TECHNICAL DESCRIPTION
FOR THE DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITES R SERIES (GOES-R) PROGRAM

END-TO-END ARCHITECTURE STUDY

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1.0 TECHNICAL DESCRIPTION (TD)

This TD is an attachment to a Broad Agency Announcement (BAA) OFA-GOES-R-3-0001 from the National Oceanic and Atmospheric Administration, Office of Satellite Development (OSD), NESDIS, Geostationary Operational Environmental Satellite R (GOES-R) Program Office. The Respondent shall provide all professional services including but not limited to: Management, Technical, and Business Personnel; Material, Supplies, and Equipment necessary to support the End-to-End Architecture Studies within the schedule and price defined herein.

The Architecture Studies will be accomplished in two tiers. This TD is for both Tier One and Tier Two. The follow-on Tier Two Option, if exercised, will further refine and advance those research projects and technologies the Government finds innovative, in accordance with its mission needs, and which meet the objective and purpose of this TD—to define the GOES-R end-to-end (ETE) systems architecture.

Respondents may submit proposals on any combination of task areas 1, 2, 3, or 4.

The period of performance for Tier One is up to a maximum of one (1) year, with a potential Tier Two option not to exceed 6 months.

2.0 INTRODUCTION

2.1 BACKGROUND

The primary mission of the U. S. Government (USG), Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA) is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs. This mission requires a continuous capability to acquire, process, archive, and disseminate environmental information and data products to central processing centers and distributed direct users. This information is acquired and distributed on an extensive spatial range (global, regional and local) within a variety of time scales (minutes to days). This information includes, but is not limited to hemispheric 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 conditions and in-situ space environment. These data are critically needed for 1) severe storm and flood warnings; 2) tropical cyclone (hurricane reconnaissance and warnings); 3) hydrologic forecasts and water resources management; 4) ocean surface and internal structures forecasts; 5) medium range forecast outlook (out to fifteen days); 6) solar and space environmental forecasts; 7) aviation forecasts (domestic, military, and international); 8) ice conditions forecasts; 9) seasonal and inter-annual climate forecasts; 10) decadal-scale monitoring of climate variability; 11) long-term global environmental change assessment; 12) environmental air quality monitoring and emergency response; 13) fire and volcanic eruption detection and analysis; and 14) short-term and mesoscale forecast.

To meet requirements and accomplish NOAA's mission, the current geostationary satellite systems carry earth imaging and sounding instruments and other sensors that provide observational data used by the National Weather Service (NWS), the National Environmental Satellite, Data, and Information Service (NESDIS), the Office of Atmospheric Research (OAR), the military, other Government institutions, researchers, and the general public, to monitor the weather, perform climate predictions, and perform related environmental research. GOES currently performs three major functions:

- Environmental Sensing: Acquisition, generation and dissemination of atmospheric imaging and sounding data, solar and space environment (in-situ) data, land and ocean surface data.

- Data Collection: Interrogation and receipt of data from Earth surface-based data collection platforms and relay to the NOAA command and data acquisition stations.

- Data Broadcast: Continuous relay of meteorological data to distributed users, independent of other system functions and relay of distress signals from aircraft or marine vessels to search and rescue ground stations.

Historically, the ground segments associated with the geostationary satellites, which perform the data and product processing, generation of products, distribution, archive and user interface functions, have been addressed independently from the satellites. In the future, proposed ground segments should not necessarily be unique to GOES-R and may include components of existing or future over-arching (higher level) operational systems within NOAA. New and/or upgraded capabilities required for enhanced GOES-R series functions in the areas of product generation, distribution networks, and archive facilities must be identified, planned, budgeted, and implemented in the future GOES-R architecture. To effectively and efficiently meet the GOES-R system requirements, a complete end-to-end (data sensing to information access) approach must be adopted. In addition, the architecture concepts must maintain compatibility with all heritage satellite meteorological information collections and existing interfaces. As a result, the end-to-end GOES-R architecture must define interfaces within the GOES-R system, and external to, the appropriate NESDIS systems.

