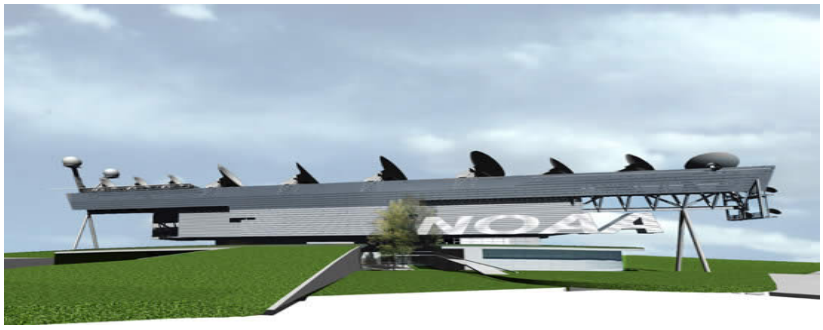
Environmental Satellite Processing Center (ESPC)



NPP and NPOESS Data Exploitation (NDE)

NDE System Requirements Specification

Version 1.0
August 2007

Prepared by:
U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)
Environmental Satellite Processing Center (ESPC)

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NPP and NPOESS Data Exploitation (NDE)

NDE Configuration Management Plan

August 2007

DRAFT

Prepared by:

U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)
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The document version number which also corresponds to the Document Control Number (DCN) identifies whether the document is a working copy, final, revision, or update, defined as follows:

- **Working copy or Draft: a document no**t yet finalized or ready for distribution; sometimes called a draft. Use 0.1A, 0.1B, etc. for unpublished documents.
- **Final:** the first definitive edition of the document. The final is always identified as Version 1.0.
- **Revision: a**n edition with minor changes from the previous edition, defined as changes affecting less than one-third of the pages in the document. The version numbers for revisions 1.1 through 1.9, 2.1 through 2.9, and so forth. After nine revisions, any other changes to the document are considered an update. A revision in draft, i.e. before be re-baselined should be numbered as 1.1, A, 1.1B, etc.
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DOCUMENT HISTORY

DOCUMENT REVISION LOG

The Document Revision Log identifies the series of revision to this Document since the baseline release. This page will become a permanent part of this document.

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LIST OF CHANGE-AFFECTED PAGES/SECTIONS/APPENDICES

Release #	Version #	Page___of__ page(s)	Date	Description of Change(s)	Item

Table of Contents

1 SCOPE

The purpose of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Data Exploitation (NDE) System Requirements Specification is to identify the system requirements that will support customer needs for products from the NPOESS Preparatory Project (NPP) satellite, as well as the NPOESS satellites that are part of the NPOESS program. These requirements also serve as the primary focal point for the traceability of all lower level or derived requirements documented in other NDE deliverables.

1.1 System Overview

NOAA's NPOESS Data Exploitation (NDE) system will receive data from the NPOESS Interface Data Processing Segment (IDPS), process and package it to meet user requirements, ensure appropriate NDE unique products are archived, distribute data to authorized users, and provide customer service to users of its products.
NDE's primary mission is to provide products derived from NPOESS observations to NOAA's operational and climate communities and to other civilian customers. In order to fulfill the mission, NDE will acquire the resources necessary to achieve the following objectives:

- Disseminate NPOESS Data Records from the IDPS to customers
- Generate and disseminate tailored NPOESS Data Records (versions of NPOESS Data Records in previously agreed alternative formats and views)
- Generate and disseminate NOAA-unique products (augmented environmental products constructed from NPOESS Data Records)
- Deliver NOAA-unique products and associated metadata to the NOAA's long term archive, the Comprehensive Large Array-data Stewardship System (CLASS)
- Provide services to customers, including a Help Desk, NDE product training, product enhancement, and implementation support across NOAA
- Coordinate NPOESS-related activities across NOAA -
  - Assist with planning for the implementation of NPOESS data by user systems -
  - Ensure end-user preparedness for NPOESS data
- Develop a sustainable system that meets its customer needs
- Provide software for NPOESS Data Record format conversion

In order to support these objectives, the NDE System will be partitioned into Operational (OPS), System Test (TEST), and Development (DEV) Environments. Each environment will be designed for a specific purpose for both the NPOESS Preparatory Project (NPP) era, as well as the NPOESS C1 and C2 eras.

1.2 Document Overview

The System Requirements Specification is based on the IEEE/EIA 12207 Standard for Software Life Cycle Processes published in 1995 by the Institute of Electrical and Electronics Engineers. This

document was created and published using the DOORS 7.1 automated requirements management tool.

1.3 Definitions

These definitions are used throughout the System Requirements Specification:

Component - refers to Hardware, equipment, and licensed software products (i.e., Operating Systems, DBMS, middleware, COTS or GOTS products, CASE tools, etc.), used in discussions of NDE infrastructure.

Element - refers to In-house developed capabilities (i.e., the source code for algorithms, programs, utilities, control tables, called procedures, etc.), used in discussions of NDE infrastructure.

Product Latency - The point in time when all of the required xDRs needed to create a product are successfully ingested and the point in time where the product is made available for distribution to customers.

System - refers to the assemblage of entity/objects comprising the whole of NDE, with each and every component/element interacting or related to at least one other component/element.

Tool - refers to a component used by the NDE development staff in the process of creating, testing, organizing, or tracking NDE components/elements, but not incorporated into the architecture of the operational or test systems (e.g., a requirements management tool).

1.4 Document Organization

Section 1 provides introduction and background information.

Section 2 lists the applicable and reference documentation.

Section 3 provides the formal requirements statements.

Section 4 provides the qualification provisions.

Section 5 contains traceability information.

2 REFERENCED DOCUMENTS

- OMB Federal Enterprise Architecture (FEA) http://www.whitehouse.gov/omb/egov/a-1-fea.htmlNOAA's
- NPOESS Data Exploitation Charter http://projects.osd.noaa.gov/nde
- NPOESS IPO, Integrated Operational Requirements Document II (IORD II), version 6, 2002.
- National Oceanic and Atmospheric Administration Information Quality Guidelines, September 30, 2002, http://www.noaanews.noaa.gov/stories/iq.htm
- Concept of Operations (CONOPS) for the National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Program, Version 1.2, September 15, 2003
- Comprehensive Large Array-data Stewardship System (CLASS) Archive, Access and Distribution System Allocated Requirements, Version 1
- Concept of Operations for the National Environmental Satellite, Data, and Information Service: 2010-2020, 2002
- National Oceanic and Atmospheric Administration (NOAA) Concept of Operations (CONOPS) For NPOESS Data Exploitation (NDE), Version 2.0, 08/03/05

3 REQUIREMENTS

3.1 Required States and Modes

3.1.1 Open Mode

The System shall provide the capability to operate in an **Open Mode**, within which authorized customers shall be allowed read-only access to requested Data Products. This is the nominal system mode.

3.1.2 Degraded System Mode

The System shall provide the capability to operate in a Degraded System Mode, within which the system generates a subset of products based upon priority and availability of system resources.

3.1.2.1 Degraded Data Notification

The System shall provide the capability to notify customers upon the NPOESS Ground System entering and leaving a Degraded Operations Mode.

3.1.3 Restricted Access Mode

The System shall provide the capability to operate in a **Restricted Access Mode**, within which only users meeting certain criteria will be authorized access to the data. Criteria will be defined in the TBD Data Denial Plan.

3.1.3.1 Restricted Access Notification

The System shall provide the capability to send an electronic notification to authorized users when they receive restricted access data.

3.2 Capability Requirements

3.2.1 Define Data Products

The System shall be capable of defining Data Products for Ingest.

3.2.2 Integrate System Elements

The System shall be capable of integrating System Elements including Scientific Algorithms, Product Tailoring Tools, Data Format Translation Tools, and other pre-defined transformation utilities.

3.2.3 Test Support

The System shall provide the capability to support functional and performance tests of system elements without impacting operational product generation.

3.2.4 Maintain Records of Data and System Elements

The System shall be capable of maintaining records of at least 30 days (configurable) worth of Ingest history.

3.2.5 Control Algorithm Execution

The System shall provide the capability to control the execution of Scientific Algorithms.

3.2.6 Data Product Generation

The System shall be capable of generating Data Products.

3.2.6.1 Data Product Priorities

The System shall provide the capability for an authorized user to adjust Product Generation priorities.

3.2.6.2 Platte Carre Projection

The System shall be capable of rendering Platte Carre projections.

3.2.6.3 Mercator Projection

The System shall be capable of rendering Mercator projections.

3.2.6.4 Polar Stereographic Projection

The System shall be capable of rendering Polar Stereographic projections.

3.2.6.5 Available Data Product Aggregations

The System shall be capable of aggregating Data Products up to and including one orbit.

3.2.6.6 Time-Averaged Data Products

The System shall be capable of producing time-averaged Data Products.

3.2.6.7 Available Grid Spacing

The System shall be capable of generating NOAA-Unique and Tailored Data Products with Government-specified grid spacing.

3.2.6.8 BUFR Data Format

The System shall be capable of reformatting Data Products into BUFR.

3.2.6.9 GRIB2 Data Format

The System shall be capable of reformatting Data Products into GRIB2.

3.2.6.10 GeoTIFF Data Format

The System shall be capable of reformatting Data Products into GeoTIFF.

3.2.6.11 HDF5 Data Format

The System shall be capable of reformatting Data Products into HDF5.

3.2.6.12 netCDF Data Format

The System shall be capable of reformatting Data Products into netCDF.

3.2.6.13 GZIP Compression Format

The System shall be capable of compressing Data Products with the GZIP algorithm.

3.2.6.14 ZIP Compression Format

The System shall be capable of compressing Data Products with the ZIP algorithm.

3.2.6.15 RICE Compression Format

The System shall be capable of compressing Data Products with the RICE algorithm.

3.2.6.16 JPEG Compression Format

The System shall be capable of compressing images of Data Products with the JPEG algorithm.

3.2.6.17 MPEG Compression Format

The System shall be capable of compressing animated images of Data Products with the MPEG algorithm.

3.2.6.18 Data Product Recovery

The System shall be capable of generating Data Products within a time frame not to exceed the maximum user-specified shelf-life of the Data Product.

3.2.7 Data Product Availability

The System shall be capable of making Data Products available to registered users.

3.2.7.1 User Subscription Requests

The System shall provide an online capability for registered users to request subscriptions to xDRs, Ancillary, NOAA-Unique, and Tailored Data Products.

3.2.7.2 Approve Subscription Requests

The System shall provide an online capability for the Government to approve subscription requests for xDRs, Ancillary, NOAA-Unique, and Tailored Data Products.

3.2.7.3 Archive NOAA-Unique Data Products

The System shall be capable of distributing NOAA-Unique Data Products to the CLASS Long-Term Archive (LTA).

3.2.7.3.1 Provide Manifest and File Reports to CLASS

The System shall provide a list of files distributed to CLASS.

3.2.7.4 Receipt from CLASS

The System shall provide the capability to receive an electronic delivery acknowledgement message from CLASS.

3.2.8 Data Delivery

The System shall be capable of delivering NDE Data Products to registered user's computer systems.

3.2.9 Order Status Notification

The System shall be capable of notifying registered users of the status of their orders.

3.2.10 System Status Notification

The System shall be capable of notifying registered users of the status of the System.

3.2.11 Data Authorization Procedures

The System shall ensure that NDE information is accessible only to those authorized to have access.

3.2.12 Customer Registration

The System shall be capable of registering Users for the purpose of controlling their access to System Elements and Data Products.

3.2.13 Health and Status

The System shall provide a mechanism for reporting performance related to resource utilization, communications, product latencies, and hardware.

3.2.14 Provide Automatic Failover

The System shall provide an automatic failover capability that will re-create a fully functioning configuration from a failed configuration.

3.2.14.1 OPS Failover to Test

In the event of a failure of the Operational Environment during the NPOESS missions, the System Test Environment shall be capable of delivering products to the operational community within the same throughput and latency parameters as the operational system.

3.2.15 Monitor Input Data Integrity

The System shall be capable of monitoring the integrity of all data received from external sources.

3.2.15.1 Define Data Integrity Checks

The System shall provide the capability for an authorized user to define data input integrity checks.

3.2.15.2 Execute Data Integrity Checks

The System shall be capable of executing and recording the results of data input integrity checks, and initiate actions based on those results.

3.2.16 Data Product Latency

The System shall be capable of making products available for distribution according to customer-

specified latencies.

3.2.17 Capture Performance Statistics

The System shall have the capability to monitor, record statistics, and deliver reports on its performance.

3.2.17.1 Performance Log Retention

The System shall be capable of retaining logs of all performance data for no less than 90 consecutive calendar days.

3.2.18 Generate Custom Reports

The System shall provide the capability to generate custom reports from data collected during data receipt, processing, and distribution.

3.3 External interface requirements

3.3.1 Receive from IDPS

The System shall be capable of receiving data and products from IDPS.

3.3.1.1 xDR Ingest from IDPS

The System shall be capable of requesting and accepting all xDRs generated by the IDPS.

3.3.1.2 SARSAT Telemetry from IDPS

The System shall be capable of receiving SARSAT Telemetry from the IDPS.

3.3.1.3 A-DCS Data and Telemetry from IDPS

The System shall be capable of receiving A-DCS data and telemetry from the IDPS.

3.3.1.4 Product Subscriptions to the IDPS

The System shall provide an operator console capable of utilizing IDPS client software for submitting subscriptions for Data Products to the IDPS.

3.3.1.5 Ad Hoc Requests to the IDPS

The System shall be capable of automatically submitting Ad Hoc Requests to the IDPS for retransmission of Data Products.

3.3.1.6 Data Delivery Notifications

The System shall be capable of receiving Data Delivery Reports (DDRs) from the IDPS.

3.3.2 Ancillary Data Product Acquisition

The System shall be capable of receiving Ancillary Data Products from the Environmental Satellite Processing Center (ESPC).

3.3.3 Process Archived Data

The System shall be capable of ingesting and processing archived data.

3.3.4 Receive from CLASS

The System shall provide an operator console capable of requesting Data Products from the Comprehensive Large Array-data Stewardship System (CLASS).

3.3.4.1 Data Products from CLASS

The System shall be capable of receiving Data Products delivered from CLASS.

3.3.4.2 Send CLASS Data Receipt

The System shall be capable of sending a Data Receipt to CLASS for each Data Product received from CLASS.

3.3.5 MMC Interface Through ESPC

ESPC Operations shall provide an interface between NDE and the NPOESS Mission Management Center (MMC) such that 100% of the NDE inquiries to the MMC and NDE replies to MMC requests are received by the MMC in a time not to exceed that specified in the ICD, and that 100% of the notifications and inquiries from the MMC to NDE are received by NDE in a time not to exceed that specified by the ICD.

3.3.6 NPOESS Trouble Ticket Interface

The System shall provide an operator console capable of interfacing with the NPOESS trouble ticketing system.

3.3.7 ESPC Trouble Ticket Interface

The System shall provide an operator console capable of interfacing with the ESPC trouble ticketing system.

