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Office of the Chief Information Officer

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**ENTERPRISE SERVICE MANAGEMENT (ESM):**  
**CONCEPT OF OPERATIONS**

### Table of Revisions

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<ul style="list-style-type: none"><li>• Incorporate Cliff's comments following initial delivery</li><li>• Incorporation of SE&amp;I functions into overall design</li><li>• Graphics replaced to reflect OCIO Governance Presentation</li></ul>	3/25/2009

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## EXECUTIVE SUMMARY

### Purpose of ConOps

This document, a Concept of Operations (ConOps), is the conceptual design of NASA Enterprise Service Management (ESM) providing high level descriptions of how ESM will be organized and how it will work. The ConOps is intended to be a tool to support NASA management in the planning and establishment of ESM. It is also intended to assist in the implementation of ESM and to assist with the communication of changes to the appropriate NASA community.

The ConOps provides the operational structure of the “end point” ESM, what it will look like when the Information Technology (IT) Service Management (ITSM) implementation at NASA is mature. It does not address the transition to a mature model nor does it provide the details of day to day ESM activities. The ConOps does provide the framework of how ESM fits into, and interrelates with, the NASA organizational structure, and provides the ESM Charter and purpose; the policies of ESM; the suggested staffing, including roles, responsibilities, staff profiles and size.

### Background

NASA has recognized a need to change how it delivers IT services. Given today’s challenges of increased dependency on IT services to support the NASA mission, higher expectations for services by the users, combined with the increased complexity of the infrastructure and increased service costs, the current way of delivering IT services has to change. The change cannot be addressed just through technology.

NASA has chosen to address these challenges by implementing the industry best practices of the IT Infrastructure Library (ITIL) as the new IT operating model. As part of the implementation, the creation of ESM is needed.

### Purpose of ESM

The charter of ESM is to provide a NASA service support environment that optimizes the ITIL best practice processes for implementing formal ITSM.

The groups involved in ESM functions will govern, manage and oversee the ITSM implementation of IT services from strategic inception, through design, transition to production, operations in production and service retirement.

The scope of ESM will be both strategic and tactical. Strategically it will provide ITSM leadership in NASA’s adoption of ITSM and delivering enterprise wide IT services; it will provide governance by establishing decision rights, accountability and encouraging desired IT behavior; it will provide management to drive the adoption of ITSM. Tactically, ESM will focus on ITSM management and communication, working within NASA and with the Service Suppliers. The groups involved in ESM will own the quality of the IT services by focusing on Service Design, Service Transition and Continuous Service Improvement (CSI). During Service Design, ESM will focus on negotiating and managing Service Level Agreements (SLAs), facilitating Service Design, Supplier Management and Service Catalog Management. During Service Transition ESM will focus on Knowledge Management and on Service Evaluation, performing the Independent Validation and Verification (IV&V) to ensure

ITIL standard processes are implemented properly and are cost effectively, and that the service requirements/specifications are satisfied. During CSI, ESM focuses on Service Measurement and Reporting, using the information for continuous improvement of the services. The groups involved in ESM will also have an operational function of overseeing the Enterprise Service Desk (ESD) and leading major Incident escalations (outages).

## Overview of ESM

ESM will reside in the Office of the Chief Information Officer (OCIO) and will report directly to the NASA Chief Information Officer (CIO.)

## ESM Design Approach

One factor that should always be considered when implementing a major cultural change is: the less change to the existing organizational structure, the more receptive personnel will be to the change. To better fit the current NASA organization the groups involved in ESM will be organized by the ITIL lifecycle, a new concept introduced in ITIL version 3 which provides for comprehensive management of the ITIL framework as well as minimizing organizational change.

## Organization of the ESM

The ESM will have an overall goal to deliver quality IT service. To achieve the overall goal, ESM will involve four organizations: Service Integration Management (SIM); Enterprise Architecture (EA); Systems Engineering & Integration (SE&I); and the Project Executives.

The SIM will have two main goals:

- To evangelize and drive the enterprise delivery of IT services throughout NASA
- To monitor and improve IT services and ITIL Processes

The SIM will focus on CSI and Service Transition, including Organizational Change Management. The SIM will be responsible for ensuring that new processes are properly planned, built, and deployed. Once deployed, all services and processes are subject to continuous improvement.

The SIM will own all ITIL processes. Process Managers will work with the SIM to ensure that the processes are regularly tuned and functioning accordingly. The majority of the processes will not be executed in the SIM, but within NASA IT by its Service Suppliers. Process metrics are provided to the SIM for review, reporting and possible action. The Service Level Management process is executed by the SIM as is Service Catalog Management. While much of the work of Service Transition occurs outside of the SIM, Evaluation and Knowledge Management are also included in the SIM. Organizational Change Management, within the SIM, orchestrates the cultural change in NASA IT.

EA will continue to be responsible for Service Strategy.

SE&I will be the day-to-day operational arm of ESM. SE&I will be responsible for ensuring that new services are properly planned, built, and deployed. Once deployed, all services are subject to continuous improvement under the SIM.

The Project Executives will be responsible for oversight of the Service Operations Lifecycle phase. This organization will also include leadership of Incident escalations (outages.)

ESM will be accountable for:

- IT service strategy, design, and transition
- Oversight of daily operations
- Supplier and Customer Relationship Management
- Continuous process and service improvement

The ESM will be responsible for:

- Enterprise IT Strategy, Architecture, and Service Portfolio
- Management of the SIM, Project Executives and Enterprise Architecture

## Policies

ESM functions will be guided by the following design policies:

1. Accountability is clearly defined – from strategy development through activity execution
2. Decision rights are unambiguous at all levels of the organization
3. ESM leadership sets, and communicates, the standard for desired organizational behavior
4. ESM drives the ITIL lifecycle stages
5. The SIM deploys ITIL based processes
6. The scope of each ITIL process is NASA Enterprise wide
7. Each process is exclusive –there is only one instance of each ITIL process across the Enterprise
8. ITIL processes exist independently of the organizational geographical boundaries
9. The underpinning ITSM architecture supports reporting of any requested process or IT service metric and Key Performance Indicators (KPIs)
10. NASA owns all the ITSM processes
11. NASA owns Agency/Enterprise ITSM services
12. Process managers are overseen by their corresponding Process Owners and ESM participants. A select few process managers will execute their processes from within the organizations responsible for ESM
13. The SIM is the day-to-day management arm of ESM
14. The SIM is responsible for driving NASA IT continuous improvement using ITIL processes
15. The SIM is responsible for driving the design and launch of each ITIL process

## Staffing

The roles defined in the ConOps will support NASA's ITSM rollout. Roles are not positions nor are they job descriptions. Roles are abstractions which allow the definition and assignment of specific, related, activities to produce defined outcomes. An individual may be responsible for more than one role.

