines
NPP	NPOESS Preparatory Project
NSOF	NOAA Satellite Operations Facility
NTIA	National Telecommunications and Information Administration
NWS	National Weather Service
OCIO	Office of the Chief Information Officer
O&S	Operations and Support
OPS	Operations
O&S	Operations and Support
OSD	Office of Satellite Development
OSDPD	Office of Satellite Data Processing & Distribution
OSO	Office of Satellite Operations
PD	Product Distribution
PDR	Preliminary Design Review
PEB	Performance Evaluation Board
PEB	Power Electronics Box
PDRR	Program Definition and Risk Reduction
PG	Product Generation
PMC	Program Management Council
PMR	Program Management Review
POP	Program Operating Plan
PORD	Performance Operations Requirements Document

PTM	Prototype Model
RF	Radio Frequency
RFA	Request for Action
RFP	Request for Proposal
RVS	Raytheon Vision Systems
S/C	Spacecraft
SEB	Source Evaluation Board
SCR	System Critical Review
SEC	Space Environment Center
SEISS	Space Environment In-Situ Suite
SEMP	Systems Engineering Management Plan
SETA	System Engineering and Technical Assistance
SDR	System Definition Review
SIS	Solar Imaging Suite
SPD	System Program Director
SRB	Standing Review Board
SRP	System Review Plan
SSO	Source Selection Official
STAR	SaTellite Applications Research
SUVI	Solar Ultra Violet Imager
SVU	SAP Version Update
S/W	Software
TA	Technical Authority
TIM	Technical Interface Meeting
TRD	Technical Requirements Document
UET	User Education and Training
UIID	Unique Instrument Interface Document
UNH	University New Hampshire
VNIR	Visible Near Infra-Red
VIS	Visible
XRS	X-Ray Sensor
WCDAS	Wallops Command and Data Acquisition Station
WWB	World Weather Building

# APPENDIX B: GOES-R MEMORANDUM OF UNDERSTANDING

Agreement  
NOAA/NASA Support of the GOES-R Program  
Page 1 of 2

<b>DEPARTMENT OF COMMERCE INTERAGENCY AND OTHER SPECIAL AGREEMENTS</b>	
<b>1a. AGREEMENT NUMBER</b>	<b>b. AMENDMENT NUMBER (if applicable)</b>
<b>2. PARTIES TO THE AGREEMENT</b>	
<b>a. NAME OF OPERATING UNIT AND OFFICE</b> (Name of administrative contact, including address, telephone and FAX numbers and e-mail.)  ALC: 13140001 DUNS: 784769085 U.S. Department of Commerce, National Oceanic and Atmospheric Administration National Environmental Satellite, Data, and Information Service 1335 East-West Highway Silver Spring, MD 20910-3283 Admin POC: Lisa Hurt email: <a href="mailto:Lisa.hurt@noaa.gov">Lisa.hurt@noaa.gov</a> Phone: 301-713-0088 x165 Fax: 301-713-3599  <input checked="" type="checkbox"/> Requesting OU <input type="checkbox"/> Servicing OU	<b>b. NAME OF OPERATING UNIT AND OFFICE</b> (Name of administrative contact, including address, telephone and FAX Numbers, and e-mail.)  ALC: 80000002 DUNS: 042273664 National Aeronautics and Space Administration Goddard Space Flight Center 8800 Greenbelt Road Greenbelt, MD 20771 Admin POC: Steven J. Dobrosielski email: <a href="mailto:Steven.J.Dobrosielski@nasa.gov">Steven.J.Dobrosielski@nasa.gov</a> Phone: 301-286-7931 Fax: 301-286-9777  <input type="checkbox"/> Requesting OU <input checked="" type="checkbox"/> Servicing OU
<b>3. PROJECT TITLE OR PURPOSE</b>  GOES-R Program Support	<b>4. GOODS AND SERVICES BEING EXCHANGED</b> (The description of goods and services being exchanged and delivery requirements are included in the attached terms and conditions.)
<b>5. LEGAL AUTHORITY</b>  National Aeronautics and Space Act of 1958, codified at 42 USC section 2473(c)(5) and (6). See Section 2 of the attached terms and conditions.	<b>6. ANTICIPATED PERIOD OF AGREEMENT</b>  START DATE: See last date of signature in Block 8  COMPLETION DATE: See Section 15
<b>7. FUNDING</b>	
<b>a. Estimated Total Cost</b>  See Section 7	<b>b. Funds Citation/Cost Center</b>  See Section 7  Frequency of Distribution: <u>See Section 7</u> (quarterly, monthly, etc.)
<b>c. Cost Allocation</b>  <input type="checkbox"/> 100% reimbursed by requesting Operating Unit  <input checked="" type="checkbox"/> Other. Explain: <u>See Section 7</u>	
<b>d. Funds Availability/Budget Approval</b> : See Section 7	
<b>8. EXECUTION OF THE AGREEMENT</b>	
<b>a. OU Approval Official</b>  John J. Kelly Brig. Gen., USAF (Ret.) Deputy Under Secretary for Oceans and Atmosphere Date: <u>6/15/07</u>	<b>b. OU Approval Official</b>  Rex D. Geveden Associate Administrator National Aeronautics and Space Administration Date: <u>06.12.07</u>