3.4 Internal Interface Requirements

3.4.1 Schedule Tasks

The System shall be capable of executing tasks according to a schedule.

3.4.2 Event Driven Tasks

The System shall be capable of executing tasks initiated by events.

3.4.3 Reliability of Scheduled Tasks

The System shall be capable of executing 99% of its scheduled tasks in any consecutive 30 day period.

3.4.4 Reliability of Event Driven Tasks

The System shall be capable of executing 99% of its event driven tasks in any consecutive 30 day period.

3.4.5 Adjust Priorities of Tasks

The System shall be capable of adjusting the priorities of scheduled and event-driven tasks.

3.5 Internal data Requirements

3.5.1 Test Data Capacity

The System shall have the capacity to store 4 Terabytes (TBs) of data for testing purposes.

3.5.2 Metadata Standards Validation

The System shall be capable of reporting on all ingested, generated, and distributed data according to the (Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM), Vers. 2 (FGDC-STD-001-1998 <http://www.fgdc.gov/standards/projects/FGDC-standards-projects/metadata/base-metadata/index_html>) and the CSDGM Remote Sensing Extensions (FGDC-STD-012-2002).

3.5.3 Record Quality Information

The System shall be capable of storing product quality information in the metadata of products created.

3.5.4 NOAA-Unique Product Shelf Life

The System shall be capable of retaining Data Products for a configurable period of time not to exceed 96 hours.

3.6 Adaptation Requirements

3.6.1 Technology Updates

The System shall be capable of accepting technology updates without System downtime.

3.6.2 Scalability

The System shall be capable of adding additional capacity without redesign of it's infrastructure.

3.7 Security and Privacy Requirements

3.7.1 Follow ESPC Security Procedures

The System shall comply with ESPC (DoC/NOAA/NESDIS) procedures and policies as stated in the NOAA IT Security Manual 212-1300, Version 3.3, dated May 15, 2007.

3.7.2 Generate System Backups

The System shall be capable of generating backups for all NDE data, procedures, and software.

3.7.3 Identify Automated Backup Procedures

The System shall be capable of implementing automated backup procedures.

3.7.4 Restore from System Backups

The System shall be capable of returning to nominal operations following a restoration from system backups.

3.7.5 Integrity - Protect from Human Errors

The System shall be capable of protecting the integrity of NDE data in the event of human errors.

3.7.6 Integrity - Protect from Transmission Errors

The System shall be capable of protecting the integrity of NDE data in the event of computer to computer transmission errors.

3.7.7 Integrity - Protect from Software Bugs

The System shall be capable of protecting the integrity of NDE data from software bugs.

3.7.8 Integrity - Protect from Hardware Malfunction

The System shall be capable of protecting the integrity of NDE data in the event of a hardware malfunction such as a disk crash.

3.7.9 Integrity - Protect from Natural Disasters

The System shall be capable of protecting the integrity of NDE data in the event of a natural disaster.

3.7.10 ESPC Network Authorization

The NDE System can be accessed only with the authorization of the Government.

3.8 Computer Resource Requirements

3.8.1 Computer Hardware Requirements

3.8.1.1 Hardware Reuse

The System shall be constructed using existing hardware where it is possible, practical, and approved by the Government. Inventory will be provided to the Contractor by OSDPD IT Lead.

3.8.2 Computer software requirements

3.8.2.1 Software Reuse

The System shall be constructed using existing software where it is possible, practical, and approved by the Government. Inventory will be provided to the Contractor by OSDPD IT Lead.

3.8.2.2 COTS and Open Source

The System shall be constructed using COTS and Open Source software where it is possible, practical, and approved by the Government.

3.8.2.3 Reusability

The NDE System Elements shall be designed to be reused in other Satellite Data Processing applications.

3.8.2.4 Modularity

The NDE System shall be designed so that Scientific Algorithms are invoked as objects.

3.9 Operator-Related requirements

3.9.1 Log and Track Events

The System shall provide the capability for operators to log and track events (i.e., MMC Service Requests, MMC Service Request Responses).

3.9.2 Provide an Operator Log

The System shall provide the capability for operators to update a summary log for the purposes of tracking the occurrence of significant events or activities.

3.9.3 Sort/Search Operator Log

The System shall provide the capability for operators to sort and search on summary log events for the purposes of identifying, troubleshooting, and reporting on significant activities.

3.9.4 Report on Events

The System shall be capable of reporting on summary log events.

3.9.5 Restart Procedures

The System shall provide the capability for operators to quiesce and restart the System. This capability should be designed to minimize interruptions of service.

3.9.6 Monitor Input Quality

The System shall implement operational quality monitoring procedures that will detect and report to operators and management the acceptability of xDR metadata according to configurable thresholds.

3.9.7 Monitor Output Quality

The System shall implement operational quality monitoring procedures that will detect and report to operators and management the acceptability of output product metadata according to configurable

thresholds.

3.9.8 Degraded Operations Notification

The System shall be capable of changing system status to reflect the condition of NPOESS (i.e., Degraded Operations, Restricted Access).

3.9.9 Archive System Elements

The System shall provide the capability for operators to forward NDE System Elements to CLASS for permanent archive.

3.10 Other Requirements

3.10.1 Availability Requirements

3.10.1.1 Ingest Availability

The NDE Ingest capability shall not be interrupted for more than 2 hours in any consecutive 24 hour period and no more than 4 hours in any consecutive 30 day period.

3.10.1.2 Product Generation Availability

The NDE Product Generation capability shall not be interrupted for more than 2 hours in any consecutive 24 hour period and no more than 4 hours in any consecutive 30 day period.

3.10.1.3 Distribution Availability

The NDE Distribution capability shall not be interrupted for more than 2 hours in any consecutive 24 hour period and no more than 4 hours in any consecutive 30 day period.

3.10.1.4 Operations Monitoring Availability

The NDE Operations Monitoring capability shall not be interrupted for more than 2 hours in any consecutive 24 hour period and no more than 4 hours in any consecutive 30 day period.

3.10.1.5 Interruptions to Development

The Development and Maintenance Environment shall be available to at least 25 developers 85% of the time during normal business hours over any consecutive twelve month period. Normal business hours are 8am to 4pm Eastern Time, Monday through Friday.

3.10.2 Performance Requirements

3.10.2.1 IDPS Data Access Latency

The System shall be capable of accessing data delivered by IDPS within no more than ten seconds of notification from IDPS.

3.10.2.2 SARSAT Telemetry

The System shall deliver SARSAT Telemetry data from IDPS to US Mission Control Center

(USMCC) within 1 minute of their receipt.

3.10.2.3 A-DCS Telemetry

The System shall deliver A-DCS Telemetry data from IDPS to the US Global Processing Center within 1 minute of their receipt.

3.10.2.4 A-DCS Data

The System shall deliver A-DCS Data Products from IDPS to the US Global Processing Center within 1 minute of their receipt.

3.10.3 Capacity Requirements

3.10.3.1 NPP Era Product Volumes

During the NPP mission, the System shall be capable of supporting product volumes of 4 Terrabytes per day of input and 8 Terabytes per day of output.

3.10.3.2 NPOESS-C1 Era Product Volumes

During the NPOESS-C1 mission, the System shall be capable of supporting product volumes of 8 Terabytes per day of input and 16 Terrabytes per day of output.

3.10.3.3 NPOESS-C2 Era Product Volumes

During the NPOESS-C2 mission, the System shall be capable of supporting product volumes of 8 Terabytes per day of input and 16 Terabytes per day of output.

3.10.4 Federal Enterprise Architecture

The System shall be compliant with the OMB Federal Enterprise Architecture (FEA) according to the documents dated December 2006, and available from http://www.whitehouse.gov/omb/egov/a-2-EAModelsNEW2.html .

4 REQUIREMENTS TRACEABILITY

4.1 NDE Contract Section J

The Section J portion of the NDE Contract specifies NDE System requirements in terms of Desired Outcomes, Required Services, Performance Standards, and Monitoring Methods. These requirements have been used as a basis for the SRS items in the Section 4.2 Traceability Table. All applicable portions of NDE Contract Section J are located in Appendix C.

4.2 Traceability Table

ID	Object Number	Object Heading	Sec J Reqt	Subsystem
SRS79	3.1.1	Open Mode	SM12	Infrastructure
SRS80	3.1.2	Degraded System Mode	SM15	Infrastructure
SRS95	3.1.2.1	Degraded Data Notification	SM16	Infrastructure
SRS81	3.1.3	Restricted Access Mode	SM13	Infrastructure
SRS96	3.1.3.1	Restricted Access Notification	SM14	Customer Services
SRS76	3.2.1	Define Data Products	PG8	Ingest
SRS77	3.2.2	Integrate System Elements	PG8	Product Management
SRS99	3.2.3	Test Support	SE3	Production
SRS100	3.2.4	Maintain Records of Data and System Elements	DA7	Production
SRS73	3.2.5	Control Algorithm Execution	PG8	Production
SRS74	3.2.6	Data Product Generation	PG8	Production
SRS306	3.2.6.1	Data Product Priorities		
SRS101	3.2.6.2	Platte Carre Projection	PG5	Production
SRS254	3.2.6.3	Mercator Projection	PG5	Production
SRS255	3.2.6.4	Polar Stereographic Projection	PG5	Production
SRS102	3.2.6.5	Available Data Product Aggregations	PG6	Production
SRS256	3.2.6.6	Time-Averaged Data Products	PG6	Production
SRS103	3.2.6.7	Available Grid Spacing	PG7	Production
SRS105	3.2.6.8	BUFR Data Format	PG1	Production
SRS257	3.2.6.9	GRIB2 Data Format	PG1	Production
SRS258	3.2.6.10	GeoTIFF Data Format	PG1	Production
SRS259	3.2.6.11	HDF5 Data Format	PG1	Production
SRS260	3.2.6.12	netCDF Data Format	PG1	Production
SRS108	3.2.6.13	GZIP Compression Format	PG3,	Production

ID	Object Number	Object Heading	Sec J Reqt	Subsystem
			PG4	
SRS262	3.2.6.14	ZIP Compression Format	PG3, PG4	Production
SRS264	3.2.6.15	RICE Compression Format	PG3, PG4	Production
SRS261	3.2.6.16	JPEG Compression Format	PG3, PG4	Production
SRS263	3.2.6.17	MPEG Compression Format	PG3, PG4	Production
SRS114	3.2.6.18	Data Product Recovery	DA9	Production
SRS117	3.2.7	Data Product Availability	CD6	Distribution
SRS209	3.2.7.1	User Subscription Requests	CD6	Distribution
SRS265	3.2.7.2	Approve Subscription Requests	CD6	Distribution
SRS119	3.2.7.3	Archive NOAA-Unique Data Products	DA6, XF5	Distribution
SRS246	3.2.7.3.1	Provide Manifest and File Reports to CLASS	XF5	Distribution
SRS210	3.2.7.4	Receipt from CLASS	XF7	Distribution
SRS118	3.2.8	Data Delivery	I2	Distribution
SRS120	3.2.9	Order Status Notification	SM19	Distribution
SRS266	3.2.10	System Status Notification	SM19	Monitoring and Control
SRS186	3.2.11	Data Authorization Procedures	SM10	Monitoring and Control
SRS212	3.2.12	Customer Registration	SM10	Customer Services
SRS128	3.2.13	Health and Status	SM5	Monitoring and Control
SRS87	3.2.14	Provide Automatic Failover	DD5	Monitoring and Control
SRS130	3.2.14.1	OPS Failover to Test	I2	Monitoring and Control
SRS131	3.2.15	Monitor Input Data Integrity	SM18	Monitoring and Control
SRS307	3.2.15.1	Define Data Integrity Checks	SM17, SM18	
SRS268	3.2.15.2	Execute Data Integrity Checks	SM18	Monitoring and Control
SRS133	3.2.16	Data Product Latency	CD9	Monitoring and Control
SRS134	3.2.17	Capture Performance Statistics	SM23	Monitoring and Control

ID	Object Number	Object Heading	Sec J Reqt	Subsystem
SRS303	3.2.17.1	Performance Log Retention	SM24	Monitoring and Control
SRS302	3.2.18	Generate Custom Reports	SM24	Monitoring and Control
SRS56	3.3.1	Receive from IDPS	PG8	Ingest
SRS57	3.3.1.1	xDR Ingest from IDPS	PG8	Ingest
SRS62	3.3.1.2	SARSAT Telemetry from IDPS	XF1	Ingest
SRS63	3.3.1.3	A-DCS Data and Telemetry from IDPS	XF1	Ingest
SRS58	3.3.1.4	Product Subscriptions to the IDPS	XF1	Ingest
SRS59	3.3.1.5	Ad Hoc Requests to the IDPS	XF1	Ingest
SRS60	3.3.1.6	Data Delivery Notifications	XF1	Ingest
SRS61	3.3.2	Ancillary Data Product Acquisition	PG9	Ingest
SRS191	3.3.3	Process Archived Data	DA9	Product Generation
SRS65	3.3.4	Receive from CLASS	XF7	Ingest
SRS66	3.3.4.1	Data Products from CLASS	XF7	Ingest
SRS70	3.3.4.2	Send CLASS Data Receipt	XF7	Ingest
SRS140	3.3.5	MMC Interface Through ESPC	XF9	Infrastructure
SRS142	3.3.6	NPOESS Trouble Ticket Interface	XF11	Infrastructure
SRS235	3.3.7	ESPC Trouble Ticket Interface	SM16	Infrastructure
SRS143	3.4.1	Schedule Tasks	SM2	Production
SRS282	3.4.2	Event Driven Tasks	SM2	Production
SRS283	3.4.3	Reliability of Scheduled Tasks	SM2	Production
SRS284	3.4.4	Reliability of Event Driven Tasks	SM2	Production
SRS145	3.4.5	Adjust Priorities of Tasks	SM3	Production
SRS285	3.5.1	Test Data Capacity	DA2	System
SRS286	3.5.2	Metadata Standards Validation	DA10	Monitoring and Control
SRS287	3.5.3	Record Quality Information	DA11	Monitoring and Control
SRS154	3.5.4	NOAA-Unique Product Shelf Life	DA1	Distribution
SRS158	3.6.1	Technology Updates	I1	Infrastructure
SRS159	3.6.2	Scalability	I1	Infrastructure
SRS160	3.7.1	Follow ESPC Security Procedures	SA5	Documentation Security