It is desirable to develop a GOES-R end-to-end that can be a starting point for a future NOAA Observing System Architect (NOSA) Architecture. More information on the NOSA notional architecture can be found at the GOES-R Architecture Study web site in Section 2.7.

For clarification purposes, the term "Respondent" is used herein in the same sense as an "Offeror" is used on a "Request for Proposal". A "successful Respondent" is equivalent to a "Contractor" that has been selected for award.

2.2 GENERAL PURPOSE

The purpose of this investigation is to research and develop concepts and technologies that will enable the GOES-R Program to meet future environmental requirements with

greater efficiency and effectiveness. Our goal is to develop technologies that provide the best possible program capabilities for our users when and where needed in the most cost-effective manner. Specific research interests and objectives are covered in Task Areas 1, 2, 3, and 4. Therefore, for the purposes of this phase, each Task Area Proposal is encouraged to present new and unique approaches and techniques that lead to, or enable revolutionary and evolutionary improvements for the future GOES-R architecture that are consistent with NOAA's notional future integrated observing system architecture; i.e., with NOSA and the Global Communications Systems.

The NOAA Observing System Architecture (NOSA) project is designed to build an architectural framework for guiding NOAA policies and decisions regarding maintenance, deployment, and future replacement of NOAA's many versatile observing systems. These studies are not to design future segments or systems, but to provide assessments of how the GOES-R system could evolve to meet NESDIS's future needs.

2.3 SCOPE

Although a Respondent may investigate one or more of the four task areas, it shall not submit more than one proposal for the same task area. The Respondent may only submit one proposal. The proposal may be single task (25 pages) or multi-task (50 pages). This limitation applies to all narrative and Charts. Each task area will be evaluated independently. If teaming (not required), the proposal shall identify each Respondent and what task area(s) they are proposing.

The Government may award each task to multiple independent Respondents. Each successful respondent will receive a single contract, with up to four study areas, for all selected task areas. The task areas are:

1. Task Area 1: Space and Launch Segments;
2. Task Area 2: Command, Control and Communications (C^3) Segments;
3. Task Area 3: Product Generation Distribution, Archive and Access, and User Interface Segments;
4. Task Area 4: End-to-End Integration of Task Areas 1, 2, and 3.

2.4 INTENT OF THE STUDIES

Each successful Respondent selected to perform the end-to-end architectural study will have a proven record of building comprehensive "GOES-class" operational geosynchronous systems or similar satellite/ground segments, and experience that can be readily leveraged to apply to future GOES-R series contracts.

The architecture is an end-to-end space and ground system including satellite, launch services, C^3, data processing, data distribution, and archiving. It is understood that significant exploration of the science and technology, system trades, and identification of risk factors needs to be researched prior to completing an end-to-end systems architecture.

These studies are not directly tied to the planned phased procurement of the future GOES-R formulation contracts (Spacecraft and/or Ground) that are anticipated to begin in FY05. The Government intends these architecture studies to be an opportunity for Respondents, interested in future GOES-R solicitations/proposals, to propose and explore initial design architectures and test their technical, programmatic and cost feasibility. These studies will allow the successful Respondents an opportunity to provide input to the development of conceptual designs, perform segment and/or system trades, identify and mitigate risks, and begin end-to-end program architecture. Knowledge of the performance and design features of the existing GOES systems is desirable. The results of these studies will help refine NOAA's requirements, identify feasible potential designs, recognize ways to interrelate the segments, culminate in a top-level architecture, and identify the most significant risks.

Architectural designs should consider hardware/software configurations that reduce recurring and non-recurring costs, meet NOAA's capability as it relates to the requirements documents, and permit maintenance by 3rd party maintainer. The current Technology Readiness Levels (TRL) should be identified for any advanced technology proposed, and a path or schedule should be identified as to how the TRL for that innovation will reach TRL 6. The Government requires the ability to seamlessly integrate all hardware and software necessary to perform the mission and continually infuse new technology, as required, without resorting to major system modifications or operations disruption.