The ConOps defines a number of roles. These roles are mapped to positions. Typically multiple roles are mapped to a single position. Fully staffed, ESM requires eleven (11) FTE/WYE positions. Most of the positions can be staffed by full time equivalent (FTE) or work year equivalent (WYE) personnel with the exception of the Policy and Investment position which must be filled by a Civil Servant. NASA will staff the positions by leveraging from the existing NASA personnel, when and where possible.

## Measurements

As a best practice, an organization must be able to measure its progress, quantify IT's success and identify areas for improvement. Each ITIL process will have metrics to measure its efficiency and effectiveness.

- Effectiveness (i.e., producing the intended or expected result) measures may include: number of changes to a system; number of incidents resolved.
- Efficiency measures (i.e., performing or functioning in the best possible manner with the least waste of time and effort) may include: IT cost per user; IT cost per service; number of incidents as a result of a change; first call resolution rate.

## Summary

In summary, deploying ITSM and ITIL is a positive strategy for NASA. Designing ESM activities to ensure effective management of effort is essential. This ConOps document provides additional depth to the topics discussed in this NASA ConOps Executive Summary.

## I. PURPOSE OF CONCEPT OF OPERATIONS

A Concept of Operations (ConOps) describes the characteristics of a proposed system from a user viewpoint. It offers a methodology to realize the goals and objectives, but is not intended to be a detailed design, or an implementation or transition plan. It is used to communicate the quantitative and qualitative characteristics of a system to stakeholders.

This ConOps provides a high-level conceptual description of NASA Enterprise Service Management (ESM), functions which are needed to manage NASA's implementation of Information Technology (IT) Service Management (ITSM). It establishes the operational framework of "end-point" ESM stated in present tense, when the ITSM model has been implemented at NASA.

Reasons for developing a ConOps:

- Obtain stakeholder understanding of how ESM will function; who is responsible for what; and what the lines of communication will be
- Define the high-level concepts of ESM
- Define the environment in which ESM will operate
- Derive high-level requirements
- Provide the criteria to be used for validation of ESM with use cases

### 1.1 CONTENTS

The contents of this ConOps include:

- **Executive Summary:** Provides a brief overview of the major topics in this document
- **Section 1:** Purpose of the ConOps describes the contents of the document, the intention of the document and intended audience
- **Section 2:** The scope of ESM provides the purpose of ESM, and a high level scope description
- **Section 3:** Referenced Documents provides a listing of the documents used to develop the ConOps
- **Section 4:** Background of ESM provides the history of ESM and the ITSM implementation, the current situation at NASA, the nature of the upcoming change, the justification for the change and an brief introductory overview of IT Infrastructure Library (ITIL) version 3 and ITSM
- **Section 5:** Concept for NASA ESM includes the approach for the concept, ESM Charter, the policies to be implemented, the management structure and organization of ESM, roles and responsibilities, the ITIL process architecture, the governance of ESM, a discussion of tools which will be used to support ESM activities and measurements which will be used to gauge the success of ESM and implementation of ITSM
- **Section 6:** Operational Framework describes how ESM will fit within NASA's structure, its links to other organizational groups, information on the types of communications needed and information to support the training and awareness campaigns
- **Section 7:** ESM Staffing Recommendation provides information on the resource requirements for ESM, staffing profiles and recommended staff size
- **Section 8:** Use Case Scenarios provides nine use cases which demonstrate how ESM will operate in various situations

- **Appendix of Acronyms:** Provides aid to the reader with the many acronyms used throughout this document
- **Appendix of ITIL Overview:** Provides a primer to the reader on the fundamentals of ITIL

## 1.2 INTENT

As a concept document, the intent of the ConOps is to provide a high-level description of what ESM will look like and how it will work. It is intended to be used primarily as a tool to support the decision making process for the establishment, planning and design for NASA ESM. It will also be used as a communication resource to stakeholders and other interested parties on the organizational structure, the roles and responsibilities and the operational processes of ESM. It can be used as a resource for the development of a ESM Design Implementation Plan. Once ESM is implemented and fully operational, this document will be relevant as a historical reference.

## 1.3 AUDIENCE

The audience of the ConOps is the stakeholders of the NASA ITSM implementation:

- Upper Management - for design and planning decisions
- Initial ESM or Service Integration Management (SIM) members – for development of a ESM Design Implementation Plan and implementation
- NASA IT and Center staff – for communication and education

## 2. SCOPE OF ENTERPRISE SERVICE MANAGEMENT

This section defines the scope and the reach of ESM, the purpose and activities of ESM and the high level description of what ESM is. Additional depth concerning ESM activities and description can be found in Section 5.

### 2.1 SCOPE

The scope of ESM is both strategic and tactical. Strategically, ESM deals in ITSM leadership, governance and management across all of NASA by providing services to IT customers NASA wide. Tactically, the ITIL processes owned by the ESM extend enterprise-wide down to and including Service Suppliers.

### 2.2 PURPOSE OF THE ESM

The groups involved in ESM govern, manage and oversee ITSM throughout the ITIL service lifecycle from strategic inception, through design, transition to production, production operations and finally to service retirement. A more detailed description of ITSM can be found in Appendix B. ESM spans strategic, tactical and functional activities as identified in the following sub sections.