ID	Object Number	Object Heading	Sec J Reqt	Subsystem
SRS162	3.7.2	Generate System Backups	SM7	Infrastructure
SRS183	3.7.3	Identify Automated Backup Procedures	SM7	Infrastructure
SRS163	3.7.4	Restore from System Backups	SM9	Security
SRS288	3.7.5	Integrity - Protect from Human Errors	SM9	Monitoring and Control
SRS289	3.7.6	Integrity - Protect from Transmission Errors	SM9	Monitoring and Control
SRS290	3.7.7	Integrity - Protect from Software Bugs	SM9	Monitoring and Control
SRS291	3.7.8	Integrity - Protect from Hardware Malfunction	SM9	Monitoring and Control
SRS198	3.7.9	Integrity - Protect from Natural Disasters	SM9	Infrastructure
SRS164	3.7.10	ESPC Network Authorization	CD4	Networks
SRS166	3.8.1.1	Hardware Reuse	SE9	Infrastructure
SRS167	3.8.2.1	Software Reuse	SE9	Infrastructure
SRS93	3.8.2.2	COTS and Open Source	SE10	Infrastructure
SRS168	3.8.2.3	Reusability	SE2	Infrastructure
SRS169	3.8.2.4	Modularity	SE5	Infrastructure System
SRS177	3.9.1	Log and Track Events	SM20	Monitoring and Control
SRS293	3.9.2	Provide an Operator Log	SM23	Monitoring and Control
SRS294	3.9.3	Sort/Search Operator Log	SM24	Monitoring and Control
SRS178	3.9.4	Report on Events	SM24	Monitoring and Control
SRS184	3.9.5	Restart Procedures	SM8	Infrastructure
SRS187	3.9.6	Monitor Input Quality	SM17	Monitoring and Control
SRS295	3.9.7	Monitor Output Quality	SM18	Monitoring and Control
SRS188	3.9.8	Degraded Operations Notification	SM16	Monitoring and Control
SRS189	3.9.9	Archive System Elements	DA4, XF6	Distribution Infrastructure
SRS193	3.10.1.1	Ingest Availability	AS1	Distribution Infrastructure
SRS296	3.10.1.2	Product Generation Availability	AS1	Distribution Infrastructure

ID	Object Number	Object Heading	Sec J Reqt	Subsystem
SRS297	3.10.1.3	Distribution Availability	AS1	Distribution Infrastructure
SRS298	3.10.1.4	Operations Monitoring Availability	AS1	Distribution Infrastructure
SRS91	3.10.1.5	Interruptions to Development	SE3	Infrastructure
SRS194	3.10.2.1	IDPS Data Access Latency	I2	Infrastructure Ingest
SRS196	3.10.2.2	SARSAT Telemetry	CD7	Distribution Infrastructure Ingest
SRS197	3.10.2.3	A-DCS Telemetry	CD8	Distribution Infrastructure
SRS301	3.10.2.4	A-DCS Data	CD8	Distribution Infrastructure
SRS86	3.10.3.1	NPP Era Product Volumes	I2	Distribution Infrastructure Ingest Monitoring and Control System
SRS299	3.10.3.2	NPOESS-C1 Era Product Volumes	I2	Distribution Infrastructure Ingest Monitoring and Control
SRS300	3.10.3.3	NPOESS-C2 Era Product Volumes	I2	Distribution Infrastructure Ingest Monitoring and Control
SRS92	3.10.4	Federal Enterprise Architecture	SE1	Documentation Infrastructure

APPENDIX A: Glossary

The following table is from the NDE Glossary (Draft) dated 20-Mar-2007, with several additions. The Terms below are reference in the System Requirements Specification as well as other NDE documents.

Term	Definition
Activity Diagram	An activity diagram represents the business and operational step-by-step workflows of components in a system.
A-DCS	Advanced Data Collection System
Application Server	An application server is a software engine that delivers applications to client computers. Moreover, an application server should handle most, if not all, of the business logic and data access of the application.
CASE	Computer-Aided Software Engineering
CLASS	Comprehensive Large Array-data Stewardship System
Component	Hardware, equipment, and licensed software products (i.e., Operating Systems, DBMS, middleware, COTS or GOTS products, CASE tools, etc.), used by NDE as general term in discussions of infrastructure (See Contract Section J, Figure 38.)
Continuance of Operations Plan (COOP)	A conducted three months study starting in February 2007 to evaluate options for a NDE backup facility.
Critical Infrastructure Protection (CIP)	Infrastructure necessary to backup the NDE system.
Delivered Algorithm Package (DAP)	The DAP is a single compressed tar file which contains all information necessary so that an algorithm can be built from scratch and tested independently of other algorithms in the NDE development and test environments.
Drop Box	A file directory or set of directories located on a system within a designated public security zone on the network which is configured to segregate access and provide a place to deliver and receive files necessary for other systems to process. The drop box sometimes refers to the hosting system or hosting system's file system.
Element	NOAA-developed system capabilities (e.g., the source code for algorithms, programs, utilities, control tables, called procedures, etc.), used by NDE as general term in discussions of archiving and configuration management (See Contract Section J, Figure 38.)
Enterprise Service Bus (ESB)	An ESB refers to a software architecture construct that provides foundational services for more complex architectures via an event-driven and standards-based messaging engine (the bus). The ESB is in the category of middleware infrastructure products.
Gazetteer	A gazetteer is a geographical dictionary: Short-form gazetteers, often used in conjunction with computer mapping and Geographic Information Systems (GIS), may simply contain a list of place-names together with their locations in latitude and longitude or other spatial referencing systems (eg. British National Grid reference).
Middleware	Middleware is computer software that connects software components or applications. It is used most often to support complex, distributed applications. It includes web servers, application servers, content management systems, and similar tools that support application

Term	Definition
	development and delivery.
Near Real-Time Process	Software process designed to satisfy a latency requirement that calls for the process to be completed within 30 minutes or less time that all input data becomes available for that process.
NOFORN	Not Releasable to Foreign Nationals/Governments/Non-US Citizens
Production Rule	Production Rules define the activation conditions necessary for an algorithm to be run.
Product Latency	The point in time when all of the required xDRs needed to create a product are successfully ingested and the point in time where the product is made available for distribution to customers.
SARSAT	Search and Rescue Satellite-aided Tracking
Science Algorithm Development and Integration Environment (SADIE)	The SADIE is a computing environment where algorithms are integrated with the Data Handling System (DHS). It contains all the tools and libraries necessary to design, develop, and do unit testing on algorithms. It also can receive algorithms that were developed in other environments (e.g., the STAR Collaborative Environment) via the delivery of a Delivered Algorithm Package (DAP).
Service	A service is a unit of work done by a service provider for a service consumer.
Service Oriented Architecture (SOA)	SOA is an architectural style whose goal is to achieve loose coupling among interacting software agents. (Source: from Wikipedia) An architecture that relies on service-orientation as its fundamental design principle. Service-orientation describes an architecture that uses loosely coupled services to support the requirements of business processes and users. Resources on a network in an SOA environment are made available as independent services that can be accessed without knowledge of their underlying platform implementation. These concepts can be applied to business, software and other types of producer/consumer systems.
STAR	Center for Satellite Applications and Research
Subsystem	A subsystem is a set of elements, which is a system itself, and a part of the whole system.
System	A system is an assemblage of entity/objects comprising a whole with each and every component/element interacting or related to at least one other component/element. Any object which has no relationship with any other element of the system is not a component of that system.
Tool	Component used by NDE development staff in the process of creating, testing, organizing, or tracking NDE elements, but not incorporated into the architecture of the operational or test systems (e.g. a requirements management tool).
Use Case	A use case is a technique for capturing functional requirements of systems. Each use case provides one or more scenarios that convey how the system should interact with the users, called actor, to achieve a specific business goal or function.
Use Case Actors	End users or other systems.
Use Case Diagram	Use Case Diagrams model the behavior of a system, subsystem, or class.
Virtual Private Network (VPN)	A VPN is a private communications network often used within a company, or by several companies or organizations, to communicate confidentially

Term	Definition
	over a publicly accessible network. VPN message traffic can be carried over a public networking infrastructure (e.g. the Internet) on top of standard protocols, or over a service provider's private network with a defined Service Level Agreement (SLA) between the VPN customer and the VPN service provider. (Source: Wikipedia) For NDE, the VPN is used to authorize roles and access to each user, encrypt the traffic between the user's system and the NDE systems accessed, and provide strong authentication capabilities for the users.
Web Server/HTTP Server	Software accepting HyperText Transfer Protocol (HTTP) requests from clients, which are known as Web browsers, and serving them HTTP responses along with optional data contents, which usually are Web pages such as HTML documents and linked objects (images, etc.).

APPENDIX B: Acronyms and Abbreviations

The following table is from the NDE Concept of Operations (Draft) document dated 7-Nov-2007. The acronyms below are reference in the CONOPS document as well as other NDE documents.

ADA	(IDPS) Algorithm Development Area
A-DCS	Advanced Data Collection System
AFWA	Air Force Weather Agency
API	Application Program Interface
APS	Aerosol Polarimeter Sensor
ATMS	Advanced Technology Microwave Sounder
AWIPS	Advanced Weather Interactive Processing System
C1	Converged Satellite 1 (First NPOESS Satellite)
C2	Converged Satellite 2 (Second NPOESS Satellite)
C3	Converged Satellite 3 (Third NPOESS Satellite)
C3S	Command, Control, and Communications Segment
CASE	Computer Assisted Software Engineering
CDR	Climate Data Records
CDR	Critical Design Review
CE	Capital Expenses
CLASS	Comprehensive Large Array-data Stewardship System
CM	Configuration Management
CMIS	Conical Scanning Microwave Imager/Sounder
CO	Contract Officer
CONOPS	Concept of Operations
COOP	Continuity of Operations Plan
COR	Contract Officer Representative
COTS	Commercial off-the-shelf
CM	Configuration Management
CrIS	Cross-Track Infrared Sounder
CrIMS	Cross-Track Infrared Sounder + Advance Technology Microwave Sounder
DBA	Data Base Administrator
DBMS	Data Base Management System
DCS	Data Collection System
DHS	Data Handling System
DMSP	Defense Meteorological Satellite Program

DoA	Department of Agriculture
DOC	Department of Commerce
DoD	Department of Defense
DOS	Department of State
DRO	Direct Readout
ECMWF	European Center for Medium-range Weather Forecasting
EDR	Environmental Data Record
EOS	Earth Observing System (NASA)
ERD	Entity Relationship Diagram
ESPC	Environmental Satellite Processing Center
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FAA	Federal Aviation Administration
FGDC	Federal Geographic Data Committee
FNMOC	Fleet Numerical Meteorology and Oceanography Center
FOC	Final Operational Capability
GOTS	Government off-the-shelf
HDF	Hierarchical Data Format
HDF5	Hierarchical Data Format version 5
I&T	Integration and Test
IDPS	Interface Data Processing Segment
IORD-II	Integrated Operational Requirements Document
IPO	Integrated Program Office
IPP	Integrated Program Plan
ITAT	Information Technology Architecture Team
JARG	Joint Agency Requirements Group
JCSDA	Joint Center for Satellite Data Assimilation
KPP	Key Performance Parameter
LTA	Long-term Archive
LUT	LUT (Local User Terminal)
METOP	Meteorological Operational
MMC	Mission Management Center
NAVOCEANO	Naval Oceanographic Office
NCDC	National Climatic Data Center
NCEP	National Centers for Environmental Prediction
NDE	NPOESS Data Exploitation
NEB	NOAA Executive Board
NGDC	National Geophysical Data Center
NIC	National Ice Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration

NODC	National Oceanographic Data Center
NOS	National Ocean Service
NPOESS	National Polar-orbiting Operational Environmental Satellite System
NPP	NPOESS Preparatory Project
NSOF	NOAA Satellite Operations Facility
NU	NOAA Unique
NUP	NOAA Unique Product
NWS	National Weather Service
O&M	Operations and Maintenance
OAR	Office of Oceanic and Atmospheric Research
OMB	Office of Management and Budget
OPC	Ocean Prediction Center
OSD	Office of Systems Development
OSDPD	Office of Satellite Data Processing and Distribution
PAL	Product Area Lead
PD	Product Development
PDR	Preliminary Design Review
PIR	Post Implementation Review
POES	Polar-orbiting Operational Environmental Satellite
POP	Product Oversight Panel
PPBES	Project Planning, Budgeting, and Evaluation System
PPI	Plan For Product Implementation
PPI	Program Planning and Integration
PSDI	Product Systems Development and Implementation
R2O	Research To Operations
RDBMS	Relational Data Base Management System
RDR	Raw Data Record
RTS	Requirements Tracking System
SADIE	Science Algorithm Development and Integration Environment (SADIE)
SARSAT	Search and Rescue Satellite Aided Tracking
SDLC	System Development Life Cycle
SDR	Sensor Data Record
SDS	Scientific Data Stewardship
SDS	Science Data Segment (NASA)
SMB	Senior Management Board
SMD	Stored Mission Data
SPSRB	Satellite Product and Services Review Board
SRR	System Requirements Review
SST	Sea-Surface Temperature
STAR	Center for Satellite Applications and Research

STI	Science and Technology Infusion
SUAG	Senior Users Advisory Group
TBC	To Be Confirmed
TDR	Temperature Data Record
UKMetO	United Kingdom Meteorology Office
USMCC	United States Mission Control Center
VIIRS	Visible/Infrared Imager Radiometer Suite
WBS	Work Breakdown Structure
xDR	any NPOESS Data Record