Certain trade studies that cut across all tasks include, but are not limited to:

1. Should the GOES-R Satellite Architecture be Consolidated, Distributed, or Other?
2. What is the most effective and efficient means of providing auxiliary services?
3. What are the most effective methods to rebroadcast data products?

The following Table 1 illustrates the research areas identified above, and the permutations that could apply in the Offerors architecture. The word "Other" in Table 1 implies other architectural concepts as identified by the Respondent. The response to the BAA should identify where in this matrix the Offeror will be concentrating its research.

Table 1. – Research Areas

Sat Architecture (TS 1)	Aux Services (TS 2)	Rebroadcast (TS 3)
Consolidated	ON	ON
		OFF
	OFF	ON
		OFF
Distributed	ON	ON
		OFF
	OFF	ON
		OFF
Other	ON	ON
		OFF
	OFF	ON
		OFF

2.5 TRADE SECRET PROTECTION

The content of these studies and the concepts that may lead to any award shall be considered to be business proprietary/competition sensitive, and are not releasable through the Freedom of Information Act (F.O.I.A), pursuant to 5 U.S.C 552(b)(4), "Trade Secrets….", unless required by law, or a court of competent jurisdiction determines otherwise.

Respondents to the BAA are advised that the Government may find it in its best interests to employ selected top-level concepts in the future system requirement documents, while at the same time protecting the Respondent's proprietary information. The Respondents must identify the extent to which the Government is permitted to employ their top-level concepts in future system requirements. Prior to using any information considered by the Respondent to be business proprietary, privileged, or otherwise competition sensitive, the Government will first request approval from the successful Respondent unless it is already clear in the proposal that such data is releasable.

2.6 METHOD OF REVIEW AND ACCEPTANCE OF RESEARCH AND DEVELOPMENT STUDIES PROPOSED UNDER THE BROAD AGENCY ANNOUNCEMENT

The purpose of this BAA is to solicit research proposals in the above task areas, and to encourage as many viable study architectures as possible. The Government will evaluate each response to the BAA by 'task area' and determine how many proposals for each 'task area' merit award.

1. A Respondent may submit only one proposal. The Respondent must submit all task areas in its proposal that it wishes to be considered by the Government.

2. The Respondent is limited to one proposal per task area whether as an Individual Respondent, Prime, or Sub-contractor.

3. Proposals, in order to be eligible for award, must:

    a. Include enough detail of the proposed effort and which task area it applies to.

    b. Detail feasible architectures that will advance R&D studies, or enhance NOAA's mission capabilities or its interests in the GOES-R System.

    c. Demonstrate past and current capabilities in the task area being proposed; such as, design, fabrication, or integration of systems of similar complexity and operations.

    d. Comply with the level of funding the Government has allotted for the applicable study; i.e., be less than or equal to the values set forth in this Section 2.6, Item 8, below.

4. Offers must comply with the funding levels allotted for each Task Area, not exceeding those values, and provide enough detail to enable the evaluators to comprehend the value to NOAA of funding the proposed architecture study. Past experience and current capabilities in the design, fabrication or integration of systems of similar complexity and operations is marginally more important in deciding selection of a Respondent's BAA proposal than its description of feasible architectures that will advance R&D studies and enhance the agency's mission or interests in the GOES-R System.

5. The Government may award a single task or multiple tasks contract to a single Respondent. Each contract will be tailored to the individual Respondent or Prime Contractor.

6. For Task Area 4, the Respondent will be evaluated on its knowledge of the GOES-R End-To-End-System; its knowledge of Task Areas 1, 2, and 3; and, its experience and capability for design, building or integrating a similar system.