**MEMORANDUM OF UNDERSTANDING BETWEEN  
THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
AND  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
REGARDING THE  
GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE, SERIES R**

**1. PURPOSE**

The U.S. Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), National Environmental Satellite, Data, and Information Service (NESDIS), and the National Aeronautics and Space Administration (NASA) are committed to successful planning, acquisition, and operation of the Geostationary Operational Environmental Satellite Series R (GOES-R) program. The purpose of this agreement is to define a relationship between the parties that results in the successful planning, implementation, and management of the GOES-R program. This agreement, in and of itself, does not obligate or transfer funds.

**2. AUTHORITY**

NOAA and NASA have authority to enter into this agreement pursuant to section 203(c)(5) and (6) of the National Aeronautics and Space Act of 1958, codified as 42 USC section 2473(c)(5) and (6). These sections authorize the provision of services, equipment, personnel, and facilities by either agency as necessary to meet the objectives of the agreement, on such terms as may be deemed appropriate. In addition, NOAA has programmatic authority for the activities described herein pursuant to 15 USC section 313 and 49 USC section 44720.

**3. BACKGROUND**

NOAA operates a system of environmental satellites in geostationary orbits known as GOES. These satellites provide continuous monitoring from the same longitude, allowing the tracking and detection of environmental phenomena that cannot be achieved using polar-orbiting satellites, which provide global coverage that geostationary satellites cannot. GOES spacecraft provide critical atmospheric, oceanic, climatic, solar, and space data images in near real-time and support weather forecasting, climatologic analysis and prediction, ecosystems management, and safe and efficient public and private transportation.

For GOES-R, NOAA will continue to have overall responsibility and accountability for the program. Both NOAA and NASA will acquire elements of the system under the auspices of an integrated NOAA/NASA program office, led by NOAA and located at the Goddard Space Flight Center (GSFC). The GOES-R program must have dedicated, collocated program management, systems engineering, and scientific support for which NOAA will provide reimbursement funding to NASA. This agreement is necessary to define the scope of support including the level of reimbursable, dedicated services that will be provided from NASA to NOAA.

Final – June 12, 2007

#### **4. SCOPE**

The activities to be undertaken pursuant to this agreement include all support required to ensure the GOES-R system meets program requirements and schedule milestones. The GOES-R program includes the Program Office, the Flight Project, and the Operations Project. The Program Office includes all program management, acquisition strategy management, program level Systems Engineering and Integration, scientific, technical, and administrative support. The Flight Project includes the instruments, spacecraft, launch services, satellite integration, and on-orbit satellite initialization and checkout. The Operations Project includes the mission management, data calibration, product generation, product distribution, archive and access, user interface, and operations support.