APPENDIX C: Section J Contract Matrices

Table 3. NDE Software Engineering Outcomes Matrix

	Desired Outcomes	Required Service	Performance Standard	Monitoring Method
SE1	The ESPC will have an IT Architecture compliant with government standards and that meets NESDIS requirements.	The contractor shall develop an IT Enterprise Architecture (EA) that is consistent with "Table 1 Federal Enterprise Architecture (FEA)." (NOTE: Guidance on applying the FEA to NDE Design is available at the FEA web site: **http://www.whitehouse.gov/omb/egov/a-1-fea.html**	The IT Enterprise Architecture (EA) will be compliant with the OMB Federal Enterprise Architecture (FEA). The EA will also be compliant with guidance from the NESDIS CIO's Office. EA will include documentation in Table 1.	~Analysis of designs
SE2	Lower the cost and risks of **operating** the systems that will generate and distribute NPOESS-derived products to customers	**Design Requirement A: Design an Operational Environment**The contractor shall design and provide a reliable cost estimate of an NDE product processing system (develop a set of diagrams and supporting text) with an open architecture, such that its capabilities can be executed by other satellite data processing applications and can easily be operated on	**Open Architecture:** During the first year of the contract, prior to coding, the contractor shall develop a set of diagrams and supporting text that describes NDE product processing in the context of all NESDIS data processing missions.**Reusability:** During the first year of the contract, prior to	~Analysis of designs

		other platforms. Capabilities that must be specified in this design include, but are not limited to:- Database management systems (DBMS)- Work management and scheduling systems- Libraries - Object repositories- Object repository content Shared data objects (i.e., lookup tables, ancillary data) Shared procedural objects (i.e., utilities, called-modules, subroutines, etc.)	coding, the contractor shall provide a set of diagrams and supporting text that describes an NDE product processing system in which the maximum number of system elements are accessible by the greatest possible number of product processing applications.**Reliability:** The NDE operational environment will be designed for a high degree of reliability- maintain full operational status 98% of the time over any 12 month period.**Performance:** The NDE operational environment will be designed for optimal resource utilization**Security:** The NDE operational environment will be designed for a high degrees of confidentiality, integrity, and availability	
SE3	Lower the cost and	**Design Requirement**	**Open**	~Analysis of

	risks of **developing, maintaining, and enhancing** the system's data processing and scientific capabilities	**B: Design a Development Environment**Specify and provide a reliable cost estimate of a shared, scalable infrastructure for use by developers and maintainers of data processing functions and of scientific algorithms that replicates, to the greatest extent possible, the system described as fulfillment of Design Requirement A (above). As well, the Development Environment Design will specify a suite of proven development life cycle **tools to enhance NESDIS capabilities** in performing developmental and software maintenance tasks. Technologies in this category are: CASE tools, modeling tools, 4th Generation Languages, Testing Tools, requirements tracking tools, etc..	**Architecture**: During the first year of the contract, prior to coding, the contractor shall develop a set of diagrams and supporting text that describes NDE development capabilities in the context of all NESDIS data processing missions. **Reusability:** During the first year of the contract, prior to coding, the contractor shall provide a set of diagrams and supporting text that describes a developmental IT infrastructure in which developmental resources (tables, CASE tools, 4GLs, utilities, compilers, the maximum number of system elements can be accessed by environmental satellite product developers. **Performance:** The NDE development	designs

			environment will be designed for optimal resource utilization	
			Maintainability: Thecontractor provides a set of recommendations for the most appropriate development tools demonstrating that they are:~ widely supported in the remote sensing software industry ~ the most likely to be known by future NESDIS support staff **Reliability:** The NDE development environment will be designed for a high degree of reliability - accessible to no less than 100 developers 95% of the time over any 12 month period **Security:** The NDE development environment will be designed for a high degrees of confidentiality, integrity, and availability **Partitioning:** The NDE	

			development environment will be designed to support segregated domains to support different levels of testing (e.g.; unit, string, etc.)	
SE4	Lower the cost and risks of **transitioning system elements into operations**	**Design Requirement C: Design a System Test Environment** Specify and provide a reliable cost estimate of a segregated test capability that replicates, to the greatest extent possible, the system described as fulfillment of Design Requirement A (above). The System Test Environment must support the following: Provide a capability for products to be generated and distributed to customers throughout the NPP mission. (NOTE: The System Test environment will be used to generate NPP products for customers as "quasi-operational.") Evaluate candidate system elements for operational fitness, performing	**Ease of Use, Efficiency, Manageability:** During the first year of the contract, prior to coding, the contractor shall provide a set of diagrams, supporting text, and procedures that describe a System Test Environment to be administered and operated in such a way that all elements submitted to them for testing and review can be evaluated for operational fitness in less than five working days after submission by developers.	~Analysis of System Test Designs

		appropriate - Analysis of documentation in terms of conformity to Configuration Management Standards (tbd) - Parallel tests - Stress Tests - Regression Tests Cooperate with NESDIS algorithm developers to identify System Test procedures, standards, and the criteria to be applied in determining a system element's fitness for operational status		
		Provide a reliable, easily accessible source of information to developers about the criteria that will be applied by the System Test team to determine a system element's fitness for operational status. This information will include, at a minimum: system test submission procedures, documentation requirements, test script requirements, test scenario requirements, and test data requirements.		
SE5	Ability to isolate, alter, and test the	The contractor shall develop the data	**Modularity:** During the	~Analysis of designs

	system functions	processing elements of the future system in such a way that algorithms are invoked as objects with hidden information.	project, prior to coding, the contractor shall provide a set of diagrams and supporting text that describes how algorithms are to be invoked as objects	

SE6	The contractor's design shall meet IT security standards (see System Management Requirements G through J)	The contractor shall provide documentation needed for Information System Certification and Accreditation.	Documentation is complete and high quality. Documentation includes IT Security Plan, Risk Assessment, Security Test and Evaluation Plan, and Contingency Plan.	~Analysis of designs
SE7	ESPC is built according to government standards and Maturity Models.	The contractor shall use Government Maturity Models for Configuration Control of documentation, Information System components, EA, and IT Security.	CM, EA, and IT Security conform with accepted Government Level 4 Maturity Models.	~Analysis of designs
SE8	Costs are reduced and system transition is easier.	The contractor shall design and build the NDE Information System using NOAA IT Best Practices provided by NDE Project Manager.	Technical Reference Model is compared to NDE collection of NOAA Best Practices.	~Analysis of designs
SE9	The use of existing hardware and software reduces cost.	The contractor shall use existing hardware and software where it is possible, practical, and approved by the Government. Inventory will be provided to the contractor by OSDPD IT	Design documentation identifies existing hardware and software used.	~Analysis of designs

		Lead.		
SE10	Vendor-supported COTS and Open Source software is used to reduce development costs.	The contractor shall use Commercial-Off-the-Shelf (COTS) and Open Source software packages where practical, possible, and approved by the Government.	Design documentation identifies COTS used.	~Analysis of designs
SE11	Ability to **make system management decisions** on the basis of system-generated metrics	The contractor shall identify standard measures of automated system component performance that can be captured during run-time and retrieved for analysis	**Measurability:** During the project, prior to coding, the contractor shall provide diagrams and supporting text describing:~ numerical data elements of execution performance (time, volume, number of invocations, etc.)~ how the performance metrics are to be stored and used for reporting	~Analysis of designs
SE12	Effectively manage design and development of the system's data processing capabilities	**Project Management Requirement:** The contractor shall plan and control the NDE project in a manner that is consistent with a widely accepted software engineering methodology.	**Manageability:** The contractor:~ Shall identify the widely accepted software engineering methodology to be used on the project~ Shall develop and maintains Work Breakdown Structures and Project Plans consistent with the Methodology ~ Shall create work products consistent	~Status Reporting

with those described by the methodology

			with those described by the methodology ~ Shall report project status in terms of the likelihood that methodology-defined deliverables will be provided on schedule.	
SE13	Effectively maintain the system's data processing components with a pool of readily available software engineers.	The contractor shall develop the data processing elements of the future NDE system using the latest proven technologies (programming languages, CASE tools, object repositories, data base management systems, etc.) that are appropriate for remote sensing data processing.	**Maintainability: As early as possible during the Design Project, t**he contractor shall provide a set of recommendations for the most appropriate development tools demonstrating that they are:~ widely supported in the remote sensing software industry ~ the most likely to be known by future NESDIS support staff	~Analysis of Recommendations
SE14	Effectively manage maintenance and enhancements of the system's data processing capabilities	The contractor shall develop the data processing elements of the future NDE system using tools that will support the ability to alter executable components without altering source code.	**Maintainability:** Prior to coding, the contractor shall develop a set of recommendations for the development tools (4^{th} generation programming languages, integrated CASE tools, object	~Analysis of designs

			repositories, data base management systems, etc.) that will promote, to the greatest extent possible, the ability to alter executable elements without altering source code.	

Table 4. NDE System Management Outcomes Matrix

	Desired Outcomes	Required Service	Performance Standard	
NOTE: Unless specifically named as applicable to one or two environments (Operations, Development, or System Test) all System Management requirements are applicable to each of the 3 environments described in Software Engineering Design Requirements A, B, and C.				
SM 1	The system management processes will improve continuously	**System Management Requirement A:**The contractor's system management capabilities shall be evaluated in terms of Software Engineering Institute's (SEI) Capability Maturity Model (CMM)	**Software Management Capability:** Certified CMM Level 2 during proposal evaluation, Certified CMM Level 3 three years after contract award and thereafter	**Software Management Capability:**Evaluation by an independent agency every three years.
SM 2	Work, both automated and manual, is performed according to a predetermined schedule.	**System Management Requirement B:**The contractor shall schedule tasks	**Completeness:** Automated tasks associated with temporal events will be initiated by an automated scheduler. **Completeness:** Manual tasks necessary to achieve NESDIS objectives are planned **Reliability**: 99% of scheduled tasks will execute on time	**Completeness:** NESDIS inspection of scheduler reports **Reliability**: NESDIS inspection of Performance Logs
SM 3	NOAA priorities and processing dependencies influence the level of effort	**System Management Requirement C:**The contractor shall prioritize tasks	**Completeness:** All predecessor and successor relationships of system elements are documented	**Quality:** NESDIS inspection of design documents and performance logs

	and sequence of tasks		**Quality (Measurability):** The relative importance of tasks to each other is represented numerically. **Quality:** Necessary predecessor tasks provide input and/or control information to dependent tasks	
SM 4	Contractor staff is assigned to perform tasks	**System Management Requirement D:**The contractor shall allocate resources to perform planned tasks	**Quality : Project Plans** identify separate tasks and their associated schedule, resource, and effort estimate	**Quality:** NESDIS inspection of project plans
SM 5	The state of the system is always known.	**System Management Requirement E:**The contractor shall monitor performance	**Quality:** The contractor is able to report on the status of all scheduled tasks at all times	**Quality:** NESDIS analysis of system performance logs **Quality:** NESDIS analysis of project management status reports
SM 6	The contractor reports on the cost and schedule status of tasks	**System Management Requirement F:**The contractor shall report system performance	**Quality:** The contractor produces reports on the status of all scheduled tasks	**Quality:** NESDIS analysis of system performance logs **Quality:** NESDIS analysis of project management status reports
SM 7	The NDE System can recover from unexpected failures	**System Management Requirement G:**The contractor shall develop and implement automated backup procedures for all NDE data and procedures for each of the 3	**Data Currency:** The NDE system stores all data necessary to commence normal operations of each of the 3 environments using	**Data Currency:** Analysis of System Test logs for recovery and restart scenarios of each of the 3 environments

		environments: Operations, Development, System Test	data that was current at the time a system failure took place **Data Integrity:** Backed-up versions of NDE operational, developmental, and System Test data are identical to versions of the data in use at the time of the backup **Conformance to Standards**: NDE's automated backup of data and procedures conforms to NESDIS standards **User Need:** The priority of system recovery procedures are based on user community (i.e., end users, developers, non-subscribers, etc.) needs as determined by management decision	**Data Integrity:** Analysis of System Test logs of automated data backup of each of the 3 environments **Conformance to Standards:** Comparison of the written descriptions of NDE's automated backup capabilities with NESDIS standards
SM 8	The NDE System can recover from unexpected failures	**System Management Requirement H:**The contractor shall develop and implement procedures to restart each of the 3 NDE environments (Operations, Development, System Test) using backed-up, current data.	**Data Currency:** Each of the restarted NDE systems commence normal operations using data that was current at the time a system failure took place **Reliability:** After restart, automated	**Data Currency:** Analysis of System Test logs for recovery and restart scenarios of each of the 3 environments **Reliability:** Analysis of System Test logs of automated

			procedures in each of the 3 environments perform their functions as they did prior to system failure **Conformance to Standards**: NDE's automated recovery procedures conform to NESDIS standards **User Need:** The priority of system recovery procedures are based on user community (i.e., end users, developers, non-subscribers, etc.) needs as determined by management decision **Recovery Time:** Each of the NDE systems can be restarted to satisfy a Recovery Time Objectives (RTO) tbd by NESDIS Management	recovery of each of the 3 environments **Conformance to Standards:** Comparison of the written descriptions of NDE's automated backup capabilities with NESDIS standards
SM 9	NDE data assets are valid	**System Management Requirement I:**The contractor shall implement secure procedures and technologies to protect the integrity of NDE's data in the event of:~ human errors when data is entered, ~ errors that occur when data is transmitted from one	**Data Integrity:** Conformance to NESDIS, DOC, and other relevant government security standards	**Data Integrity:** Analysis of System Test logs of scenarios that threatened data validity

		computer to another, ~ software bugs or viruses, ~ hardware malfunctions, such as disk crashes, and ~ natural disasters, such as fires and floods		
SM 10	NDE data assets are confidential	**System Management Requirement J:**The contractor shall implement procedures and technologies to ensure that NDE information is accessible only to those authorized to have access	**Confidentiality:** Conformance to NESDIS, DOC, and other relevant government security standards	**Confidentiality:** Analysis of System Test logs of scenarios that threatened NDE confidentiality
SM 11	NDE data assets are available	see System Operations Requirement G & H (above):	Availability: see System Management Requirement H (above)	Availability: see System Operations Requirement G & H (above)
SM 12	The Operational system operates in an Open Mode	**System Operations Requirement A:**The contractor shall develop and implement procedures to make data available to all users in Open Mode.	~ Completeness & Accuracy: In Open mode, all data is available to all customers and developers	~ Completeness & Accuracy: Analysis of System Performance logs
SM 13	The Operational system operates in a Data Denial mode	**System Operations Requirement B:**The contractor shall develop and implement procedures to make data available only to authorized users in Data Denial mode	~ Completeness & Accuracy: In Data Denial mode, data is available only to authorized customers and developers	~ Completeness & Accuracy: Analysis of System Performance logs
SM 14	The Operational system operates in a Data Denial mode	**System Operations Requirement C:**The contractor shall develop and implement procedures to notify all authorized customers when the system is in Data Denial mode	~ Completeness & Accuracy: In Data Denial mode, notifications are sent to authorized customers and developers	~ Completeness & Accuracy: Analysis of System Performance logs
SM 15	The Operational system operates in a	**System Operations Requirement D:**The contractor shall develop and implement procedures	~ Quality: In NPOESS Degraded Operations mode, products are	~ Completeness & Accuracy: : Analysis of communication