#### 2.2.1 STRATEGIC ACTIVITIES

ESM's overall purpose is to lead NASA's adoption of ITSM and deliver IT services enterprise wide. While EA takes an overarching strategic stance on NASA's strategic architecture (i.e., identifying suitable technology and future service directions), ESM's strategic position will be to leverage the operational performance histories and improvement opportunities identified by the PE and SIM communities and provide guidance and recommendations that may be incorporated into future process, organization, sourcing and service instantiations. It is important to note that ESM's strategic position is the betterment of services and resulting customer satisfaction. In doing so, ESM utilizes the following ITIL Service Strategy concepts:

- Service Strategy
  - ESM determines which services are most appropriate for NASA IT customers
- Service Economics
  - ESM reviews service cost in relation to service value and need
- Service Organization
  - ESM examines appropriate service sourcing and service delivery mechanisms

#### 2.2.2 TACTICAL ACTIVITIES

Tactically ESM focuses on ITSM management and communication. The groups involved in ESM own the quality of IT Service, and focuses on the following three ITIL lifecycle phases:

- Service Design
  - ESM focuses on the negotiation and management of SLAs, facilitating Service Design, Supplier Management and Service Catalog Management
- Service Transition

- ESM focuses on Knowledge Management and on the Evaluation process which performs the Independent Validation and Verification (IV&V) function to ensure all standard processes are implemented properly and cost effectively
- Continual Service Improvement
  - The ESM operational arm, the SIM, focuses on Service Measurement and Reporting, and continuous improvement

### 2.2.3 OPERATIONAL ACTIVITIES

Operationally (see Figure 1), ESM focuses on ITSM oversight and driving the adoption of specific ITIL processes. Operationally, ESM focuses on the ITIL lifecycle phase of Service Operation. In addition, ESM leads are responsible for incident escalations (outages) and oversight of the Enterprise Service Desk (ESD).

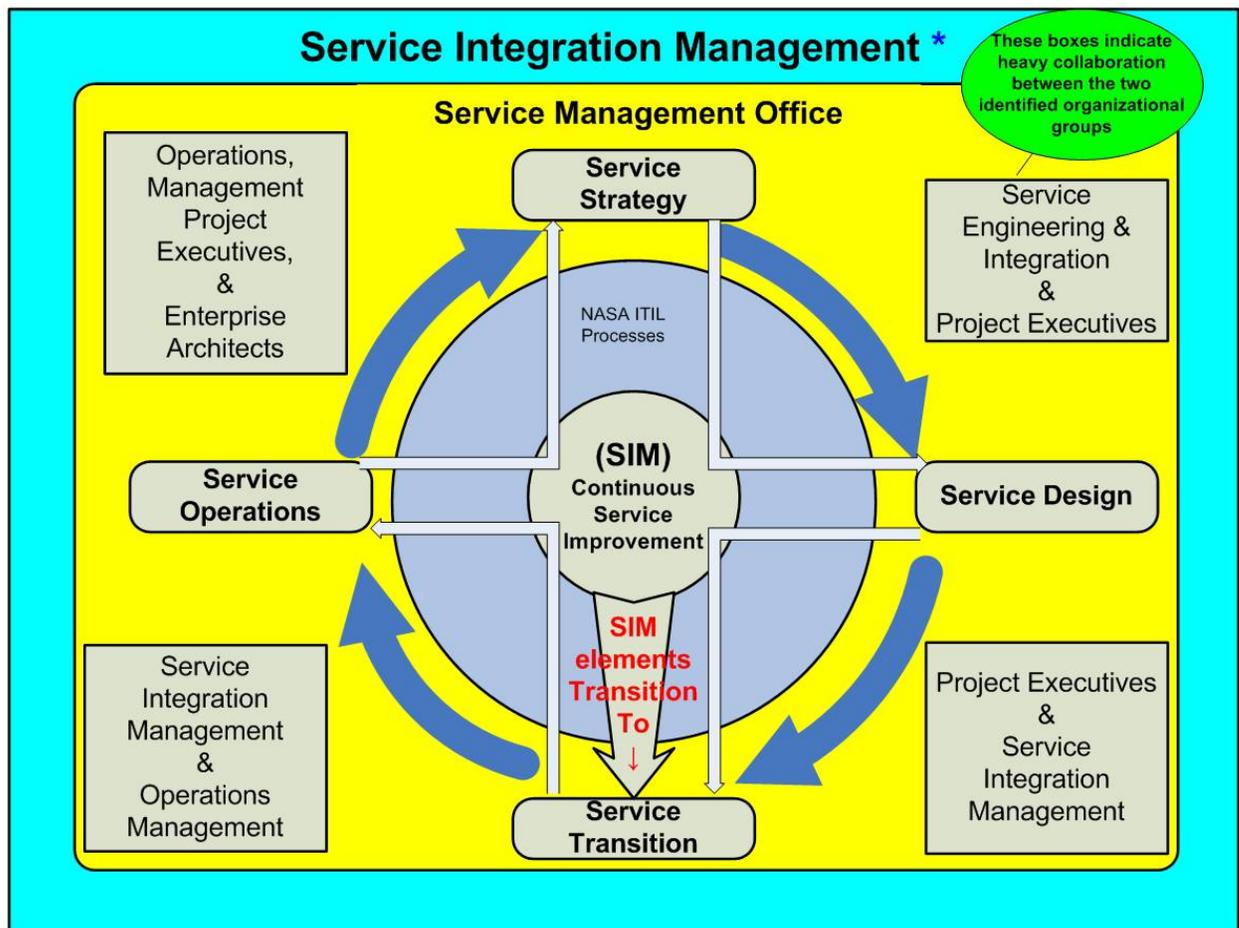


Figure 1 – Service Management In Relation To ITIL Lifecycle Phases

## 2.3 HIGH-LEVEL DESCRIPTION OF ESM

The organizations responsible for ESM are in the Office of the Chief Information Officer (OCIO) and report directly to the NASA CIO.

ESM owns the ITIL processes that coordinate IT activities across the NASA enterprise. These processes coordinate the activity of others outside of ESM, and enable the key ESM roles to be efficient and effective. Also, ESM organizational elements own the IT services themselves, enabling ESM to champion service quality throughout the enterprise.

ESM has an overall goal to deliver quality IT service across the five ITIL lifecycle phases. ESM has three elements that address the five ITIL lifecycle phases as seen in Table 1 below. Further detail of this can be found in Section 5.4.