Nothing contained in this agreement shall be interpreted in a manner that is inconsistent with or contrary to the purpose or intent of any Act of Congress establishing, affecting, or relating to the agreement or any applicable Federal or state law.

#### **5. GOVERNING DOCUMENTS**

**Applicable Documents:** The implementation and execution of this agreement shall be in accordance with the requirements of the GOES-R Management Control Plan (MCP). The MCP will be drafted by the GOES-R Program Office and approved by NESDIS and GSFC within 90 days of the signing of this agreement. Authority to extend the 90-day period is jointly delegated to the Assistant Administrator, NOAA Satellite and Information Service (NESDIS AA) and to the NASA Chief Engineer; such authority will be exercised jointly by the NESDIS AA and NASA Chief Engineer.

**Guidance Documents:** Guidance for processes for this program will be derived from the NASA Procedural Requirements (NPR) 7120.5D as provided in the MCP. Although NPR 7120.5D and other NASA technical oversight processes are referenced throughout this MOU, all references to any such technical oversight processes or other processes throughout this MOU are specifically defined by the MCP and the express understanding of the parties hereto that the NESDIS, NOAA or DOC (as appropriate) will play an oversight role, or other specific roles as outlined in the MCP, in the application of those NASA processes to the GOES-R program. The GOES-R Flight Project will be managed in accordance with NPR 7120.5D, as specifically implemented by the MCP as needed and agreed to by both parties.

#### **6. SPECIFIC DUTIES AND RESPONSIBILITIES**

NOAA (NOAA includes DOC, NOAA and NESDIS throughout this MOU, unless specified otherwise) and NASA shall each provide sufficient personnel to support their program/project functions as specified in the approved MCP.

Consistent with Section 5 and standard NOAA and NASA practices, the parties agree to the following:

- A. NOAA and NASA shared responsibilities include:

**Final – June 12, 2007**

1. NOAA and NASA Administrators will meet at least annually and on an as needed basis to assess the status and progress of the program.
2. NESDIS and GSFC shall ensure the GOES-R MCP is completed and signed within 90 days of the signing of this agreement, unless extended in accordance with Paragraph 5.
3. NOAA and NASA will support an integrated program/projects approach with co-located program and project offices.
4. Systems Engineering and Integration (SE&I) will be a government led activity residing within the Program Office. The Program Systems Engineer (PSE) position will initially be staffed by NASA but NOAA will maintain significant involvement in the SE&I function. The parties to this MOU understand that the goal is to eventually transition the PSE position for SE&I from a NASA employee to a NOAA staffed employee.
5. NOAA and NASA will jointly establish a Standing Review Board in accordance with NPR 7120.5D.
  - a. Standing Review Board shall be co-chaired by NOAA and NASA
  - b. Standing Review Board purpose and membership will be coordinated between NOAA and NASA.
6. The Joint Mission Readiness Review.
7. The Joint Flight and Launch Readiness Reviews.
8. The program and projects will be executed in accordance with applicable NASA/GSFC and NOAA/DOC technical standards and practices as outlined in the MCP.
9. Management, reporting, and oversight of activities will be accomplished through both DOC/NOAA and NASA processes.
  - a. NOAA's Program Management Council (PMC) oversees the GOES-R Program, including the Flight and Operations Projects.
  - b. NASA's GSFC Center Management Council (CMC) oversees the activities, products, and performance of the GOES-R Flight Project and provides advice to NOAA regarding the activities, products, and performance of the GOES-R Operations Project.
10. Coordination of all GOES-R legislative actions, including congressional testimony and questions for the record; public affairs releases and educational; training; or other releases to industry or the public. NOAA retains lead agency status for all legislative efforts. NASA agrees to provide assistance to NOAA as requested.
11. NOAA and NASA agree to form a collaborative GOES-R Program contracting partnership to ensure effective and efficient support for all GOES-R Program and Project contract actions. NOAA and NASA Contracting Officers will retain full agency authorities and continue agency reporting responsibilities while operating in partnership with each other. The partnership intends to collaborate through the sharing of contracting staff resources for NOAA and NASA contracts, establish action approval levels for Program review, and operate within appropriate current or future NOAA/NASA processes, policies, and procedures.
12. For Program and Project Office operations the NESDIS and GSFC Chief Information Officers (CIOs) shall agree on procedures for any information technology (IT) issues affecting NOAA hardware, software, connectivity, or the

security of NOAA information. Procedures shall be in accordance with DOC and NASA policies, federal law, and other federal guidance.