	Degraded Operations mode	to consult with the government (e.g., will NCEP models be adversely affected?) in order to determine whether to alter distribution of products when NPOESS is in a Degraded Operations mode.	distributed only if they will have no adverse affect on customer observations	logs between ESPC and NPOESS~ Completeness & Accuracy: : Analysis of System Performance logs
SM 16	The Operational system operates in a Degraded Operations mode	**System Operations Requirement E:**The contractor shall develop and implement procedures to consult with the government and notify affected customers when NPOESS is in a Degraded Operations mode.	~ Completeness: In Open mode, all data is available to all users ~ Quality: In NPOESS Degraded Operations mode, customers are notified of operational impacts of affected products	~ Completeness: Analysis of communication logs between ESPC and NPOESS, System Performance logs, and Trouble Tickets originating from affected customers
SM 17	Operational products are delivered to customers only if they conform to predetermined standards of quality	**System Operations Requirement F:**The contractor shall develop and implement procedures to control operational product quality by identifying deficiencies of ingested data or metadata received from the IDPS	**Quality:** Recognition and reporting of all Quality Flags received from IDPS **Quality:** Detection of xDR and metadata attributes that are below agreed NDE thresholds of acceptability	~ Analysis of Performance Logs~ Analysis of Trouble Tickets of product problems~ Analysis of Service Requests for product quality improvement
SM 18	Operational products are delivered to customers only if they conform to predetermined standards of quality	**System Operations Requirement G:**The contractor shall develop and implement procedures to control operational product quality by supporting any quality control of NDE output (e.g., products or metadata) performed within each of the NDE	**Standards:** Maintenance of information concerning actions to be taken in the event of quality deficiencies **Quality:** Invocation of all previously agreed procedures and	~ Analysis of Performance Logs~ Analysis of Trouble Tickets of product problems~ Analysis of Service Requests for product quality

		product processing applications.	notifications to address the consequences of low quality (containing attributes below agreed NDE thresholds of acceptability) xDRs, NOAA-unique products, NDE tailored products, and metadata.	improvement
SM 19	Customers (including developers) are provided with information about their orders and system conditions of concern to them.	The contractor shall develop and implement procedures to support notification of users	**Customer Satisfaction:** Customers are satisfied with their ability to obtain information about the status of their orders	**Customer Satisfaction:** Analysis of Customer Satisfaction Surveys.
SM 20	NESDIS requests changes to NPOESS products and services through the NPOESS Change Control Board.	The contractor shall develop and implement procedures to submit Service Requests to NPOESS (both the MMC and the IPO CCB), to log and track these Service Requests, and to log and track all NPOESS responses	**Customer Satisfaction:** Customers are satisfied with NDE procedures to request product changes	**Customer Satisfaction:** Analysis of Service Requests, tracking logs, and Customer Satisfaction Surveys.
SM 21	All correspondence regarding the ESPC is kept	The contractor shall develop and implement procedures to log and track all correspondence	**Completeness:** All electronic and written correspondence is retained and accessible for inspection.	**Completeness: I**nspection of correspondence by date, author, and subject
SM 22	Requests for changes are	The contractor shall develop and implement	**Customer Satisfaction:**	**Customer Satisfaction:**

	saved	procedures to log and track Requests for NDE Service, including product enhancement requests, and NDE responses	Customers are satisfied with NDE procedures to request product changes	Analysis of Service Requests and Customer Satisfaction Surveys.
SM 23	Information about system performance will be kept	The contractor shall develop and implement procedures to log performance data	**Completeness:** Statistics of execution performance (time, volume, number of invocations, etc.) are logged and maintained for analysis (see Software Engineering Design Requirement D)	~ Analysis of System Performance Logs and Reports
SM 24	System performance reports are produced	The contractor shall develop and implement scheduled and on-demand procedures to report performance data	**Completeness:** Reports of system performance (time, volume, number of invocations, etc.) are generated on demand and according to a schedule	~ Analysis of System Performance Logs and Reports

Table 5. NDE Infrastructure Outcomes Matrix

	Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring Method**
NOTE:"Component" refers to hardware, equipment, and licensed software products (i.e., Operating Systems, DBMS, middleware, COTS or GOTS products, CASE tools, etc.) and is used by NDE as a general term in discussions of infrastructure. "Element" refers to NOAA-developed system capabilities (e.g., the source code for algorithms, programs, utilities, control tables, called procedures, etc.) and is used by NDE as a general term in discussions of archiving and configuration management.				
I 1	Establish an infrastructure for **System Testing** that is	Implement key components of the **NDE System Test** capability to process and distribute data	**~ Throughput:** For NPP alone, 4TB/day**~ Quality:** System	**~ Quality:** Analysis of System Performance

	consistent with Software Engineering Requirement C	and products from NPP according to a schedule consistent with Table 2: Timetable of NDE Infrastructure Tasks~ Acquire or lease all System Test infrastructure elements required: hardware, COTS software, telecommunications, middleware, etc.~ Install and integrate all primary System Test infrastructure components ~ Operate and administer the System Test infrastructure~ Execute all necessary upgrades to System Test infrastructure components in accordance with vendor changes and NESDIS standards ~ Manage multiple versions of source code and other reusable objects	elements placed in the operational environment perform without degrading the performance of other operational elements.~ **Quality:** 95% of system elements placed in the operational environment perform for three cycles (i.e., orbital, daily, weekly, etc.) without failing or causing other system elements to fail or perform less effectively~ **Efficiency a:** System Test Environment to be administered and operated by a permanent team of no more than five IT professionals in such a way that all elements submitted to them for testing and review can be evaluated for operational fitness in less than five working days after submission by developers. **~Efficiency b:** System elements and components that are placed in the operational environment can be	logs~ **Efficiency:** Analysis of System Test activity reports~ **Business Continuity:** Analysis of System Performance logs~ **Scalability:** Analysis of upgrade activity logs

			executed immediately without failing or causing other system elements to fail or perform less effectively .~ **Business Continuity:** In the event of an emergency failure of the operational environment, the System Test Environment will be able to deliver products to the operational community within the same throughput and latency parameters as the operational system. (See Performance Standards for Operations above)~ **Scalability:** Additional capacity (throughput, latency, performance)	
I 2	Establish a scalable infrastructure for **operational product generation and distribution**, beginning with NPP, that is consistent with Software	Implement the **NDE Operational capability** according to a schedule consistent with Table 2: Timetable of NDE Infrastructure Tasks:~ Acquire or lease all operational infrastructure elements required: hardware, COTS software, telecommunications, middleware, etc.~ Install and integrate all the	~ **Throughput:** For NPP alone, 4TB/day For NPP and NPOESS C1, 8 TB/day For NPOESS C1 and C2, 8 TB/day For NPOESS C1, C2, and C3, 12 TB/day~ **Latency:** products available to customers less than 5 minutes after	**Throughput, Latency:**~ Analysis of System Test Logs generated no later than October 1 2008 (or 18 months prior to NPOESS C1 launch if launch date slips).~ After NPP LEOP, NOAA

	Engineering Design Requirement A, in order to provide telecommunications, data management, storage, and processing capabilities to support the NPP satellite mission.	necessary operational infrastructure components~ Operate and administer the operational infrastructure~ Execute all necessary upgrades to infrastructure components in accordance with vendor changes and NESDIS standards	final receipt of all necessary data elements (standard to be applied for 98% of all products) ~ **Scalability:** Additional capacity (throughput, latency, performance) can be created without redesign of the operational infrastructure **~Interoperability:** Able to receive data from IDPS in real time **~Interoperability**: Able to send/receive messages to/from the NPOESS Mission Management Center (MMC) in real-time. **~Interoperability:** Able to deliver (push) products to customer systems in the event that customers choose this method of delivery	inspection of Product Generation Control Logs **Scalability: ~Interoperability:** Analysis of System Performance Logs
I 3	Establish an infrastructure for use by developers of NDE data processing capabilities and by developers of	Implement key components of the **NDE Development capability** according to a schedule consistent with Table 2: Timetable of NDE Infrastructure Tasks~ Acquire or lease all developmental	**~Interoperability:** Ability to send/receive data and messages with the NPOESS ground system, particularly the IDPS, is demonstrated by	**~ Efficiency:** Biannual Evaluation of Developer Satisfaction Surveys and monthly analysis of Trouble Tickets and

	science algorithms (e.g., **development environment)** that is consistent with Software Engineering Requirement B	infrastructure elements required: hardware, COTS software, telecommunications, middleware, etc.~ Install and integrate primary development infrastructure components ~ Operate and administer the developmental infrastructure~ Execute all necessary upgrades to development infrastructure components in accordance with vendor changes and NESDIS standards ~ Manage multiple versions of source code and other reusable objects	December 2006~ **Efficiency:** Developers believe that the environment supports them without interfering with their creativity or productivity~ **Capacity:** Algorithms and system utilities can be tested using high volumes (tbd) of stored historical, experimental, and test data~ **Reliability:** Historical datasets are stored and administered in order to guarantee their integrity and currency ~ **Reusability**: Developers install system elements (i.e., data, procedures, objects) into their programs that have been extracted from controlled "libraries" to create functionality ~ **Reusability:** Developers perform tests using previously developed elements (test scripts, test data, test scenarios, etc.) ~ **Scalability:** Additional capacity (throughput,	Service Requests received from developers. ~**Capacity:** Tests using historical data execute in no more than 50% of the clock time of an equivalent product generation execution in the operational environment ~**Reusability:** Design Inspections, Code Inspections

			latency, performance) can be created without redesign of the Development infrastructure	

Table 6. NDE Data Retention & Archive Outcomes Matrix

	Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring Method**
NOTE: Unless specifically named as applicable to one or two environments (Operations, Development, or System Test) all Data Retention & Archive requirements are applicable to each of the 3 environments described in Software Engineering Design Requirements A, B, and C. NOTE: "Element" refers to NOAA-developed system capabilities (e.g., the source code for algorithms, programs, utilities, control tables, called procedures, utilities, etc.) and is used by NDE as a general term in discussions of archiving and configuration management. "Component" refers to hardware, equipment, and licensed software products (i.e., Operating Systems, DBMS, middleware, COTS or GOTS products, CASE tools, etc.) and is used by NDE as a general term when referring to the infrastructure.				
DA 1	Data Retention: Recently generated products are available for additional processing	The contractor shall develop and implement procedures to retain NOAA-unique Products for 72 hours	~ **Quality** - Minimal (tbd) retrievals from CLASS of NOAA-unique products that are less than 72 hours old	
DA 2	Data assets will be managed at the system level in all three environments	The contractor shall provide resources and implement procedures to add, update, and delete shared data resources in a controlled manner according to agreed user (either developer, tester, or customer) needs in each of the three environments.	**Data Integrity:** Data resources (including test, historical, and experimental data and metadata) are maintained with a minimum of duplication. **Data Integrity:** Data resources (including test, historical, and	**Data Integrity:** Analysis of performance logs of system utilities routinely performed to detect duplication and eliminate wasted data storage space

			experimental data and metadata) are deleted after a reasonable (tbd) interval of disuse	
DA 3	Data Retention: Users, both customers and developers, can obtain the same operational product more than once within 72 hours.	The contractor shall develop and implement procedures to manage and retain data if requested by a user	~ **Completeness, Latency** - All requested products are retained for up to 72 hours	Analysis of Service Requests for product retention
DA 4	Archive: All system elements necessary for NDE operational product generation are archived.	The contractor shall develop and implement procedures to deliver to NOAA's Long Term Archive (CLASS) all data and system elements required by NDE for processing tailored products or NOAA-unique products. These include, minimally: o Metadatao Ancillary data o Processes used to create products, including system configurations, software processes, and necessary parameterso TBD intermediate products per process	~ **Completeness** - Evidence of receipt by CLASS	~ Inspection of CLASS receipts
DA 5	Archive: All system elements necessary for NDE product generation in the development environment	The contractor shall develop and implement procedures to store and manage all data and system elements required by NDE developers for testing. These include, minimally: o Metadatao Ancillary data o Processes	~ **Completeness** - Evidence of receipt by CLASS	~ Inspection of CLASS receipts

	are archived.	used to create products, including system configurations, software processes, and necessary parameterso TBD intermediate products per process		
DA 6	Archive: All operational NOAA-unique products are archived.	The contractor shall develop and implement procedures to deliver all NOAA-unique products generated by the NDE system NOAA's Long Term Archive (CLASS)	**~ Completeness** - Evidence of receipt, by CLASS, of all NOAA-unique products generated by the NDE system	~ Inspection of CLASS receipts
DA 7	Archive: A catalog of NDE's archived material is available	The contractor shall develop and implement procedures to provide catalog information for archived data	**Completeness, Accuracy** -The contractor shall provide catalog information for archived data	~ Ability to retrieve any cataloged item from CLASS~ Inspection of catalog
DA 8	Archive: Archived data is used by NDE product processing	The contractor shall develop and implement procedures to retrieve archived data	**Reliability**- The contractor retrieves archived data **Timeliness -** The contractor retrieves archived data as quickly as allowed by CLASS performance capabilities	~ Observation
DA 9	Archive: Archived data is used by NDE product processing	The contractor shall develop and implement procedures to process archived data	**Timeliness, Quality** - The contractor shall process archived data	~ Demonstration
DA 10	Information about NDE's products and NPOESS observations shall be retained for future use.	The Contractor shall develop and implement procedures to conform to metadata standards	Completeness, Accuracy - The Contractor reports on violations of metadata standards (e.g., FGDC Content Standard for Digital Geospatial	Inspection of metadata reports

			Metadata) .	
DA 11	Users of archived NDE products will be provided with information about whether the data values are outside of agreed, standard ranges.	The Contractor shall develop and implement procedures to provide notification of data anomalies of archive data to customers	~ Accuracy - The Contractor identifies all instances of anomalous data values~ Timeliness, Customer Service - Prior to archiving, the Contractor links a notification of anomalous data values to all instances of any product containing the detected anomaly	~ Inspection of data quality logs~ Inspection of user notifications
DA 12	NDE can replace products that it has previously archived with instances of the products in which anomalies have been repaired.	The Contractor shall develop and implement procedures to change archived products through version control	~ Conformance to Standards - The Contractor shall be knowledgeable of archiving standards~ Completeness - The Contractor shall report all instances of archived product replacements to management	Inspection of reports detailing changes to archived data.

Table 7. NDE Interface Outcomes Matrix

XF 1	Receipt of data and products from NPOESS Interface Data Processing Segment (IDPS)**(Note:** "Data and products" refers to, at a	~ The contractor shall provide a capability for receiving data and products from IDPS.~ The contractor shall provide a capability for determining whether the data and products ingested by NDE from IDPS are the same as the data and products that	**Completeness, Reliability, Timeliness:** 100% of the data sent by the IDPS is received in real time	NESDIS inpection of Performance logs

	minimum, products [including SARSAT & A-DCS], ancillary data, auxiliary data, and metadata,**)**	were sent.		
XF 2	Data is made available to customers and developers**(NOTE:** "Customers" are defined in Section 2 of the NDE Project Plan.)	The contractor shall provide a capability for ensuring that NDE's tailored products and NOAA-unique products are made available to authorized customers and developers	**Completeness, Reliability, Timeliness:** 100% of the products sent are received in real time	NESDIS inpection of Performance logs
XF 3	Products are made available for customer retrieval	The contractor shall provide a capability for ensuring that NDE's tailored products and NOAA-unique products are placed in locations from which they can be retrieved by customers in real time	**Reliability:** 100% of the products placed for retrieval can be extracted	NESDIS inpection of Performance logs
XF 4	Products are made available for retrieval by developers in NOAA and Cooperative Institutes	The contractor shall provide a capability for ensuring that NDE's tailored products and NOAA-unique products are placed in locations from which they can be retrieved by developers	**Reliability:** 100% of the products placed for retrieval can be extracted	NESDIS inpection of Performance logs
XF 5	Transmission of product to Comprehensive Large Array-data Stewardship System (CLASS)	The contractor shall send NDE's NOAA-unique products to CLASS.	**Completeness, Reliability, Timeliness:** 100% of the data sent to CLASS is received in real time	NESDIS inpection of Performance logs
XF 6	Transmission	The contractor shall send	**Completeness,**	NESDIS

	of system components to Comprehensive Large Array-data Stewardship System (CLASS)(NOTE: "System elements" is inclusive of all system objects invoked to create or tailor a product, including, but not limited to, time-stamped source code, time-stamped control tables such as those containing the actual correlation coefficients used for processing, and any associated time-stamped documentation.)	NDE elements (Source Code, Utilities, Algorithms, Control Tables, etc.) to CLASS.	**Reliability, Timeliness:** 100% of the system elements sent to CLASS are received in real time	inpection of Performance logs
XF 7	Receipt of products from Comprehensive Large Array-data Stewardship System (CLASS)	The contractor shall receive xDRs and NOAA-unique products from CLASS.	**Completeness, Reliability, Timeliness:** 100% of the data sent by CLASS is received in real time	NESDIS inpection of Performance logs
XF 8	Receipt of system elements from Comprehensive	The contractor shall receive NDE elements from CLASS	**Completeness, Reliability, Timeliness:** 100% of the system	NESDIS inpection of Performance logs