**Table 1 - ITIL Lifecycle Phase Responsibility**

ESM Organizational Element	ITIL Lifecycle Phase
Enterprise Architecture	<ul style="list-style-type: none"> <li>• Service Strategy</li> </ul>
System Engineering & Integration	<ul style="list-style-type: none"> <li>• Service Design (Owns)</li> </ul>
SIM	<ul style="list-style-type: none"> <li>• Service Transition</li> <li>• CSI</li> </ul>
Project Executives	<ul style="list-style-type: none"> <li>• Service Design (Supports)</li> <li>• Service Owners (Financial)</li> </ul>

### 3. REFERENCED DOCUMENTS

**Table 2 - Referenced Documents**

Source	Title	Version	Date
CIO Council	Federal Enterprise Architecture	1.0	Feb 2001
DHS	Homeland Security Presidential Directive/ HSPD-12		Oct 25, 2007
INB	Information Technology – Service Management – Part 1: Specification (ISO/IEC 20000-1)		2006
NASA	Enterprise Service Catalog	7.7	Oct 2008
NASA	Enterprise Service Catalog PowerPoint Presentation		Oct 31, 2008
NASA	Information Resources Management (IRM) Strategic Plan		Sep 2007
NASA	IT Infrastructure Integration Program (I3P) Acquisition Power Point Presentation		Jul 23, 2008
NASA	IT Service Management Update PowerPoint presentation		Jan 15, 2009
NASA	Main Organization Chart		May 2008
NASA	NASA Transition Strategy	2.1	Feb 2008
NASA	Office of the Chief Information Officer (CIO) Organization		Downloaded from web site Dec 11, 2008
NASA	Strategy for Improving IT Management at NASA		Dec 2007
OGC	Service Strategy	ITIL v3	May 2007
OGC	Service Design	ITIL v3	May 2007
OGC	Service Transition	ITIL v3	May 2007
OGC	Service Operation	ITIL v3	May 2007

Source	Title	Version	Date
OGC	Continual Service Improvement	ITIL v3	May 2007

## 4. BACKGROUND OF ENTERPRISE SERVICE MANAGEMENT

The CIO for NASA is charged with the strategic management and transformation of information and technologies that are imperative to effectively realizing the Agency's mission. Seamless collaboration of the NASA workforce across multiple locations is vital in the planning, design, and development of exploration related capabilities and technologies.

As in many government agencies there are evolving expectations by management and by users for IT services which are pushing NASA IT toward a new operations model that provides:

- Increased dependency on IT services to support the NASA mission
- Increased visibility of operational issues for enterprise-wide services
- Higher expectations by users for service
- Increased complexity of infrastructure
- Increased visibility of IT service costs and a push to do more with less budget
- increased legislative and regulatory requirements and security mandates

NASA has recognized it must redefine its operational processes in order to deliver IT services across the agency in a seamless, timely and cost effective manner.

### 4.1 HISTORY

In the past, programs and projects operated in a Center-centric manner with little to no interfaces to one or more of the other Centers. Duplication of IT services was costly and many of the infrastructure services were delivered via a different operational model. Varied service levels and nomenclatures were used by service and by location. Delivery of IT services was inefficient, burdensome and frustrating to the user.

### 4.2 CURRENT SITUATION

NASA is going through a fundamental change in how its strategic IT goals are accomplished and this fundamental change to a centralized Service Strategy requires a transformation in IT to support it. A transformation of IT cannot be strictly about technology but must encompass the organizational changes required as well to be successful..

NASA has made the decision to implement a new Operations Model for the delivery of IT services. This effort seeks to standardize NASA's ITSM practices, to align with industry best practices (e.g. ITIL) to yield a set of consistent, repeatable and measurable processes for service delivery to NASA OCIO customers.

### 4.3 NATURE OF UPCOMING CHANGE

To facilitate the transformation of how IT services will be delivered at NASA, ESM will be established at NASA Headquarters to design, implement and manage the IT services throughout their lifecycle. Appendix B provides additional information concerning the lifecycles of IT services.

### 4.4 JUSTIFICATION FOR CHANGE

The "change" addressed in this section is the change required to deploy ESM to lead, govern and manage ITSM. NASA's current I3P effort out-sources NASA enterprise IT services and incorporates a

strategy using ITIL best practices along with a strategy to position IT as an enterprise wide, single, cohesive organization. ESM focuses the discipline necessary to drive ITSM enterprise wide.

The expected ITSM benefits of ESM will include:

- Leadership, governance and management
- Service and process quality
- Service and process ownership

The benefits of ITSM are derived by ensuring that the necessary ITIL processes span the NASA enterprise and by ensuring that all staff know and execute their roles in those processes. Efficiency and effectiveness are increased because there is no overlap, gap or unnecessary activity performed. Further benefits of ITSM are gained by focusing on maximizing service availability, removing errors and providing continuous service improvement. ITSM emphasizes a focus on quality customer service and deemphasizes a focus on technology silos.

Expected benefits of ITSM include:

- Reduced long term IT costs
- Increased quality and consistency of IT service across the NASA enterprise
- Increased responsiveness of IT to customer demand
- Increased IT flexibility to meet changing requirements

## 5. CONCEPT FOR NASA'S ENTERPRISE SERVICE MANAGEMENT FUNCTIONS

This section describes the NASA ESM functions and provides examples of meaningful operational scenarios.

### 5.1 ESM DESIGN APPROACH

The basic functions of ESM are to facilitate, enable and control ITSM and are the same regardless of the organization it exists within. The approach used in the creation of this design ensures that NASA has the organization that best fits its precise and unique requirements. Working with NASA personnel, there are two phases of development: data collection, and iterative modeling feedback and evaluation. The goal was not to document cookie cutter ESM, but rather, to take the concept of ESM and match it to NASA's unique requirements and vision.

The basic structure of an IT organization in relation to ESM can follow several models, but the main consideration when implementing a major cultural change like ESM is - the less change to the existing structure, the more receptive personnel will be to the change. Within the IT industry today, the three most common ESM functional models are organized by:

- Technology
- Services
- Processes

Evaluating NASA, in consultation with NASA personnel, a new functional organizational model was chosen, that is organized by ITIL lifecycle phase. This model is appropriate for NASA, providing for comprehensive management of the ITIL framework as well as minimizing organizational change. Specifics include:

- Performing ESM functions across NASA's: Policy & Investment; Enterprise Portfolio; IT Security; and A&I organizations

### 5.2 ESM CHARTER

The Charter of ESM is to provide a NASA Enterprise service support environment that optimizes the ITIL best practice processes for implementing formal ITSM.