7. Respondents shall provide a master schedule, including Tiers 1 and 2, for each Task. This schedule must indicate the projected topics that will be covered at each of the five deliverable milestones in Section 2.11 below, and suggested additional architecture studies advancement during the optional Tier 2 period.

8. Respondents shall submit a price confirmation letter, signed by an authorized corporate official, confirming the individual firm fixed price (FFP) for each study period. The following studies, if proposed, must be priced as follows:

    a. Tier 1: 12 Month GOES-R Initial Concept Study:
        i. Task Area 1: Space and Launch Segment Study—FFP: $1,000,000;
        ii. Task Area 2: C^3 Segment: FFP: $500,000;
        iii. Task Area 3: Product Generation, Distribution, Archive, Etc.; FFP: $500,000;
        iv. Task Area 4: End-to-End Systems Integration: FFP: $500,000.

    b. Tier 2 (OPTIONAL): 6 Month GOES-R Advanced Concept Study:
        i. Task Area 1: Space and Launch Segment Study—FFP: $500,000;
        ii. Task Area 2: C^3 Segment: FFP: $250,000;
        iii. Task Area 3: Product Generation, Distribution, Archive, Etc.; FFP: $250,000;
        iv. Task Area 4: End-to-End Systems Integration: FFP: $250,000.

2.7 REFERENCE DOCUMENTS

The following documents address the performance and functional requirements that the architectural designs must satisfy, and are available from the NOAA/GOES-R Architecture Study web site:

- GOES-R Program Requirements Document (GPRD)
- Mission Requirements Document (MRD)

- General Interface Requirements Document (GIRD)
- Unique Instrument Interface Documents (UIIDs)
- Spacecraft Communications IRDs (GL-C^{3}S, GRB, LRIT, SAR, EMWIN, DCS)

Background Documents:

NOTE: The PRD and MRD take precedence over the background documentation.

- NESDIS Consolidated Product list; Geostationary Operational, Developmental and Experimental Products, January 2002
- Comprehensive Large Array-data Stewardship System (CLASS) Archive and Access Requirements, Draft Version, CSC, January 29, 2002
- Users Identification List
- Point Design Documents, CDC Runs

GOES-R Architecture Study web site:
http://www.osd.noaa.gov/goesr_arch_study/index.htm

2.8 PROJECT MANAGEMENT

The successful Respondent shall perform all program management functions including technical and business management functions that are necessary to execute the total effort required by the contract.

The successful Respondent shall designate a program manager to coordinate day-to-day activities and to act as the technical interface with the Contracting Officers Technical Representative (COTR). The successful Respondent's Program Manager (PM) or designated representative shall be directly responsible for coordinating and managing the following tasks:

- Contract Post-Award Guidance Meeting
- Program Status Reviews (Teleconference)
- Face-to-Face Technical Interchange Meetings (TIM)
- Architecture Research Report(s)

The successful Respondent shall provide contractual and business management efforts necessary to efficiently work with the Government to execute and administer this contract.

The successful Respondent shall be compliant with the International Organization for Standards (ISO)-9000, Quality Management and Quality Assurance.

2.9 CONTRACT AWARD

If warranted by the presence of a bona fide requirement, the Contracting Officer will issue model contracts to selected BAA Respondents. The model contracts shall be the pre-contractual instruments that will be tailored to the scope of the study(ies). Following mutual agreement on the terms, the model contract will become the official contract and the study(ies) will commence.

2.10 DEPARTMENT OF COMMERCE SMALL BUSINESS GOALS

Small business goals are applicable to the Department of Commerce/NOAA and NASA. It is expected that these goals may not be attainable for these Studies standing alone; however, the Respondents are advised that their architectures shall be constructed with the objective of facilitating future small business subcontractor opportunities. The objective will be to meet or exceed small business goals. DOC small business goals are defined on the GOES-R Architecture Study web site.