- B. NOAA is ultimately responsible and accountable for overall success of the GOES-R program. Specific responsibilities include:
1. Decision authority for Key Decision Points as described in MCP. (Currently DOC)
  2. Decision authority for mission readiness, flight readiness and launch readiness.
  3. Decision authority for overall acquisition strategy. (DOC)
  4. Procurement, management, and execution of the Operations Project.
  5. Staffing for the senior leadership of GOES-R. NOAA designated key positions include:
    - a. System Program Director (SPD)
    - b. Deputy SPD
    - c. Program Control Lead
    - d. Operations Project Contracting Officer
    - e. Program Scientist
    - f. Deputy Flight Project Manager
    - g. Operations Project Manager.
  6. Perform program control functions as described in the MCP.
  7. Participate in the program systems engineering function and assume lead for this function in any transition from NASA to NOAA.
  8. Lead Program budget development for fiscal year and life cycle in accordance with DOC/NOAA processes based upon inputs from the projects and utilizing the processes described in the MCP.
  9. Participate in NASA acquisition and contract execution activities as identified in the approved acquisition strategy, including, at a minimum: The NESDIS AA will attend any Source Evaluation Board (SEB) briefings to the NASA Source Selection Official (SSO) concerning this acquisition or the source selection thereof.
  10. For award fee contracts, the GOES-R SPD will chair the Performance Evaluation Boards (PEB) for the spacecraft and major ground contracts and make recommendations to both the NOAA Fee Determination Official (FDO) and the NASA FDO in award fee determinations.
  11. Determine, in consultation with NASA, the composition and procedures for any Failure Review Board or Mishap Investigation Board for ground failures or mishaps at the major assembly level or any on-orbit failure that impacts Level I performance requirements. Flight Project Failure Review Boards or Mishap Investigation Boards shall be conducted in accordance with NASA procedures.
  12. Provide all briefs and interactions with the Executive and Legislative branches on GOES-R unless specifically delegated to NASA or specifically requested from NASA.
  13. Lead all international agreements and other partnership agreements external to NOAA/NASA relating to GOES-R.
  14. Develop and control the Level 1 requirements, Mission Requirements Document (MRD), and Concept of Operations (CONOPS).
  15. Develop and control the Program Plan and approval of the Project plans.



C. NASA responsibilities include:

1. Procurement, management, and execution of the Flight Project.
2. Staffing GOES-R senior leadership positions including:
  - a. Assistant SPD
  - b. Flight Project Manager
  - c. Deputy Operations Project Manager
  - d. Program Mission Assurance Lead
  - e. Program Systems Engineering Lead
  - f. Flight Project Contracting Officer
3. Provide project budget requirements to the program.
4. Provide standard NASA technical oversight resources pursuant to the MCP.
5. NASA GSFC is responsible for Program and Project mission assurance management and infrastructure.
6. As specifically described in the MCP and provided as in Section 5 to this MOU, NASA GSFC is responsible for the Technical Authority process including leading technical reviews associated with the Technical Authority process.
7. As part of the SSO source selection briefing(s), the NESDIS AA will be afforded the opportunity to provide comments, and raise questions or concerns for the SSO to consider prior to selection
8. For major elements of flight project award fee contracts, the NASA FDO shall brief NESDIS AA on decision and rationale.