### 5.3 POLICIES

ESM is guided by the following high-level design policies that focus on ESM and SIM:

- Accountability is clearly defined – from strategy development through activity execution
  - **Implication:** There must be no ambiguity in execution responsibilities
  - **Implication:** Roles, responsibilities and accountabilities within the ITSM program are clearly defined
  - **Implication:** People will have clarity on their role, responsibility, accountability and measurement against the overall program objectives
- Decision rights are unambiguous at all levels of the organization

- **Implication:** Decision rights empower staff to have freedom of action and make timely choices for maturing the services and enabling the desired results
  
- ESM leadership sets, and communicates, the standard for desired organizational behavior
  - **Implication:** Consistency in messaging enables staff to understand and perform to the desired ITSM objectives
  
- ESM drives the ITIL lifecycle phases
  - **Implication:** EA drives the Service Strategy lifecycle phases
  - **Implication:** SE&I drives Service Design
  - **Implication:** SIM drives Service Transformation, CSI, and operations
  - **Implication:** ESM oversees Service Operations
  
- NASA deploys ITIL v3 based processes
  
- The scope of each ITIL process is NASA Enterprise wide
  
- Each process is exclusive – there is only one of each process across the Enterprise
  
- ITIL processes exist independently of the organizational boundaries
  - **Implication:** ITIL processes cross organizational boundaries
  
- The underpinning ITSM architecture supports reporting of any requested process or IT service metric and KPIs
  
- NASA owns all the ITIL processes
  - **Implication:** Process Owners reside in the SIM
  
- NASA owns all the IT services
  - **Implication:** Service Owners (PEs) report to the organizations responsible for ESM
  
- The SIM is the day-to-day execution arm of ESM
  
- The SIM is responsible for driving continuous improvement of all IT services and all ITIL processes
  - **Implication:** ESM requires process and IT service metrics and KPIs
  - **Implication:** Service Owners own specification of IT services, the service metrics and KPIs
  - **Implication:** SIM owns ITIL process designs, the process metrics and KPIs
  - **Implication:** SIM is responsible for the day-to-day execution of each ITIL process

- The SIM is responsible for driving the design, launch and continuous improvement of each ITIL process

## 5.4 ESM MANAGEMENT STRUCTURE AND ORGANIZATION

### 5.4.1 HIGH LEVEL VIEW

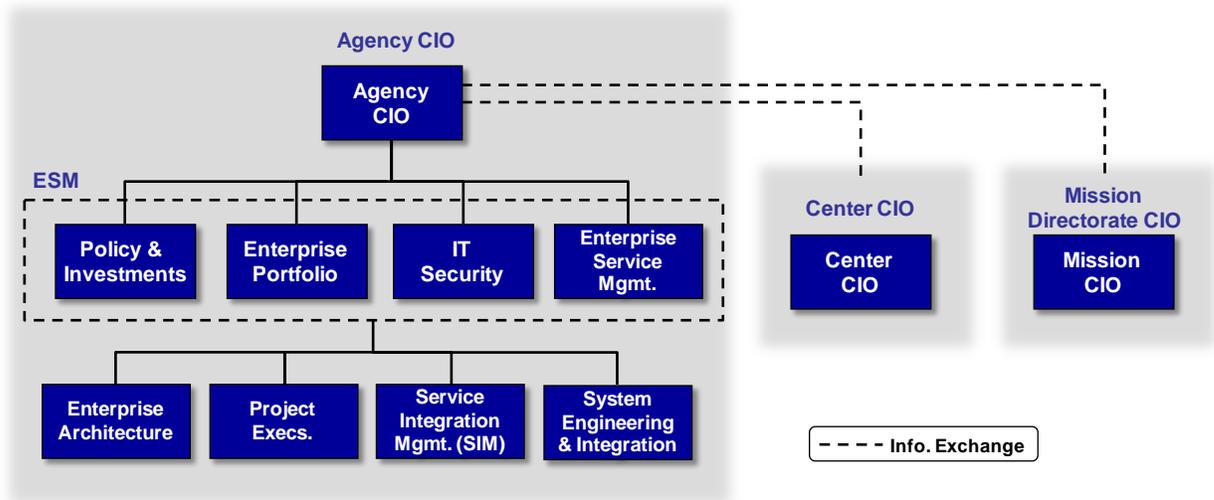
The organizations responsible for ESM will evolve from the current A&I division and interface with all other Agency CIO Divisions as the leading source of service management expertise. In doing do, the ESM service management functional responsibilities will align with the five ITIL lifecycle phases. ESM will involve three organizations: Enterprise Architecture; SIM; and the Project Executives., as shown in Table 3.

**Table 3 - ITIL Lifecycle Phase Responsibility**

ESM Organizational Elements	ITIL Lifecycle Phase
Enterprise Architecture	<ul style="list-style-type: none"> <li>• Service Strategy</li> </ul>
System Engineering & Integration	<ul style="list-style-type: none"> <li>• Service Design (Owns)</li> </ul>
SIM	<ul style="list-style-type: none"> <li>• Service Transition</li> <li>• CSI</li> </ul>
Project Executives	<ul style="list-style-type: none"> <li>• Service Design (Supports)</li> <li>• Service Owners (Financial)</li> </ul>

As illustrated in **Figure 2**, ESM participants report directly to the NASA CIO. ESM does not duplicate, but rather leverages, the existing organization by aligning relevant EA, SIM, SE&I, and PE roles, and linking to existing roles in IT Security Division and Policy and Investments Division respectively. The Center CIOs will serve in Customer Relationship Manager (CRM) capacity, and as such, have a dotted line relationship with ESM participants (in addition to their current relationships).

While ESM organizations are divided into individual parts for organizational functionality, matrix management is practiced throughout. As an example, Measurement and Reporting is a CSI function under the SIM, serving all of ESM. These links and interactions will be defined within the individual processes and procedure design documentation during the design of those processes.