	Large Array-data Stewardship System (CLASS)		elements sent by CLASS are received in real time	
XF 9	Interface to the NPOESS Mission Management Center (MMC)	The contractor shall provide an interface for NDE to the MMC	**Completeness, Reliability, Timeliness:** ~100% of the inquiries to the MMC and replies to MMC requests are received by the MMC in real time~100% of the notifications and inquiries from the MMC are received by the MMC in real time	NESDIS inpection of Performance logs
XF 10	Interface with the IPO's Service Request System	The contractor shall provide an interface for NDE Service Requests to the IPO	**Completeness, Reliability, Timeliness:** ~ 100% of the NDE Service Requests intended for the IPO's attention are delivered to the IPO~ 100% of the IPO's responses to the NDE Service Requests intended for the IPO's attention are received by the contractor	NESDIS evaluation of regular status reports
XF 11	Interface with NPOESS' IDPS operations	The contractor shall provide an interface for ESPC's operations to communicate with the IDPS operations	**Completeness, Reliability, Timeliness:** ~ 100% of the NDE communications intended for the IDPS operator's attention are delivered to IDPS	NESDIS evaluation of regular status reports

			operations~ 100% of the IDPS operator's responses to the NDE communications are received by the contractor	
XF 12	Customers and developers receive products in a desired format.	The contractor shall provide a capability for receiving NDE *Service Requests* (SRs) from customers.	~ Availabity 24 X 7~ Ease of Customer Use TBD~ Ease of Operator Use TBD	NOAA inspection
XF 13	Customers and developers obtain tools to reformat products on their systems.	The contractor shall provide a capability to respond to NDE service requests with *Service Responses*.	~ Ease of Customer Use TBD~ Ease of Operator Use TBD	Analysis of automated Help System Reports

Table 8. NDE Product Generation Outcomes Matrix

	Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring Method**
PG 1	The customer receives products in a desired format.	**Product Format Requirement:**The contractor shall provide and implement software to reformat the HDF5 data records received from the Interface data Processing Segment (IDPS) into customer-specified formats. The requirement applies to both tailored and NOAA-unique NDE environmental satellite data products. Anticipated formats include, but are not limited to, the	**Accuracy & Completeness -** Reformated Products must have identical content to the HDF5 versions received from the IDPS	~ NESDIS Inspection of Products~ Customer Satisfaction Surveys

		following: BUFR, GRIB, FF, GIF, GeoTIF, McIDAS, HDF, SARAD, SATEM, NetCDF.		
PG 2	The customer obtains tools to reformat products on his system.	**HDF5 Data Conversion Tools Requirement:**The contractor shall make available, for use at customer sites, software that will convert the HDF5-format NPOESS xDRs into one of several, specified (tbd) formats.	**System Compatability -** Data Conversion tools must be capable of execution by customers using "standard" operating systems (e.g., LINUX, AIX,) and telecommunications (e.g., FTP, Internet, API). **Accuracy & Completeness -** The products reformatted with the NOAA-supplied data conversion tools must have identical content to the HDF5 versions received from the IDPS	~ NESDIS Inspection of Products~ Customer Satisfaction Surveys
PG 3	Product Tailoring Requirement A: The products are received by customers in a compressed state.	**Lossless Product Compression Requirement:**The contractor shall provide and implement software to compress both tailored and NOAA-unique NDE environmental satellite data products, using customer specified compression formats. Anticipated compression formats include, but are not limited to, the following: GZIP, ZIP.	**Accuracy & Completeness -** De-compressed product must have identical content to the pre-compressed versions.	~ NESDIS Inspection of Products~ Customer Satisfaction Surveys

PG 4	Product Tailoring Requirement B: The products are received by customers in a compressed state.	**Lossy Product Compression Requirement:** The contractor shall provide and implement software to compress both tailored and NOAA-unique NDE environmental satellite data products, using customer specified, lossy compression formats. Anticipated compression formats include, but are not limited to, the following: RICE, JPEG.	**Accuracy & Completeness -** De-compressed product must have acceptably similar content (tbd) to the pre-compressed versions.	~ NESDIS Inspection of Products~ Customer Satisfaction Surveys
PG 5	Product Tailoring Requirement C: The customer obtains different projection views of the same product.	**Product Projection Requirement:** The contractor shall provide and implement software to allow customers to choose specified (tbd), alternative projection views (i.e., platecarre, Mercator, polar stereographic) of both tailored and NOAA-unique NDE environmental satellite data products	**Accuracy & Completeness -** Products that have been repackaged using projection views (i.e., mercator, polar projection, etc.) other than those of the original product received from the IDPS must contain the same information as the original, IDPS versions of the products. Quality: Projection views provided must conform to standard projection specifications	~ NESDIS Inspection of Products~ Customer Satisfaction Surveys
PG 6	Product Tailoring Requirement D: The customer receives aggregated products in different	**Product Frequency Requirement:** The contractor shall provide and implement software to deliver both tailored and NOAA-unique NDE environmental satellite data products at the	**Accuracy & Completeness -** Aggregated products must accurately represent the separate elements from which the	~ NESDIS Inspection of Products (Comparison of the separate components with the aggregated product) ~

	frequency ranges.	frequency specified by customers. Anticipated frequencies include, but are not limited to, the following: Daily, weekly, orbital, etc.(tbd).	product was assembled.	Customer Satisfaction Surveys
PG 7	Product Tailoring Requirement E: The customer has a choice of the grid spacing of product	**Product Grid Spacing Requirement:** The contractor shall provide and implement software to deliver both tailored and NOAA-unique NDE environmental satellite data products with specified (tbd) grid spacing .	**Accuracy & Completeness -** Re-gridded products must contain no less data than the IDPS-supplied products from which they were derived unless the end-user formally agrees to lower resolution	~ NESDIS Inspection of Products~ Customer Satisfaction Surveys
PG 8	The customer receives NOAA-unique products.	**NOAA-unique Product Generation Requirement:**The contractor shall provide and implement software to augment the data records received from the Interface Data Processing Segment (IDPS) to generate NOAA-unique environmental satellite data products through application of NOAA-supplied algorithms and utilization of NOAA-supplied data.	**Accuracy & Completeness -** Each NOAA-unique product will be described in terms of explicit, expected test results prior to the installation of the NOAA-supplied algorithm on the product generation system. The NOAA-unique products must satisfy these test requirements.	~ NESDIS Inspection of Products~ Customer Satisfaction Surveys
PG 9	NDE acquires ancillary data from external sources	**Ancillary Acquisition Requirement:**The contractor shall retrieve control information necessary for product generation from sources such as NCEP, NAVOCEANO, METOPS, and other external systems.	**~ Completeness:** 100% of the ancillary data required for product generation will be acquired**~ Reliability**: The ancillary data products obtained can be effectively	**~Completeness:** ~NESDIS inspection of Production logs **~ Quality**: NESDIS analysis of product accuracy

			applied in product generation algorithms	
PG 10	The ancillary data delivered to NPOESS is the same as the ancillary data used by NESDIS	**Ancillary Data Quality Requirement:**The contractor shall review and certify Ancillary Data	**~ Completeness:** 100% of the ancillary data requested by NPOESS will be distributed to NPOESS**~ Reliability**: The ancillary data products provided can be effectively applied in product generation algorithms	**~Completeness:** ~NESDIS inspection of Production logs**~ Reliability**: NESDIS comparison of IDPS products and algorithms with NPOESS prodiucts and algorithms
PG 12	Customers will request product enhancements	**Product Enhancement Requirement:** The contractor shall provide procedures for capturing the requirements for product enhancement requests	**Customer Satisfaction:** 90% of customers surveyed report that they were pleased with the procedures for defining their product enhancement requirements	Customer Satisfaction Surveys

Table 9. NDE Communications & Distribution Outcomes Matrix

	Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring Method**
CD 1	Customers (e.g., NOAA operational users) obtain NPOESS-based products	**Product Delivery Timeliness Requirement:**The contractor shall develop and implement procedures to make products available to customers.	~ **Availability:** Products will be made available to customers within one minute of their receipt from the NESDIS product processing system	~ NOAA Inspection of Daily, Weekly, and Monthly Product Distribution Logs
CD 2	External development organizations exchange very large (TBD), experimental datatsets with NOAA.	The contractor shall provide communication pathways with sufficient bandwidth to allow the exchange of large (TBD), experimental datasets and products between the ESPC and external NOAA development partners such as the Cooperative Institutes.	~ **Throughput:** >*4* (tbc) GB/s	~ Demonstration~ Analysis of System test logs recording the results of scenarios designed to determine maximum throughput between ESPC and non-NOAA development partners~ Analysis of Performance Logs
CD 3	Customers obtain NPOESS-based products	**Product Delivery Cost Requirement:**The contractor shall develop and implement procedures to distribute products to customers at the optimal cost for performance desired.	~ **Cost**	~ NOAA will monitor/review contract cost as described in the required trade study every three years
CD 4	The NDE network can be accessed only	**Product Delivery Security Requirement:**The	~ **Security:** The Contractor shall provide to NESDIS	~ NOAA's inspection of security standards

	with the authorization of ESPC	contractor shall develop and implement procedures to distribute products to customers ensuring compliance to DOC/NOAA security and data integrity policies.	a trade study for the choice of the proposed technology.	imposed by the contractor.
CD 5	NDE adopts an architecture that addresses NPOESS-based product distribution to customers.	**Product Delivery Design Requirement:**The contractor shall undertake a trade study and report on the costs and benefits of implementing feasible product communication schemes and communication infrastructure alternatives. Among other ideas, the study must encompass providing Points of Presence (POPs) at each of the following customer sites to receive products transmitted from the NOAA Central at the NSOF: \ NESDIS, to Suitland's NSOF \ SARSAT, to Suitland's NSOF \ NWS to a customer-designated POP \ OAR to a customer-designated POP \ NMAO to a customer-designated POP \ NOS to a customer-designated POP \ NMFS to a customer-designated POP \ NOAR to a customer-designated POP \ Academic/Universities Suitand to customer-designated POP(s) \ International/EUMETSAT to a customer-designated POP	~ **Availability:** Over the course of each calendar year, the NPOESS-derived product distribution capability at NSOF will be operational more than 99% (tbc) of the time each month.	~ Prior to selection, the contractor shall propose a networking infrastructure study plan to meet requirements.
CD 6	Customers	**Product Delivery**	~ **Availability:**	~ NOAA

	obtain NPOESS-based products	**Performance Requirement:**The contractor shall develop and implement procedures to make NPOESS-based products available to customers.	Over the course of each calendar year, the NPOESS-derived product distribution capability at NSOF will be operational more than 99% (tbc) of the time each month.	Inspection of Daily, Weekly, and Monthly Product Distribution Logs
CD 7	USMCC receives SARSAT telemetry captured by NPOESS satellites	**SARSAT Requirement:**The contractor shall distribute SARSAT telemetry from IDPS to USMCC.	~ **Timeliness:** SARSAT Telemetry captured by NPOESS satellites will be distributed to USMCC within thirty seconds of their receipt by NESDIS.	~Prior to selection, the contractor shall propose a networking infrastructure plan to meet requirements. ~NOAA Inspection of Daily, Weekly, and Monthly SARSAT Product Distribution Logs
CD 8	The US Global Positioning Center receives ADCS data and telemetry captured by NPOESS satellites.	**ADCS Requirement:**The contractor shall route ADCS Data from IDPS to the US Global Processing Center.	~ **Timeliness:** ADCS signals captured by NPOESS satellites will be distributed to the US Global Processing Center within thirty seconds of their receipt by NESDIS	~Prior to selection, the contractor shall propose a networking infrastructure plan to meet requirements. ~NOAA Inspection of Daily, Weekly, and Monthly ADCS Product Distribution Logs
CD 9	The customer receives products in a timely manner	**Product Processing Timeliness Requirement:**The contractor shall deliver NPOESS-derived products to customers as quickly as possible.	**Timeliness:**No more than five minutes will elapse from the point-in-time when all of the required xDRs needed to create or	~ NESDIS Inspection of Production Logs~ Customer Satisfaction Surveys

			to tailor a product are received from the IDPS and the point-in-time when the tailored or NOAA-unique product is made available for distribution to customers	

Table 10. NDE Inherited from ESPC Outcomes Matrices

_Desired Outcomes	Required Service	Performance Standard	Monitoring Method
Recommended CM Plan	Contractor shall evaluate current process and generate a recommend plan, utilizing Software Engineering Institute's (SEI) Capability Maturity Model (CMM)	Recommended plan generated 4 months after Task Order award	Weekly and monthly status reports
Level 2 CMM for developmental systems	Implement CMM processes based on Government approved plan	Implementation according to Government approved schedule, nominally 12-16 months	Weekly and monthly status reports

(ESPC Technical Documentation Outcomes Matrix)

Desired Outcomes	Required Service	Performance Standard	Monitoring Method
Complete documentation library for all IPD documents	The Contractor shall provide support for the identification, development, status tracking, and delivery of all IPD documentation. Coordinate all additions, modifications, and deletions of IPD documents with the NSOF Library Management System as identified in the CITS Concept of Operations document. Manage and keep up to date the master list of IPD documents.	99% of the time the Contractor shall complete the assigned tasks on or before mutually (GTM and Contractor) agreed upon milestones/due dates.	Monthly and quarterly review with Contractor.
Generation of new documents.	The Contractor shall create any new documents required in IPD to support	All documentation shall be complete and meet specified NOAA	Monthly and quarterly review with Contractor.

	facilities, infrastructure, communications, all computer systems, system and application software documents	standards. 99% of the time the Contractor shall complete the assigned tasks on or before mutually (GTM and Contractor) agreed upon milestones/due dates.	
Maintain multiple formats of IPD documentation.	The Contractor shall maintain IPD documents in various standard electronic formats which could fall into either editable, fixed, or both. Documents in production will be maintained in an editable/transferable format. An editable / transferable format ensures that IPD has the ability to revise and update documents as necessary. The Contractor shall work with several file formats including, but not limited to, WordPerfect Office, Microsoft Office, PDF, VISIO, and XML.	Documentation shall be complete and meet specified NOAA standards.	Monthly and quarterly review with Contractor.
Support for the IPD documents provided on the web server.	The Contractor shall publish and manage all the documents that are made available on the IPD document web server	Publications and documents shall meet specified NOAA standards. 99% of the time the Contractor shall complete the assigned tasks on or before mutually (GTM and Contractor) agreed upon milestones/due dates.	Weekly and/or monthly status reports or briefings.
Configuration management of all IPD documentation.	The Contractor shall manage and support the configuration management of all IPD documentation using the IPD CM tool specified by IPD management.	All IPD documentation shall be included in the configuration management process and shall meet all NOAA specified standards.	Monthly and quarterly status report and monthly briefing.