## 7. COSTS

a. All activities under or pursuant to this agreement are subject to the availability of appropriated funds, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 USC 1341.

b. Using the process and limitations set forth herein, NASA shall be reimbursed its actual, allowable and allocable direct and indirect costs for labor, contracted support services as well as facility and IT support for all Federal and support contractor personnel assigned to the GOES-R program and working at the GSFC facility. NASA has changed its approach to calculating full cost. It has eliminated separate rates for pools (IT, Facilities, Center G&A) and combined them into a larger Center Management and Operations overhead structure. For purposes of this agreement, reference to separate pools is maintained to provide traceability to the pre-negotiated agreement from March 2005. The parties agree to the following:

A. GSFC TECHNICAL MANAGEMENT:

1. FY07: Facilities and IT costs applicable to GSFC Tech Management are waived. Center G&A is applicable.
2. FY08: Facilities and IT costs applicable to GSFC Tech Management are applicable and shall be consistent with a separately negotiated NOAA/GSFC use permit.

B. NOAA GOES-R HOUSING:

1. FY07: Facilities and IT costs are applicable. Center G&A is waived.

2. FY08: Facilities and IT costs are applicable and shall be consistent with a separately negotiated NOAA/GSFC use permit. Center G&A is waived.

**C. NASA CORPORATE G&A:**

1. NASA corporate G&A payments do not apply to this agreement

**D. FY09 AND BEYOND**

1. Funding for indirect support will be calculated to reflect the market value of services provided. The pricing applied will not result in reimbursable revenue that is in excess of the full cost of providing the work. Calculation of the market value will be consistent with guidance included in NASA Financial Management Regulations (FMR) Volume 16.

Criteria specified in this agreement for calculation of indirect costs are applicable only to the GOES-R Program Support agreement. Any agreements for new work beyond the GOES-R series will be separately developed consistent with NASA policy for reimbursable activities.

Funding from NOAA for the total estimated value of this agreement is not presently available and is subject to receipt of sufficient annual appropriations and quarterly apportionments. Funding for this agreement will be documented in the Level I requirements document which will be finalized as a part of the Department of Commerce KDP-C/D process. When funding becomes available, NOAA will issue an order in accordance with the following paragraph. Accordingly, the parties agree that NOAA is not obligated to transfer funding to cover the full value of this agreement, nor is NASA obligated to perform services that exceed the cumulative amount of funds actually transferred through orders issued against this agreement. Details of these procedures and the associated documents will be explained in the MCP.

NOAA will issue orders for products and services according to standard NOAA procedures. The detailed procedures will be described in the MCP. NOAA and NASA will agree upon the type and extent of work required consistent with the acquisition strategy and other management control plans; the cumulative amount of funds obligated and made available; and the estimated period of performance covered by the funding. Detailed procedures and requirements concerning NASA billing and NOAA reimbursements shall be in accordance with standard NOAA and NASA operating procedures.

## **8. REPORTING REQUIREMENTS**

Timely and comprehensive financial, programmatic, and technical reporting to NOAA and NASA management is essential to ensure mission success. Both parties commit to complete transparency on all aspects of the GOES-R program.

At a minimum, the projects shall provide the following regarding their GOES-R activities to the SPD:

- A. Monthly status review reports.

- B. Monthly Contract Cost Performance Reports, including Earned Value Management data, for all contracts executed in support of GOES-R except as agreed to by the SPD.
- C. Quarterly Contract Cost Funds Status Reports for all contracts executed in support of GOES-R except as agreed to by the SPD.
- D. Monthly Contract Action Reports for all contracts. Specific content shall be coordinated with the SPD.
- E. Additional technical and programmatic data as requested by the SPD on an *ad hoc* basis.

At a minimum, the program and projects shall provide the following regarding their GOES-R activities:

- A. Monthly Status Reviews to NOAA PMC. Specific content shall be coordinated with the SPD.
- B. Quarterly Status Reviews to DOC.
- C. Monthly Status Reviews to GSFC CMC and, if requested, to the appropriate NASA HQ PMC.
- D. Reports as required to fulfill information resource investment management and information security requirements.

The format and content for these Status Reviews from the program and projects shall be coordinated by the SPD, with GSFC Monthly Status Review (MSR) reporting meeting at least the minimum reporting requirements of the GSFC CMC.