**Figure 2 - High Level ESM**

ESM participants are accountable for:

- IT service strategy, design, and transition
- Oversight of daily operations
- Supplier and Customer Relationship Management
- Continuous process and service improvement

ESM participants are responsible for:

- Enterprise IT Strategy, Architecture, and Service Portfolio
- Management of:
  - SIM
  - Project Executives
  - Enterprise Architecture
  - System Engineering & Integration (SE&I)

## 5.4.2 ENTERPRISE ARCHITECTURE FUNCTIONS

The EA organization is responsible for NASA's service strategy. EA therefore, has responsibility for ensuring that the current-state service catalog evolves to meet future customers' expectations. As part of Service Strategy, EA must work in Concert with the center CIOs, SIM, and PEs to ensure that SE&I customer' requests and opportunities for service improvement are effectively addressed in its service strategy efforts.

### Service Strategy

Service Strategy establishes guidelines for all IT service providers and their customers, by building an initial understanding of:

- what services should be offered
- who will deliver those services
- who the services should be offered to
- how customers will make service sourcing decisions with respect to use of different types of service providers
- financial management associated with the attainment and payment of those services
- support capabilities
- how available resources will likely be optimized across the portfolio of services
- how service performance will be measured
- how security standards and requirements should be incorporated

In large part, the Service Strategy is determined by members of the ITMB:

- **Accountable** – Agency CIO
  - Ultimately, the Agency CIO is the one person accountable for the success of the IT strategy.
- **Responsible** – EA, Center CIOs,
  - EA is responsible for building and maintaining NASA’s services construct (i.e., identifying and mapping the existing services; incorporating requests for modifications to those services; and incorporating new services).
  - The Center CIOs are responsible for listening to the needs of their customer bases, communicating those requirements back to the agency IT community, and ensuring that the overall IT strategy meets the needs of their customers.
- **Consulted** – SIM, Program Management, Finance Office
  - The SIM, Program Management, and Finance Office communities will be consulted and asked provide insight regarding current day service delivery (e.g., what services are being offered today, which services may no longer be necessary to provide, provider), past contract experience (e.g., provider performance, provider reporting), and funding information.
- **Informed** – Project Executives, Mission CIOs, NASA Communications Office (PAO)
  - Although they have limited participation in the development of the service strategy, the Project Executives, Mission CIOs, and NASA Communications Office (PAO) must be informed with regard to the service strategy to ensure their participation (e.g., Service Operations management) later in the service management lifecycle.

### 5.4.3 SIM FUNCTIONS

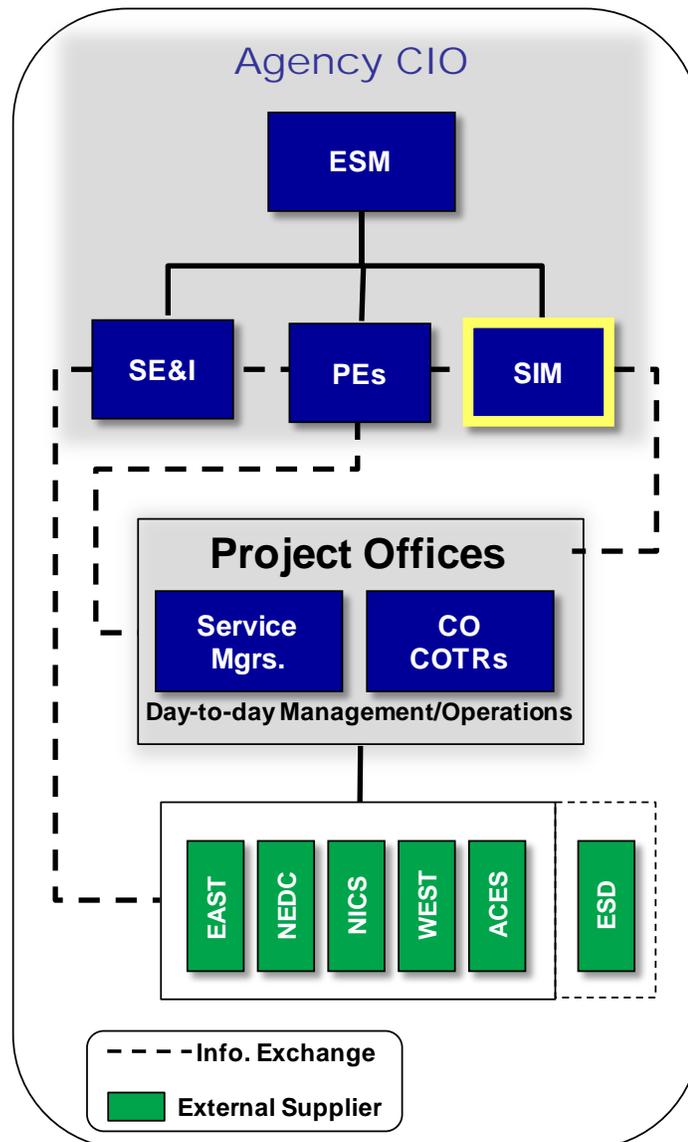
The SIM is the day-to-day operational arm of the ESM and has two main goals:

- To work with the EA and PE communities to design and deliver an Agency applicable Service and Process foundation
- To evangelize, monitor, and improve those IT services and Processes on an on-going basis.

The SIM is focused across three ITIL lifecycle phases to achieve these goals:

- Service Design
- CSI
- Service Transition including Organizational Change Management

The SIM is responsible for ensuring that new services and processes are properly planned, built, and deployed (see Figure 3). Whereas ESM efforts determine which IT services and suppliers are most appropriate for OCIO customers, as well as guiding the management of those responsible for delivering those services, the SIM establishes the standardized set of processes/integration points/and performance measures necessary to ensure that those providing the IT services are doing so in a consistent/repeatable manner, and that the service delivery continues to improve as capabilities mature.



**Figure 3 - SIM Organization**

Although part of the larger ESM functions (see Figure 1 - High Level ESM), because of its diversity and complexity, we believe it is necessary to identify particular SIM functions (articulated below) independently the ESM functions.

### Service Design:

Service Design provides the service details necessary to provide, acquire, and manage IT services for the OCIO customers. In addition to descriptions of the services being provided, service definitions include the service architectures, policies and documentation, supplier requirements, service cost information (where appropriate) and other service information necessary to meet current and future business requirements.