Management of the various physical libraries in NSOF in support of the Information Processing Division.	The Contractor shall manage the physical IPD library within the ESPC Data Processing Center, the Information Processing Division located on the first floor, and coordinate compliance with the NSOF Library Management System (LMS) where hardcopy documents are stored as well as original copies of software. Maintain an up to date listing of all items stored in the various libraries. Conduct yearly updates of all required IPD documents.	All libraries will be maintained to be in compliance with NOAA as well as NSOF LMS standards.	Monthly review and quarterly report.
Documentation support for briefings and presentations.	The Contractor shall provide generate, modify, and publish required briefing packages.	All briefings, presentations, and publications shall be in compliance with NOAA and NESDIS standards. 99% of the time the Contractor shall complete the assigned tasks on or before mutually (GTM and Contractor) agreed upon milestones/due dates.	GMT review during inception, development, and through final delivery.

(ESPC ADP Security Outcomes Matrix)

Desired Outcomes	Required Service	Performance Standard	Monitoring Method
Ensure ADP Security Plans are kept up to date.	The Contractor shall update the ADP Security Plans with assistance of the Government no more frequently than semi-annually.	This draft plan shall be completed within (30) calendar days of notification. It shall be reviewed by the Government within fifteen (15) days, and the Contractor shall finalize the move plan within fifteen (15) calendar days of final government review.	The Contractor shall provide a weekly status report (oral and/or e-mail) and conduct a monthly Contractor status review.
Ensure responses to data calls from higher echelons prepared on an as needed basis.	The Contractor shall respond to data calls from higher echelons on an as needed basis.	The responses shall be completed in a stipulated time frames in order to give the Government time to review them prior replying to the higher echelon.	The Contractor shall provide a weekly status report (oral and/or e-mail) and conduct a monthly status review.
Ensure all security regulations and policies are complied with.	The Contractor shall make sure all ADP Security regulations and policies included in the above-mentioned documents are adhered to.	Familiarize all employees with above-mentioned regulations.	The Contractor shall provide a weekly status report (oral and/or e-mail) and conduct a monthly Contractor status review.
ESPC development, test, and operational systems will be secure	The Contractor shall follow (DOC/NOAA/NESDIS) procedures and policies for securing systems	An ESPC system, or ESPC data, will never be compromised and the systems will be available	Annual self-assessment of ESPC systems.
ESPC systems will be able to be certified and accredited	The Contractor shall develop and deliver (DOC/NOAA/NESDIS) security documentation (to include the System Security Plan (SSP), Self Assessment, COOP, Requirement Traceability Matrix, and Test Plans	Completeness: All security documentation has been completed. Quality (Measurability): The information in the documentation accurately reflects the conditions on the system.	Review of the ESPC systems SSP, Self Assessment, COOP, Requirement Traceability Matrix, and Test Plans and Procedures

	and Procedures) to support certification and accreditation See Figure 6		

Data Requirement List
The below table identifies the documentation to be delivered in support of IT Security requirements.

Deliverable	NIST ID	Title of Guideline	Delivery Draft	Delivery Final
System Security Plan	**SP 800-18**	Guide for Developing Security Plans for Information Technology Systems, **December 1998**	**Proposal**	**120 Days prior to IOC**
Self Assessment	**SP 800-26**	Security Self-Assessment Guide for Information Technology Systems, **November 2001**	**30 Days after CDR**	**120 Days prior to IOC**
Risk Assessment	**SP 800-30**	Risk Management Guide for Information Technology Systems, **July 2002**	**SRR, PDR**	**CDR**
COOP	**SP 800-34**	Contingency Planning Guide for Information Technology Systems, **June 2002**	**30 DAC**	**90 Days After draft comments provided by the government**
Requirement Traceability Matrix, Test Plans and procedures, Test report, POA&M	**SP 800-37**	Guide for the Security Certification and Accreditation of Federal Information Systems, **May 2004**	**As Specified in SOW**	
Technical Control Checklist	**SP 800-53**	Recommended Security Controls for Federal Information Systems,	**CDR**	**Earliest of 60 days after CDR or 120 days prior to IOC**

		February 2005		
Incident Response	**SP 800-6**	Computer Security Incident Handling Guide, **January 2004**	**PDR**	**CDR**

	Desired Outcomes	Required Service	Performance Standard	Monitoring Method
(ESPC Computer Operations Outcomes Matrix)				
CO1	All ingesting, receiving, processing and distribution of data will be done in a timely manner.	The operators shall check schedules and wall clock for data latency and interface with the appropriate center	All systems shall not be interrupted for more than 2 hours per occurrence.	Ingesting, receiving, processing and distribution logs
CO2	Problems on all ingesting, receiving, processing and distribution systems will be resolved as soon as possible.	The operators shall diagnose and resolve problems with the aid of programmers or systems personnel.	All systems shall not be interrupted for more than 2 hours per occurrence.	Ingesting, receiving, processing and distribution logs.
CO3	Administrative tasks that are specific to operations are performed. Operations staff shall load paper, perform light maintenance and distribute printouts from network printers located in Mission Control.	The operators shall understand the tasks that are specific to the crew leader, and perform those tasks. The operators shall respond to all requests for printouts. All requests shall be responded to correctly and completely.	All tasks are completed on time, and changes work as expected. 100% of all requests for assistance shall be completed	Morning reports. Reports generated from User Request Tracking Tool will be presented to the government monthly.
CO4	Operations staff shall respond in a timely manner for requests for information on ESPC products and services.	The operators shall respond to all requests for information within 2 hours of receiving request. All requests shall be responded to correctly and completely.	100% of all requests for information shall be completed or reassigned to subject experts. 90% of user satisfaction feedback entries shall be at the “satisfactory” or higher level.	Reports generated from User Request Tracking Tool will be presented to the government monthly.

(ESPC User Services/Help Desk Outcomes Matrix)

Desired Outcomes	Required Service	Performance Standard	Monitoring Method
One-stop user services/helpdesk suite of tools.	The Contractor shall develop the suite of tools.	99% of the time the Contractor shall complete the assigned tasks on or before mutually (GTM and Contractor) agreed upon milestones/due dates.	Established milestones/due dates status reports.
All ingesting, receiving, processing and distribution of data will be done in a timely manner.	The operators shall check schedules and wall clock for data latency and interface with the appropriate center	All systems shall not be interrupted for more than 2 hours per occurrence.	Ingesting, receiving, processing and distribution logs
Problems on all ingesting, receiving, processing and distribution systems will be resolved as soon as possible.	The operators shall diagnose and resolve problems with the aid of programmers or systems personnel.	All systems shall not be interrupted for more than 2 hours per occurrence.	Ingesting, receiving, processing and distribution logs.
Administrative tasks that are specific to operations are performed.	The operators shall understand the tasks that are specific to the crew leader, and perform those tasks.	All tasks are completed on time, and changes work as expected.	Morning reports.
Operations staff shall respond in a timely manner for requests for information on ESPC products and services.	The operators shall respond to all requests for information within 2 hours of receiving request. All requests shall be responded to correctly and completely.	100% of all requests for information shall be completed or reassigned to subject experts. 90% of user satisfaction feedback entries shall be at the "satisfactory" or higher level.	Reports generated from User Request Tracking Tool will be presented to the government monthly.
Operations staff shall load paper, perform light maintenance and distribute printouts from network printers	The operators shall respond to all requests for printouts. All requests shall be	100% of all requests for assistance shall be completed	Reports generated from User Request Tracking Tool will be presented to the government monthly.

located in Mission Control.	responded to correctly and completely.		
All hardware equipment in equipment list shall be maintained to provide 24x7 support of ESPC	The Contractor shall provide first echelon maintenance support of equipment, and facilitate through other vendors repair of all equipment.	All critical systems equipment shall not be interrupted for more than 2 hours per occurrence. Backup hardware shall be available.	Morning reports and production logs.
All user calls for support or inquiry are directed to appropriate personnel for resolution.	The Contractor shall provide help desk user services 24x7 to respond to user calls.	All calls will be routed to appropriate personnel within 5 minutes.	Customer surveys and morning reports.
Uses are notified on anomalies, extended outages, or significant changes to data, products or services.	The Contractor shall notify, through established email list, users of significant changes to production, which have impact to users.	Dissemination of appropriate information will occur within 10 minutes of identification of required notification.	Morning reports, logs, and email receipt
Government management is kept informed of critical outages and interruptions to service.	The Contractor shall notify appropriate predefined government contacts with defined time limit for service interruptions.	Telephone notification shall occur within defined standards - some within 30 minutes some within 2 hours - depending on product and outage.	Morning reports and meetings.
Electronic logs available for government review.	The Contractor shall record all actions, phone calls, email contacts in daily logs to be disseminated to defined list of government and contractor personnel.	Logs shall be disseminated by 7am local time and posted to secure web site.	Log review
Establishment, maintenance, and updating of help trouble tickets.	The Contractor shall maintain a searchable help ticket database for use in tracking problems and	Database shall be updated as conditions warrant, access (read only) shall be granted to government	Daily reviews of open help tickets by government.

	resolutions.	personnel.	
Creation of daily, weekly, monthly, and quarterly logs and reports.	The Contractor shall track key critical systems and communication components for up time, and product creation and delivery.	Logs and reports shall be made available with metrics on an on going basis.	Review of logs.
Remote monitoring of networks and computers.	The Contractor shall monitor from one location the activity of networks and computer, including but not limited to: uptime, disk space, CPU usage	All critical components shall be monitored 24x7 for properties, which may attribute to system failure or anomalies.	Reviews of log and return to service time.
Support of key operating systems for operational products and support	The Contractor shall maintain operating systems used in operational production including but not limited to: Linux, AIX, Unix, Solaris, Windows, McIDAS	All critical systems shall not be interrupted for more than 2 hours per occurrence	Review of processing, distribution, and daily logs.
All operational software are to latest standards.	The Contractor shall update baseline software to latest operational versions in support of operational product creations and dissemination.	Baseline software shall be upgraded within 90 days of operational release if no impacts to production.	Review of baseline software database.
Products creation and dissemination are verified.	The Contractor shall monitor creation of products and dissemination of products to ensure product and services are delivered.	Products and services shall not be interrupted for more than 2 hours.	Review of check sheets, logs, and processing and distribution logs.

(ESPC User Services/Help Desk/Customer Service Outcomes Matrix)

	Desired Outcomes	**Required Service**	**Performance**	**Monitoring Method**

			Standard	
US1	Customers shall have one point of entry for requests for OSDPD products and services.	The Contractor shall set up and staff a help desk during normal business hours (8:30 a.m. to 5:30 p.m. Eastern Time.	A draft staffing and operations plan shall be completed within thirty (30) calendar days of contract award. It shall be reviewed by the Government within fifteen (15) calendar days, and the Contractor shall finalize the staffing plan within fifteen (15) calendar days of final government review.	The Contractor shall provide a weekly status report (oral and/or email) and conduct a monthly status review.
US2	Help desk staff shall respond in a timely manner for requests for information on OSDPD products and services. Customer satisfaction shall be maintained at a level of at least 90%.	The Contractor shall respond to all requests for information within 5 days of receiving request. All requests shall be responded to correctly and completely.	100% of all requests for information shall be completed or reassigned to subject experts within 5 days of receipt date. 90% of customer satisfaction feedback entries shall be at the "satisfactory" or higher level.	Reports generated from Customer Request Tracking Tool will be presented to the government monthly. Customer Satisfaction Feedback summaries shall be submitted to the government monthly.
US3	Help desk staff shall route all complicated and specialized requests to product experts to answer.	The Contractor shall develop and maintain a directory of designated experts for each product and service, and shall have the ability to route and track all requests forwarded to these experts through the web based customer service request tracking	The Contractor shall deliver a directory of products, services and associated "experts" to the government for approval within 60 days of contract award. The Government will approve or will identify substitutions within 30 days of receipt. The Contractor shall	Monthly status reports shall be delivered by the Contractor to the Government.

		tool.	return the completed directory within 14 days of receiving substitutions.	
US4	Customers: - have available systems for placing requests for information interactively. - shall receive electronic confirmation automatically when their request is received. - help desk staff and designated government employees have access to status information and metrics on all previously placed requests. Help desk : - staff and designated government - designated government employees shall have the ability to generate automated mailing lists, both email and street address based, by querying the system based on specific categories, including product and service, location, or other common fields.	The Contractor shall deliver a web-based customer service request and tracking tool. This tool shall provide for work order generation and forwarding, assigning of tasks to specific personnel and tracking of performance, and for standard querying and reporting capabilities. It is strongly recommended that the Contractor view 3 similar systems already in development or in place throughout NESDIS for potential use or incorporation: (1) The Comprehensive Large Array-data Stewardship System (CLASS) (2) The NOAA Virtual Data Center Online Store (3) The DCS Automated Processing System (DAPS ii) The Contractor	A design for a web based customer service request tool shall be presented to the government within 90 days of contract award. The government will review within 30 days of receipt of the preliminary design, and the Contractor shall implement all government required changes into the design within 30 days. A completed system shall be delivered to the government within 180 days of approved system design.	The Contractor shall present monthly status reports to the government. A Preliminary Design Review (PDR) shall be held within 60 days of Task Order award. A Final Design Review (FDR) shall be held within 120 days of Task Order award.

		shall consider the results of the OSDPD Customer Service Consolidation Study in developing and implementing this system.		
US5	Customers shall have access to a "central" customer service web page, organized by subject category and product and service name at a minimum.	The Contractor shall develop a series of customer service web pages, organized by subject category and product or service name. These pages shall link to official product and service web pages as designated by the products and services experts. The Contractor shall identify deficiencies, or non-existent web pages for the government, and shall develop "place-holder" pages for the product or service until an official page is developed.	The Contractor shall deliver an outline of a web page design, including product and service categories to be covered, within 90 days of Task Order award. The Contractor shall deliver a prototype "shell" web page within 120 days of Task Order award. The Contractor shall deliver a completed web page, including all links to all product and services web pages, within 180 days of Task Order award.	Monthly reports shall be submitted to the Government. A web page "outline" shall be submitted for government approval within 90 days of Task Order award. A "shell" web page shall be submitted for government approval within 120 days of Task Order award. A completed series of web pages shall be submitted to the government for approval within 180 days of Task Order award.
US6	Help desk staff and designated government employees have access to electronic or other feedback from OSDPD customers.	The Contractor shall develop, for government approval, an online customer satisfaction feedback form. The form shall	A draft customer satisfaction feedback form shall be presented for government approval within 120 days after Task Order award. The	Monthly reports shall be submitted to the Government. A draft feedback form will be submitted to the Government within 120 days after Task