DOC, NOAA, and NASA management shall be invited to participate in each others' management reviews of GOES-R activities.

## **9. CONTROL OF GOVERNMENT OWNED PROPERTY**

NOAA requires identification and tracking of all property acquired using its funds as described in the MCP.

## **10. RELEASE OF TECHNICAL AND PUBLIC INFORMATION INCLUDING DATA ACCESS AND UTILIZATION**

All scientific and technical data developed or otherwise obtained or produced shall be shared between the parties to this agreement. All contracts and agreements entered into by each party shall ensure there is no restriction on the sharing of data between NOAA and NASA. It is the responsibility of the party producing the data to ensure that any restrictive markings associated with third party access to data or information is included with such data/information when provided to the other party. Support contractors having properly executed a non-disclosure agreement and having no conflict of interest shall also be entitled to view such data/information subject to the discretion of the party managing the contract.

Each party is responsible for complying with the terms of restrictive markings that may be placed on data or information. To the extent that data or information is properly released, appropriate

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credit shall be given to NOAA and NASA as may be specifically directed in the approval for public release.

## **11. LIABILITY**

Each party agrees to assume liability for its own risks associated with activities undertaken in this agreement.

## **12. BUILDING OPERATIONS, MAINTENANCE, AND PROTECTION**

GSFC managers shall allocate sufficient work space, including class A office space, at NASA's GSFC facility, in accordance with the GSFC-NOAA use permit, for all GOES-R program office badged government and on-site support contractor personnel. NOAA will reimburse NASA for any product or service considered in excess of those normally provided for GSFC programs of similar scope and cost. As a minimum, support will include:

- A. Facility management, security protection including badges for on-site personnel, and maintenance of the premises occupied by the GOES-R Program Office.
- B. Access to all GSFC common-use areas including library, health unit, fitness unit, cafeteria, and parking and use of the GSFC motor pool and other transportation services in accordance with normal GSFC regulations. Certain areas, such as the health and fitness units and the motor pool, are restricted to civil servant use only.
- C. IT systems support and maintenance for all personal computers and other equipment at a priority level commensurate to other GSFC programs of equivalent magnitude.
- D. Facility maintenance and unscheduled repair services in accordance with GSFC regulations.

NOAA agrees that all GOES-R permanent program office personnel will comply with all GSFC facility regulations, security procedures, safety and environmental regulations, and training requirements.

## **13. RESOLUTION OF DISAGREEMENTS**

Nothing in this agreement is intended to conflict with current DOC or NASA directives. If the terms of this agreement are inconsistent with existing directives of either of the offices entering into this agreement, those portions of this agreement which are determined to be inconsistent shall be invalid, but the remaining terms and conditions not affected by the inconsistency shall remain in full force and effect. At the first opportunity for review of this agreement, all necessary changes will be accomplished either by an amendment to this agreement or by entering into a new agreement, whichever is deemed expedient to the interests of both parties. Should disagreement arise about the interpretation of the provisions of this agreement or amendments and/or revisions thereto that cannot be resolved at the operating level, the area(s) of disagreement shall be stated in writing by each party and presented to the other party for consideration. If an agreement on interpretation is not reached within thirty (30) days, the parties shall forward the written presentation of the disagreement to respective higher officials for appropriate resolution. Disagreements concerning programmatic issues that cannot be resolved by the GOES-R SPD shall

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be documented in writing and elevated to the NESDIS Assistant Administrator and the GSFC Director for resolution. Failing resolution at that level, the issue shall be elevated to the signatory positions to this agreement and successively higher positions as necessary for final resolution.

#### **14. DURATION OF AGREEMENT**

This agreement will become effective when signed by all parties and will remain in effect throughout the life of the GOES-R program.

The NESDIS Assistant Administrator and the GSFC Director will review the agreement annually to determine if it should be revised, renewed, or canceled. This review can be combined with the preparation of annual project spend plans. Proposed revisions to the succeeding year's agreement shall be provided to the other party one month prior to the end of the fiscal year.