The main goals and objectives of Service Design are to:

- design services to meet agreed to business requirements
  - design secure and resilient IT infrastructures, environments, applications and data/information resources and capability
  - identify those most capable of providing the IT services
  - design service level requirements
  - document NASA's requirements regarding how suppliers are to work with one another
- 
- **Accountable** – ESM.
    - The ESM has ultimate accountability for what IT services are offered (e.g., I3P tower contracts).
  - **Responsible** – SE&I, Project Executives
    - The SE&I and PEs have responsibility for the definitions of those services and their associated service levels across the agency.
    - The SE&I and Project Executives have responsibility for documenting the services and related service components (e.g., service architectures), supplier requirements, and how those suppliers are to work together to ensure service delivery coordination (e.g., cross-functional works statements) across multiple provider environments. Project Executives may be supported by their service managers in this effort.
  - **Consulted** – Agency and Center CIOs
    - The Agency and Center CIOs should be consulted with regard to service design to ensure that the service definitions are in alignment with the service strategy.
  - **Informed** –Mission CIOs, NASA Communications Office (PAO)
    - Although they have limited participation in the development of the service strategy, the Mission CIOs, and NASA Communications Office (PAO) must be informed with regard to the service definitions to ensure that services are utilized effectively across the agency.

### Process Architecture Design:

Process Architecture Design (a subset of General Service Design) seeks to identify processes that may be/should be in place today, and utilizing best practice process information (e.g., ITIL v.3) works to formalize and standardize those processes across the agency. Process architecture design works to establish process standards, from which procedural documentation (i.e., run-books) may be aligned with.

The main goals and objectives of Process Architecture Design are to:

- Identify which processes should be formalized and standardized across the Agency
- Compare current processes/process performance with industry best practices and identify future state process scenarios
- Prioritize process development efforts
  
- **Accountable** – SIM Lead
  - The SIM Lead is accountable for ensuring that the process architecture fits well with other performance and refinement efforts.
- **Responsible** – Process Architect
  - The process architect is responsible for identifying and mapping potential process views/designs.
- **Consulted** – All Others
  - Although the process architect will be responsible for the development of the Agencies IT processes, it is understand that significant input, especially with regard to procedural information, must be collected across the agency, and incorporated into the formalized processes.

### Service Transition:

The role of Service Transition is to put services/processes that are required by the Agency into operational use. Service Transition focuses on implementing all aspects of the services and processes and how they are used in ‘normal’ circumstances, as well as preparing for their use in foreseeable extreme or abnormal circumstances,

The main goals and objectives of Service Transition are to:

- Roll out the IT processes:
  - Capture Existing Process Documentation
  - Analyze Process Documentation
  - Validate Process Design
  - Develop Implementation Plan
  - Implement Organization and Technology Components

- Perform organizational change management:
  - Baseline Culture
  - Baseline Skills
  - Establish Training Development Structure
  - Design Organization
  - Implement Performance Management
  - Develop Transition Plan
  - Develop Training for Transition
  
- **Accountable** – ESM.
  - ESM has ultimate accountability for what Service Transition activities are appropriate for the Agency.
  
- **Responsible** – SIM
  - The SIM has responsibility for the data collection, analysis, and approaches necessary for introducing new services and processes into the Agency.
  
- **Consulted** – Agency and Center CIOs
  - The Agency and Center CIOs should be consulted with regard to service and process roll-outs (e.g., how the timing of those roll-outs might be staged; training for those services/processes).
  
- **Informed** –Mission CIOs, NASA Communications Office (PAO)
  - Although they have limited participation in the development of the service strategy, the Mission CIOs, and NASA Communications Office (PAO) must be informed with regard to the service definitions to ensure that services are utilized effectively across the agency.

**Enterprise Service Desk Oversight:**

The Enterprise Service Desk (ESD) plays a primary role in the execution of the Incident management, problem management, request fulfillment, and change management processes. In fact, the ESD is the first point-of-contact for all customer requests and/or IT performance issues

- Be the first-point-of-contact for all customer IT requests/issues across the Agency
  - Create and manage request/incident/change tickets across the Agency
  - Provide all Tier 0/1 support for the agency
- 
- **Accountable** – SIM Lead
  - The SIM Lead is accountable for ensuring that the ESD is equipped with the appropriate request, incident, problem, and change management process integration points necessary to enable cross-agency management.

- **Responsible** – Process Lead, Enterprise Service Desk
  - The Process Architect is responsible for the design of the ESD processes and cross-process integration points essential for enabling the ESD
  - The ESD is responsible for implementing the processes as defined by the SIM within its service desk/ticket management tool, as well as training for, adherence to, and performance measurement of those processes.
- **Consulted** – IT Providers
  - IT providers will be consulted regarding the ESD processes and integration points.

### Continuous Service Improvement:

Continuous Service Improvement seeks to review the current performance of the service organization and identify potential improvement efforts which will help increase overall performance. Continuous Service Improvement is applicable to: processes; services; contracts; performance reports; and organizational reporting structures

The main goals and objectives of Service Improvement are to:

- Assess existing processes; services; contracts; performance reports; and organizational reporting structures and identify potential opportunities for improvement
- Coordinate and conduct service improvement efforts
  
- **Accountable** – SIM Lead
  - The SIM Lead is accountable for ensuring that the continuous service improvement efforts are: appropriate, realistic, and conducted efficiently
- **Responsible** – Process Architect, Service Mgrs.
  - The process architect and the service managers will be responsible for conducting service and process improvement efforts.
- **Consulted** – All Others
  - Although the process architects and the service managers will play large roles in the refinement of services and processes, all others within the IT environment participate in providing their process/procedure/service documentation and performance information to ensure that improvement efforts remain applicable and can be absorbed within the Agency.

### Metrics/Performance Definitions and Evaluation:

Metrics/Performance Definitions and Evaluation (a subset of Continuous Service Improvement) works to aggregate performance information from across the agency and provide relevant and useful glimpses into the day-to-day quality of delivery.

The main goals and objectives of Service Design are to:

- Collect performance information from both internal and external service providers
- Aggregate and report performance (e.g., service, process, organizational) from across the IT environment.
- Establish appropriate process and service performance levels (i.e., service levels)
  
- **Accountable** – SIM Lead; Projects Executives, SE&I
  - The SIM Lead is accountable for ensuring that performance across the various service towers is appropriately aggregated and communicated.
  - The Project Executives will be accountable for collecting service level information
- **Responsible** – SIM Lead, Project Execs, Service Managers
  - The SIM Lead, Process Lead, and Project Execs will each have responsibility in the collection/aggregation/reporting of the service/process/organizational.