2.11 SCHEDULE AND COORDINATION

The successful Respondent shall establish, maintain, and control a Program Schedule as set forth in Table 2, to be incorporated in any subsequent contract. As noted above, paragraph 2.6.7, this Schedule shall include the content of the planned studies at each of the following deliverable milestones.

Table 2. - Recommended Schedule

Tier One

Month 1 Kick Off Meeting (15 d)

Month 4 Mid Term Progress Review presented during the TIM by VTC, or at Government facility

Month 8 Draft Architecture Report including successful Respondent's review of the MRD, GIRD, and UIIDs, presented during the TIM by VTC, or at Government facility

Month 11 Architecture Research Findings presented during TIM at Government facility

Month 12 Final Architecture Report

Tier Two (OPTIONAL)

Month 14 Mid Term Progress Review presented during TIM by VTC, or at Government facility

Month 17 Final Presentation presented during TIM by VTC, or at Government facility

Month 18 Final Architecture Report

Informal meetings may be held via teleconference as required and coordinated with the NOAA's COTR and at the request of either the Respondent or Government. These meetings are included in the firm fixed price.

2.12 DELIVERABLES

Documents shall be formatted and delivered in accordance with the Model Contract terms. Each document shall be clearly labeled on the cover with its title, document number, date, and version. Each document shall include a document change page form and a document revision history. Each document shall be in hard and soft copy. Text is to be provided in camera-ready hardcopy format (1 copy) and CDROM in Microsoft Word 2000, PowerPoint, or PDF, as directed. Acceptable documentation format is PowerPoint Presentation with facing page text.

2.13 TASK AREAS

Specific technology areas of interest for this TD are listed in the four task areas defined in 3.0 through 6.0.

3.0 Task Area #1: SATELLITE AND LAUNCH SEGMENT DETAILED ANALYSIS

The development of satellite and launch architectures evolves through iterative analysis of the program objective, functional design criteria, program scope, technical performance requirements, proposed methods of performance (including acquisition strategy, drawings, process flow charts), and other technical documentation. The Respondent should attempt to identify the potential performance and cost benefits of their concepts for the instrument, spacecraft and launch strategy. If researching in this task area, the Respondent, at a minimum, should describe how the proposed design architecture addresses the following topics:

Satellite and Launch Segment Architecture Definition *(Equivalent to Space Located Segment)*

- The development of requirements and the comparison of these requirements with the capabilities of Satellites and Launch Services, which will be available to support a 2012 GOES-R, launch.
- Evaluate Space Segment architecture options to select the most promising architecture for further definition.
- Options shall include:
  - Government Notional Baseline Architecture (Distributed)
  - Consolidated Architecture
  - Other alternate architecture
- Spacecraft Definition
  - Identify mission unique modifications to support each architecture option
  - Provide spacecraft system budgets/margins, including volume, for each architecture option
- Provide instrument accommodation for each architecture option
- Provide suggested measures of effectiveness to be used to evaluate alternative architectures
- Assess architectural options against measures of effectiveness
- Reliability, Availability, Maintainability, and Sustainability to increase overall reliability
- Projected Design Life
- Rough Order of Magnitude Cost
- Assess risk of approaches
- Assess Launch Vehicle options to determine the optimum launch vehicle for the various architecture
  - Advantages and disadvantages for the single and dual spacecraft launch options
  - Mass and volume margins for the single and dual spacecraft launch options
  - Investigate risks associated with co-manifesting two satellites
  - Assess the design maturity and availability of the launch vehicle dual payload attach fitting (DPAF) or spacecraft stacked configuration
- Description of possible risks and how they will be managed

For the Respondent's recommended approach for the Overall Satellite and Launch Segment address topics below:

- Straw man Operational Concept
- Develop Satellite conceptual architecture that accommodate interface requirements
    - Review the requirements of all internal and external interfaces to the satellite, including instrument-to-Spacecraft interface requirements (General Interface Requirements Document (GIRD) and Unique Instrument Interface Documents (UIIDs))
    - Comment on Spacecraft Communication IRDs and identify architecture drivers
    - Assess the spacecraft-payload standard electrical and power interfaces defined in the GIRD
    - Assess GIRD/UIIDs disturbance requirements
- Replenishment strategy
- GOES-R Satellite and Launch Architecture evolution to the integrated architecture of the future NOSA and Global Communications Systems
- Technology Refreshment Strategy (Pre-Planned Product Improvement (P3I))
- Configuration block diagram for the segment, function sub-segments and interfaces, configuration description of the instrument interface with the space craft
- Description of the proposed calibration and validation concepts and procedures
- Description of proposed environmental compatibility concepts e.g. cleanliness, EMC, vibration, etc
- Recommended WBS and design schedule

4.0 Task Area #2: Command, Control and Communications (C^3) Segments

The C^3 Segments provide mission management, satellite operations, space/ground communications, and data routing for the life of the GOES R series missions. During planning, the requirements are developed, compared to needs, and refined. Requirements evolve through iterative analysis of the program objective, functional design criteria, program scope, technical performance requirements, proposed methods of performance (including acquisition strategy, drawings, process flow charts), and other technical documentation. The Respondent should attempt to identify the potential performance and cost benefits of their C^3 strategy. If researching in this task area, the Respondent, as a minimum, should describe how the proposed design architecture addresses the following topics:

- C^3 designs capable of meeting architecture requirements
- Concepts for command and control
- Recommended architectural trade studies
- Reliability, Availability, Maintainability, and Sustainability (RAMS)
- Projected design life
- Rough Order of Magnitude Cost
- Assess risk of approaches

For the Respondent's recommended approach for the C^3 Segment, address the topics below:

- Straw man Operational Concept
- Replenishment strategy
- Required data handling infrastructure
- Existing capabilities compared to the requirements of the mission (Identify new requirements compared to the heritage segments)
- Alternatives to the notional ground segment which use Wallops CDA and Fairbanks and Goddard Location
- Identify recommended new equipment or new technologies for GOES-R infrastructure (receiving stations, processing capabilities…) in relationship to the mission and the operational need
- Address the proposed frequency spectrum in terms of operating frequencies and bandwidth recommendations, and any limitations. Verify these recommendations are encompassed in the NOAA's submitted application with National Telecommunications Information Administration (NTIA). The application is available on the GOES-R Architecture Study web site
- Technology Refreshment Strategy (Pre Planned Product Improvements P3I)
- Required operations of the ground segment in relation to a Consolidated vs. Distributed Satellite Constellation

    - Manpower Impacts
    - Automation
    - Capability to manage multiple on-orbit assets
- End-to-end flow (block diagrams) to Payload data, Telemetry data, Command and Control data, and Segment Management data
- Processing requirements for instrument command, control and monitoring, data conditioning, including data compression approaches, encryption, denial, and possible pre-processing should be analysed. Assess flight vs ground processing and requirements for each.
- Allocation of C^3 resource requirements between space and ground
- Recommended WBS and development schedule

5.0 Task Area #3: PRODUCT GENERATION, DISTRIBUTION, ARCHIVE AND ACCESS AND USER INTERFACE SEGMENTS DETAILED ANALYSIS

The goal for Production Generation and Distribution, Archive, and Access and User Interface Segments is to archive and distribute NOAA environmental data, as well as, selected environmental data from other Government departments and agencies. During planning, requirements are developed, compared to needs, and refined. Requirements evolve through iterative analysis of the program objective, functional design criteria, program scope, technical performance requirements, proposed methods of performance (including acquisition strategy, drawings, process flow charts), and other technical documentation. The Respondent should attempt to identify the potential performance and cost benefits of its strategies to the Production Generation and Distribution, Archive, and Access and User Interface Segments. If researching in this task area, the Respondent, as a minimum, should describe how the proposed design architecture addresses the following topics:

- Production Generation and Distribution, Archive, and Access and User Interface Segments designs capable of meeting architecture requirements
- Recommended architectural trade studies
- Reliability, Availability, Maintainability, and Sustainability (RAMS)
- Projected design life
- Rough Order of Magnitude Cost
- Assess risk of approaches

For the Respondent's recommended approach address topics below:

- Straw man Operational Concept
- Replenishment strategy
- Required data handling infrastructure
- Processing of level 1B to level 2 and 3 products
- Communication for the dissemination of the data product
- Conceptual definition of communications infrastructure and corresponding data flow
- Define and analyze the data handling sub-segments, including data acquisition, processing, storage and user access/interface. Show structure in Block Diagram
- Identify interfaces and modifications to the CLASS archive and access sub-segment required to accept the data from the GOES-R Program
- Technology Refresh Strategy (Pre-Planned Product Improvement (P3I))
- Recommended WBS and development schedule

6.0 Task Area #4: End-To-End Integration

The planning of an end-to-end integrated system evolves through iterative analysis of the program objective, functional design criteria, program scope, technical performance requirements, proposed methods of performance (including acquisition strategy, drawings, process flow charts), and other technical documentation. The respondent should attempt to identify the potential performance and cost benefits of its strategies. If researching in this task area, the Respondent, at a minimum, should describe how the proposed design architecture addresses the following topics.

- End-To-End architecture to meet NOAA's requirement
- Provide suggested measures of effectiveness (MOE) to be used to evaluate alternative architectural proposals and use these MOE as part of the assessment
- Recommended Architectural trade studies
- GOES-R Reliability, Availability, Maintainability, and Sustainability
- Recommend how GOES-R design life can be extended
- Preliminary transition plan from the current system to the GOES-R System
- Rough Order of Magnitude Cost
- Recommend how operational flexibility can be increased
- Strategies for implementing a Level Funded System;
- Assessing Risk of approaches

For the contractor's recommended approach address the topics below:

- Straw man End-to-End Operational Concept
- GOES-R Architecture evolution to the integrated architecture of the future NOSA and Global Communications Systems
- Technology Refreshment Strategy for GOES-R (Pre-Planned Product Improvement (P3I))
- Resource allocations for such items as frequency, channels and bandwidth
- Recommended integrated communications and interfaces
    - External (e.g. TDRSS, DOMSAT…)
    - Internal (e.g.C^3…)
- Sustaining Engineering for the life of the on-orbit mission.
- Recommended WBS and development schedule

APPENDIX A: Acronym List

BAA	Broad Agency Announcement
CLASS	Comprehensive Large Array-Data Stewardship System
COTR	Contracting Officer's Technical Representative
COTS	Commercial Off The Shelf
DCP	Data Collection Platform
DPAF	Dual Payload Attach Fitting
GIRD	General Interface Requirements Document
GL-C^3S	GOES-R Ground Located-Command, Communications, and Control Segment
GOES	Geostationary Operational Environmental Satellite
GOES-R	GOES R Series
GRD	GOES-R Requirements Document
HVAC	High Voltage Alternating Current
LCC	Life Cycle Cost
MRD	Mission Requirements Document
NDI	Non Developmental Item
NESDIS	National Environmental Satellite, Data, and Information Services
NOAA	National Oceanic and Atmospheric Administration
NTIA	National Telecommunications Information Administration
NWS	National Weather Service
OAR	Office of Atmospheric Research
PM	Program Manager
POES	Polar Orbital Environmental Satellite
POP	Period of Performance
PRD	Preliminary Requirements Document
RAMS	Reliability, Availability, Maintainability and Sustainability
ROM	Rough Order of Magnitude
TD	Technical Description
TIM	Technical Interchange Meeting
TRL	Technical Review Level
UIID	Unique Instrument Interface Document
WBS	Work Breakdown System