#### **15. AMENDMENT AND TERMINATION**

Amendments to this agreement shall be in writing and are subject to the mutual agreement of the parties.

This agreement may be terminated at any time by either party; the terminating party must provide advanced written notice to the other party three hundred and sixty-five (365) calendar days prior to termination. In the event of termination of this agreement by NOAA, NOAA shall reimburse NASA for costs associated with this termination, including the termination costs for terminating contracts entered into by NASA pursuant to this agreement and costs necessary for the orderly closeout of activities under this agreement. In the event of termination of this agreement by NASA, NASA shall bear the costs associated with this termination, including the termination costs for terminating contracts entered into by NASA and NOAA pursuant to this agreement and any costs necessary for the orderly closeout of activities under this agreement.

## APPENDIX C: PRODUCT MATURITY FOR GATEWAY REVIEWS

The product maturity matrix for each KDP / Program Gateway / Project Entrance Review is shown below:

Gate	KDP I	Project Entrance B	Project Entrance C	KDP II	Project Entrance D	Program Gateway III	Program Gateway IV	Project Entrance E	Program Gateway V	Project Entrance F
		Segment Concept	Project Baseline	Program Baseline	Project Integration Readiness	Mission Integration Readiness	Mission Readiness Board	Launch/Operations Readiness	Handover Readiness	Disposal Readiness
<b>Document</b>										
CONOPS	P	F	U	U	U	U	U	U		
TRL Assessment	P		U	F	U					
Continuity of Operations	D		P				U	F		
Configuration Mgt Plan	F									
Risk Mgt. Plan	F									
IT Security Checklist	P			F		U				
Systems Engineering Mgt. Plan	F									
Level 1 Requirements	F		U	U						
Integrated Master Schedule	P	P	F	U						
Software Management Plan		P	F							
Staffing Plan	P		F	U						
Facility Plan	P		F	U		U				
NASA/NOAA MOU	F									
Mission Assurance Plan	P		F							
Mission Requirements Document	F		U	U	U					
Mission Level Interface Requirements	P		F	U						
Test, Cal/Val Mgt Plan	D		P	P	F	U				
Verification and Validation Report							U	F		
CARD	P		F	U						
Program / Project Estimates	P		F	U						
Independent Cost Estimate	F		U	U						

Management Control Plan	F			U						
Project Plans	P		F							
Integrated Independent Review Plan	F									
Document Tree	F			U						
Acquisition Plans	F									
OMB Exhibit 300	U		U	U	U		U	U		
WBS	F									
Export control plan		P	F	U						
Environmental Mgt. Plan	P		F	U						
Segment Level Requirements	P	P	F							
Data Management Plan	D		P	F						
Mission Ops Plan			P		F					
Pre-launch Safety Package			P		F		U	U	U	
Operations Handbook					P		U	F	U	
Orbital Debris Assessment		I	P		F					
Disposal Plan					P				P	F
As-Built documentation							U	F		
D-Draft										
P - Preliminary										
F – Final										
U- update										

## **APPENDIX D: GOES HISTORY**

Over the past four decades, environmental stewardship agencies have stated a need for near continuous, timely, high quality observations of the Earth and its environment. As an example, for rapidly changing severe storms (such as hurricanes and storms that produce flash floods, tornadoes or hail), frequent observations of weather phenomena that produce and guide such storms are essential to provide adequate tracking and warning.

The successful development and operation of the spin scan cloud camera on ATS-1 and of a similar camera on ATS-3 (launched in 1967) led to the decision to proceed with an operational system for meteorology. NASA developed the new spacecraft system and built two prototypes, called Synchronous Meteorological Satellites, SMS-1 and SMS-2. They were launched in May 1974 and February 1975. Three identical versions funded by NOAA, GOES-1, -2, and -3, were launched in October 1975, June 1977, and June 1978. The primary sensor on all five satellites was the Visible Infrared Spin Scan Radiometer (VISSR).