	Customers express satisfaction with help desk service, and web page accuracy, helpfulness, and ease of use.	include categories for help desk service, web page accuracy, helpfulness, and ease of use, and product and service suitability and quality. The forms will be accessible, for viewing only, (except for an "action taken" category, if appropriate) by help desk staff and designated government employees.	Government will respond to draft within 30 days of receipt. The revised form, including government feedback, shall be presented for government approval within 30 days of receiving revisions.	Order award. A revised feedback form will be submitted to the Government within 30 days after receiving government revisions

(ESPC Applications Support Outcomes Matrix)

	_Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring Method**
AS1	Problems with application support functions, that disrupt production processing, will be resolved as soon as possible.	The Contractor shall assist in diagnosing and resolving problems with the application support functions.	- Production processing flow shall not be interrupted for more than 2 hours in a day, and no more than 4 hours in a month. - Operator monitoring of production processing shall not be interrupted for more than 2 hours in a day, and no more than 4 hours in a month. - Distribution of production data shall not be interrupted for more than 2 hours in a day, and no more than 4 hours in a month.	Operator logs
AS2	Application support functions can be modified to fix problems, or to implement new requirements.	The Contractor shall assist in maintaining the application support functions.	Tasks to modify the software are completed on time, and the software changes work as expected.	- Status reports and status meetings - Analysis of designs - Analysis of processing after change is made
AS3	ESPC will support automated testing and reprocessing of data, when needed.	The Contractor shall assist in implementing automated parallel testing environments, and automated reprocessing of data, when necessary, without impacting	Automated testing and reprocessing of data is performed successfully, without impacting production.	Logs Feedback from GTMs and users

		production processing.		
AS4	Users of ESPC systems will receive assistance with problems and with the use of the systems.	The Contractor shall assist users with program design, programming problems, integration of programs into the production processing environment, and use of system facilities.	Users are given good direction on program design and are receiving the help they need. Programs are integrated properly into the production environment.	Analysis of the assistance and solutions being given to users Feedback from GTMs and users

(ESPC Systems and Network Administration Outcomes Matrix)

	Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring Method**
SA1	ESPC systems are functional and available for use	The Contractor shall install and maintain system software and third party software listed in URL <http://projects.osd.noaa.gov/espc/documentations.htm>.	Quality: Tasks completed on time and systems perform as expected Reliability: 99.9% tasks are scheduled and scheduled tasks are completed	Quality: NESDIS review of system performance log, system log Reliability: NESDIS review of schedule tasks and syslog
SA2	ESPC is able to plan for new systems, and for changes to existing systems	The Contractor shall support technical planning for new systems, new interfaces to systems, new system requirements, and relocation of systems		
SA3	Problems with production systems will be resolved as soon as possible	The Contractor shall analyze problems with productions systems, and propose solutions		

		or workarounds that will allow production processing on the systems to continue		
SA4	The performance utilization of ESPC system resources will be known	The Contractor shall monitor and provide reports on the performance and utilization of ESPC system resources, and make recommendations for improvement		
SA5	ESPC systems will be secure	The Contractor shall follow ESPC (DOC/NOAA/NESDIS) procedures and policies for securing ESPC systems	An ESPC system, or ESPC data, will never be compromised	
SA6	ESPC systems will be managed according to ESPC policies	The Contractor shall implement ESPC policies for system management, including: backup/recovery, storage management, data management, access control, and workload management		

	Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring Method**
SA7	Reactive Software Maintenance -All unexpected software problems and networking problems will be	The Contractor shall resolve problems in the receiving, processing, monitoring, and	During normal working hours, within 1 hour of problem discovery, the Contractor shall notify the GTM of	Use Daily Monitoring Reports and recorded time of Contractor notification of GTMs

	resolved as quickly as possible	delivery of satellite data to users	the status of the problem resolution If problem is internal to application software systems and the problem is impacting product delivery or product quality then the problem shall be resolved within 24 hours of discovery	GTM will verify that the Contractor resolved the problem within 24 hours of discovery
SA8	User Support - Time to resolve problems or respond to customer inquiries is as short as possible to minimize impact on user community	The Contractor shall respond to GTM within 24 hours of receiving customer inquiries with steps to be taken for resolution	Contractor shall complete the agreed upon actions as identified	NESDIS use of daily monitoring reports, weekly reports, and status meeting reports
SA9	Assigned tasks are completed on schedule	The Contractor shall complete assigned maintenance tasks on or before the mutually (GTM and Contractor) agreed upon due dates	100% of the time the Contractor shall complete the assigned tasks on or before the due date	Use of task manager system, regular status meetings, and weekly status reports

(ESPC Data Distribution Access Outcomes Matrix)

	Desired Outcomes	Required Service	Performance Standard	Monitoring Method
DD1	Ability to maintain ESPC TCP/IP protocols for the systems and internal data and clock networks	The Contractor shall Manage and maintain ESPC TCP/IP protocols for the systems and internal data and clock networks	Reliability: 99.9% networks uptime per week	NESDIS inspection of system logs
DD2	Ability to maintain network devices and servers	The Contractor shall maintain network devices and servers, which are redundant with spare units or backup	Reliability: 99.9% network devices and servers uptime per week	NESDIS inspection of system logs
DD3	Ability to maintain the ESPC external data networks	The Contractor shall maintain the ESPC external data networks, domestic and international with backup circuits for some and Internet fall back for others	Reliability: 99% external networks uptime per week	NESDIS inspection of system logs
DD4	Contractor shall automate report gathering functions	Syslog report highlight of desired areas (probes, intrusions, failures, etc) formatted similar to open source parsing tools where incidents types, number and percentages are reported in columnar order.	Completeness: automated tasks shall be initiated by an automated scheduler Reliability: 99.9% of scheduled tasks will execute on time.	Completeness: NESDIS inspection of scheduler reports Reliability: NESDIS inspection of performance logs
DD5	Work to automate system fail-over capability	Analyze and implement automatic fail-over where is required	Reliability: 99% of system fail overload capability has been automated.	NESDIS analysis of system performance logs
DD6	Assigned tasks are completed on	The Contractor shall complete assigned	100% of the time the Contractor shall	Use of task manager system, regular

	schedule	maintenance tasks on or before the mutually (GTM and Contractor) agreed upon due dates	complete the assigned tasks on or before the due date	status meetings, and weekly status reports

(ESPC Product Systems Maintenance Desired Outcomes)

	Desired Outcomes	Required Service	Performance	Monitoring Method
PS1	Reactive Software Maintenance. All unexpected product systems (applications) software problems and networking problems will be resolved as quickly as possible.	The Contractor shall resolve problems in the operational/ production processing, monitoring, and delivery of satellite data to primary users.	During normal working hours, within 1 hour of problem discovery, the Contractor shall notify the GTM of the status of the problem resolution Within 3 hours of problem discovery during non-normal working hours, the Contractor shall notify the GTM of the status of the problem resolution. If problem is internal to application software systems and the problem is impacting product delivery or product quality then the problem shall be resolved within 2, 12 or 24 hours of discovery, depending on assigned Tier.	Use Daily Monitoring Reports and recorded time of Contractor notification of GTMs. GTM will verify that the Contractor resolved the problem within Tier Return to Service time limits.
PS2	Product completeness. All nominal quality level 2 and level 3 products are successfully produced from all nominal input data.	The Contractor shall ensure that all level 2 and level 3 products are successfully produced and of expected quality. Contractor shall provide means to measure product completeness.	98% of normal POES input data and 99% of GOES input data shall be processed successfully and products of expected quality shall be delivered to users.	Processing logs (execution reports) and monitoring reports showing data in vs. data processed.

PS3	Satellite Analysis Branch (SAB) support shall be provided 24x7.	Response to SAB issues shall be immediate.	The Contractor shall respond to SAB immediately upon receiving a problem report. Normal operations shall be restored within 2 hours.	Monitoring of SAB and problem report logs. Customer feedback.
PS4	User Support - Time to resolve problems or respond to customer inquiries is as short as possible to minimize impact on user community	The Contractor shall respond to GTM within 24 hours of receiving customer inquiries with steps to be taken for resolution.	Contractor shall be expected to complete the agreed upon actions as identified.	Use of daily monitoring reports, weekly reports, and status meeting reports.
PS5	Assigned tasks are completed on schedule	The Contractor shall complete assigned maintenance tasks on or before the mutually (GTM and Contractor) agreed upon due dates	100% of the time the Contractor shall complete the assigned tasks on or before the due date	Use of task manager system, regular status meetings, and weekly status reports.
PS6	Product systems software meets operational and functional standards.	The Contractor shall prepare software to comply with NESDIS standards.	100% of the Contractor written software systems shall comply with NESDIS software standards. Non-compliant legacy software will be identified to the COR and corrective action will be agreed upon.	Review of project reports and periodic inspection of software by GTM or designated representative.
PS7	Software Configuration Management (CM) system are in place and followed.	Software maintenance shall comply with CM procedures.	100% of operational software will be maintained under CM systems.	Review of CM policies, procedures and software by GTM or designated representative.
PS8	Product systems documentation meets operational	The Contractor shall prepare documentation,	100% of the Contractor written documentation shall	Review of system documentation by GTM or designated

	and functional standards.	which is complete and accurate, properly stored, indexed and kept current. Documentation shall comply with NESDIS standards.	be complete, accurate, current, and comply with NESDIS standards. Contractor shall store 100% of documentation in online, indexed system. Non-compliant legacy documentation shall be identified to the COR and corrective action will be agreed upon.	representative to ensure compliance and ensure the documentation reflects the current state of the system.
PS9	Product systems shall include FGDC compliant metadata with remote sensing extensions.	The Contractor shall prepare metadata which is complete and accurate, and shall comply with FGDC standards with remote sensing extensions.	100% of the product systems shall as a minimum include static metadata, which shall be complete, accurate, current, and comply with FDGC standards.	Review of product metadata by GTM or designated representative to ensure compliance and ensure the metadata reflects the current state of the system.

(ESPC OSEI Desired Outcomes Matrix)

Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring**
Operational Significant Events Imagery (OSEI) created, provided to public and government officials, indexed and archived.	The Contractor shall create daily OSEI imagery with metadata of interesting environmental features, as well as respond to significant events as required by the government.	At least one OSEI image will be created each workday. The Contractor shall respond immediately during business hours, and within 2 hours during non-business hours, to begin the creation of OSEI imagery during significant events.	Review of OSEI indexed website and project reports and periodic inspection of image quality by GTM or designated representative.

(ESPC Shared Processing Outcomes Matrix)

Desired Outcomes	**Required Service**	**Performance Standard**	**Monitoring Method**
Reactive Software Maintenance - All unexpected software problems and networking problems will be resolved as quickly as possible.	The Contractor shall provide staff to resolve problems in the receiving, processing, monitoring, and delivery of satellite data to users.	During normal working hours, within 1 hour of problem discovery, the Contractor shall notify the GTM of the status of the problem resolution.	Use Daily Monitoring Reports and recorded time of Contractor notification of GTMs.
If problem is internal to application software systems and the problem is impacting product delivery or product quality then the problem shall be resolved within 24 hours of discovery.		GTM will verify that the Contractor resolved the problem within 24 hours of discovery	
Daily Processing -All good data received should be processed and distributed to users so that it meets agreed upon timeliness requirements	The Contractor shall monitor performance, produce statistics, and make appropriate system adjustments to meet timeliness requirements	100% of all good data shall be processed through IPD systems	Use daily processing statistics
User Support - Time to resolve problems or respond to customer inquiries is as short as possible to minimize impact on user community	The Contractor shall respond to GTM within 24 hours of receiving customer inquiries with steps to be taken for resolution.	Contractor shall be expected to complete the agreed upon actions as identified.	Use of daily monitoring reports, weekly reports, and status meeting reports.
Shared Processing errors, or problems will be resolved such that the impact on the user community is avoided or minimized.	The Contractor shall provide staff to monitor performance, produce statistics, and resolve operational/production processing of SPP data.	Within 1 hour during normal working hours and within 3 hours of non-normal working hours of the problem discovery, the Contractor shall notify the GTM of the status of the problem.	Use Daily Monitoring Reports (oral and email)
Assigned tasks are completed on schedule	The Contractor shall complete assigned maintenance tasks	100% of the time the Contractor shall complete the assigned	Use of task manager system, regular status meetings, and weekly

	on or before the mutually (GTM and Contractor) agreed upon due dates	tasks on or before the due date	status reports.

(ESPC Satellite Analysis and Hazards Support Outcomes Matrix)

Desired Outcome	Required Service	Performance Standard	Monitoring Method
Support for Satellite Analysis Branch in accordance with SAB Standard Operating Procedures	The Contractor shall provide 24x7 support to the Satellite Analysis Branch by assisting in the routine product generation, daily operational tasks and office support, and non-operational support tasks	Operational product generation will conform to the discipline-specific metrics published in the SAB procedures documentation. Completion of non-operational support tasks will adhere to schedules determined by SAB Team Leads and the GTM 80% of the time	Performance of the contractor will be reviewed monthly by the SAB GTM. Daily functions of the Contractor will be monitored by the SAB Shift Supervisor.

(ESPC CIP Outcomes Matrix)

Desired Outcomes	Required Service	Performance Standard	Monitoring Method
Deliver a Business Continuity Plan (BCP) utilizing the CIP at Wallops Island, VA as a backup site.	The Contractor shall develop a BCP with assistance of the government utilizing the CIP site in Wallops Island, Virginia as the backup processing center for the ESPC. This plan shall include, but not be limited to cyclic maintenance of software and data repositories located at the Wallops Island site are synchronized with changes and	This draft plan shall be completed within six (6) calendar months of Task Order award. It shall be reviewed by the government within thirty (30) calendar days, and the Contractor shall finalize the move plan within thirty (30) calendar days of final government review.	The Contractor shall provide a weekly status report (oral and/or email) and conduct a monthly Contractor status review.

	data residing in the ESPC site in Suitland, Maryland at intervals stipulated in the BCP.		
Update the Business Continuity Plan (BCP) to reflect any required changes at the direction of the government.	The Contractor shall update the BCP with assistance of the government not more frequently than semi-annually.	This updated BCP shall be completed within forth-five (45) calendar days of request by the government. It shall be reviewed by the government within fifteen (15) calendar days, and the Contractor shall finalize the move plan within fifteen (15) calendar days of final government review.	The Contractor shall provide a weekly status report (oral and/or email) and conduct a monthly Contractor status review.
Exercise the activation of the Wallops Island, VA CIP site at the direction of the government.	In accordance with the BCP and with the assistance of the government, the Contractor shall commence mission critical operations at the CIP site in Wallops Island, VA.	The CIP site in Wallops Island, VA shall be ready to assume mission critical ESPC functions within twenty-four (24) hours of being notified to activate the backup site.	Checklists included in the BCP and Continuity of Operations Plans (COOP) shall be utilized and annotated to ensure backup activation procedures are adequate and correct.