GOES-4-7 introduced an improved VISSR, the VISSR Atmospheric Sounder (VAS), which gathered the standard VISSR image data and also took measurements of the atmosphere, enabling meteorologists to acquire temperature and moisture data profiles. GOES-7, launched in 1987, was the last spinner-type geosynchronous satellite. It inaugurated the use of geosynchronous satellites for international search and rescue efforts.

Five satellites, GOES-I through GOES-M, were ordered in the GOES-I series. The design of the GOES-I series represented a major step forward from previous GOES satellites due to the use of separate imagers and sounders with much higher temporal and spatial resolution, more channels and more precise measurements. The GOES I-M satellites incorporate the use of a 3-axis stabilized spacecraft bus allowing continuous observations.

Three additional satellites, GOES-N, -O, and -P (designated the GOES-N series), have been procured subsequent to the GOES-I series. While operating essentially the same set of instruments, the major difference between the GOES-I series and GOES-N series is in the area of navigation and the inclusion of the Solar X-Ray Imager on all satellites (versus only the GOES-M satellite on the previous series). The GOES-I series uses an earth reference system while GOES-N series employs a stellar inertial system.

The GOES-R series of satellites is the newest generation of NOAA's geosynchronous environmental satellites. The GOES-R series represents another major step in providing remotely sensed environmental data. In addition to temporal and spatial improvements, GOES-R instrumentation will provide significant advances in the quality and quantity of remotely sensed environmental data.

### **GOES-R Series ERA**



The National Environmental Satellite, Data, and Information Service (NESDIS) is preparing for the procurement of the GOES-R series. This new series advances the instrument technology of GOES satellites by several decades and introduces new space and ground technology. These technological advances will improve our Nation's ability to monitor and forecast weather, environmental and space phenomena. It will provide a greater than three-fold increase in the types of products produced. GOES-R will expand the nation's capability to acquire, process and disseminate to central processing centers and direct users, environmental data on an extensive spatial range (global, regional, and local) within a variety of time scales (minutes to days). Examples of these include global imagery; cloud and precipitation parameters; atmospheric profiles of temperature, moisture, wind, aerosols and ozone; surface conditions concerning ice, snow, and vegetation; ocean parameters of sea temperature, color and state; solar and in-situ space environment conditions. This data is critically needed for:

- Severe storm watches and warnings
- Tropical cyclones
- Hydrologic forecasts
- Forecasts of the ocean structures
- Solar and space environment forecasts
- Aviation and marine forecasts
- Forecasts of ice conditions
- Seasonal and inter-annual climate forecasts
- Architecture studies for monitoring of climate variability
- Assessment of long-term global environmental change
- Environmental air quality monitoring and emergency response
- Detection and analysis of fires and volcanic eruptions

The GOES-R series acquisition includes five different environmental instrument suites, spacecraft and launch services, ground systems, and the end-to-end systems integration to support GOES-R design, fabrication, testing, launch, and operations.

Instrument development was initiated early for all five instruments for formulation of design and risk mitigation/ reduction activities. These instruments are: (1) Advanced Baseline Imager (ABI); (2) Hyperspectral Environmental Suite (HES); (3) Solar Imaging Suite (SIS); (4) Space Environmental In-Situ Suite (SEISS); (5) Geostationary Lightning Mapper (GLM) and (6) Magnetometer (MAG).

Instrument efforts began in 2001 with the award, by NASA for NOAA, of three firm fixed price (FFP) PDRR contracts for the ABI. FFP PDRR contracts for the HES and SIS were awarded in FY04, SEISS was awarded in FY05, and GLM was awarded in FY06. A cost plus contract for ABI A&O contract was awarded by GSFC in FY04. HES development was discontinued in 2006.

The GOES-R program completed the Program Definition and Risk Reduction (PDRR) phase with three developer contractor teams completing a series of studies to refine system requirements and architectural design. In December 2006, NOAA decided to split the procurement (Acquisition and Operations (A&O) phase) into Space and Ground segment contracts, led by the NASA Flight Project and NOAA Ground Segment Project respectively. The A&O contract awards are expected in 2008, with a first launch readiness expected in December 2014.