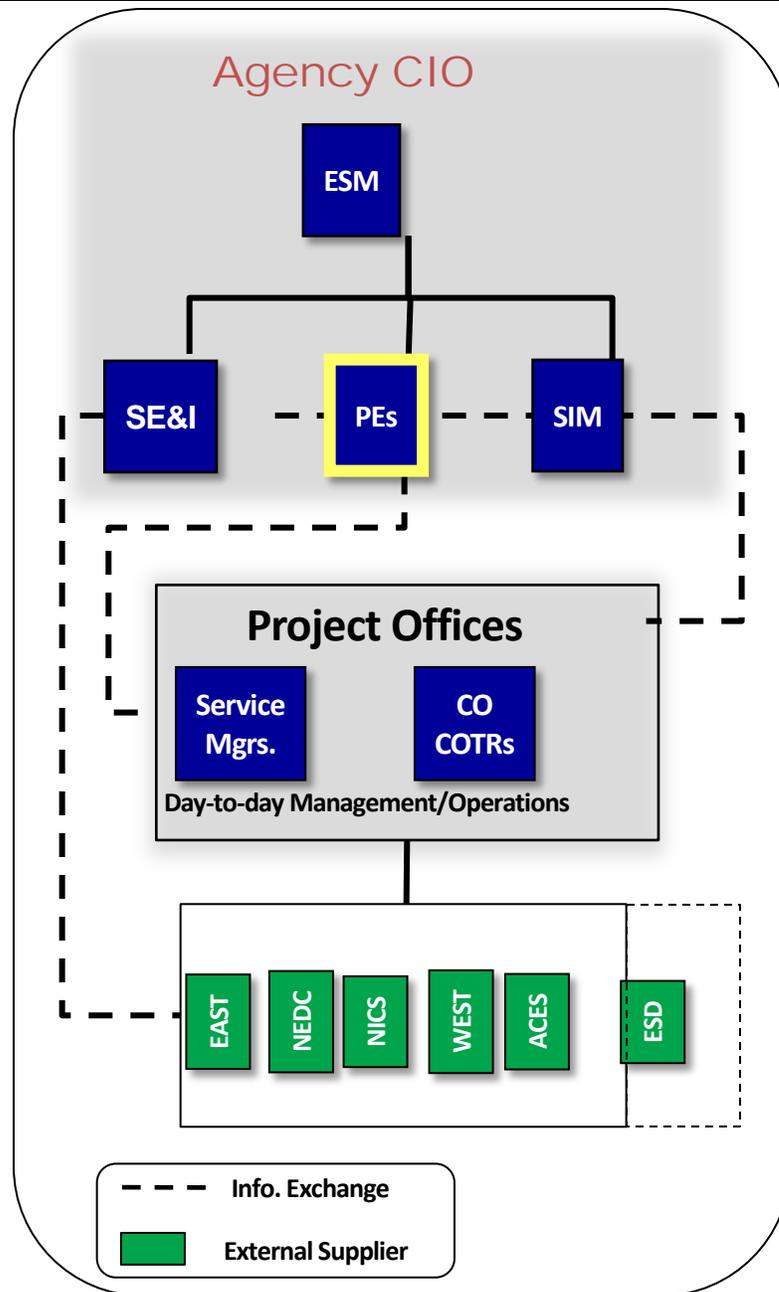
#### 5.4.4 PROJECT EXECUTIVES

As described earlier, the SIM will have responsibility for CSI, and Service Transitioning. The Project Executives on the other hand will work with Service Managers to manage and ensure the successful day-to-day operational delivery of those services. Although the Agency CIO holds primary accountability for ensuring that the day-to-day delivery of IT services are performed according to service level expectations, the PEs and the Project Offices (**See Figure 4**) associated with the service contracts hold primary responsibility for day-to-day supplier and contract management:

- Monitor the day-to-day operations of the various I3P service suppliers
- Monitor daily contract management responsibilities
- Accept and distribute performance reports coming from the I3P suppliers

#### Service Design:

As described earlier, Service Design provides the service details necessary to provide, acquire, and manage IT services for the OCIO customers. Whereas the SE&I has responsibility for the definitions of the services and their associated service levels across the agency from a Service Improvement perspective, the SE&I and PEs have responsibility for documenting the services and related service components (e.g., service architectures), supplier requirements, and how those suppliers are to work together to ensure service delivery coordination (e.g., cross-functional works statements) across multiple provider environments. Project Executives may be supported by their service managers in this effort.



**Figure 4 - Project Executives Organization**

**Service Operations:**

Once services have been made available to the NASA user community (e.g., I3P contract go-live), Service Operations seeks to deliver those services within agreed levels of service to users and customers, and to manage the applications, technology and infrastructure that support delivery of the services. It is important for Service Operations to:

- Monitor the day-to-day operations of the various I3P service suppliers

- Deliver and monitor IT services not supplied under the I3P contracts
- Perform daily contract management responsibilities
- Accept and distribute performance reports coming from the I3P suppliers
- Maintain a Business Relationship Management function

The I3P suppliers will be responsible for providing a significant portion of the IT services being delivered to NASA IT customers. As such, service managers will likely be responsible for monitoring the service providers to ensure they meeting their service level obligations and regularly tuning their services to best meet the needs of the NASA user community. It is recommended that the service managers be those individuals who are most knowledgeable of individual services, and may or may not have management authority. Individual Service Managers will support the Project Executives for which their service falls under.

Since centers will also have 'localized' IT service obligations (i.e., IT services and performance expectations not covered under the I3P contracts), Center CIOs/Deputy CIOs will continue their existing localized service responsibilities, and work with service managers to ensure a center perspective is maintained. This will enable the Center CIOs to preserve the overarching management of IT services being delivered within their centers, and facilitate the Business Relationship Management communications roles they will be adopting as well.

In addition to IT service delivery, the I3P initiative will require significant Contract Management support. Although not yet specified, COTRs will likely have the responsibility of ensuring that contract modifications, funding, etc., are handled in a timely and effective manner.

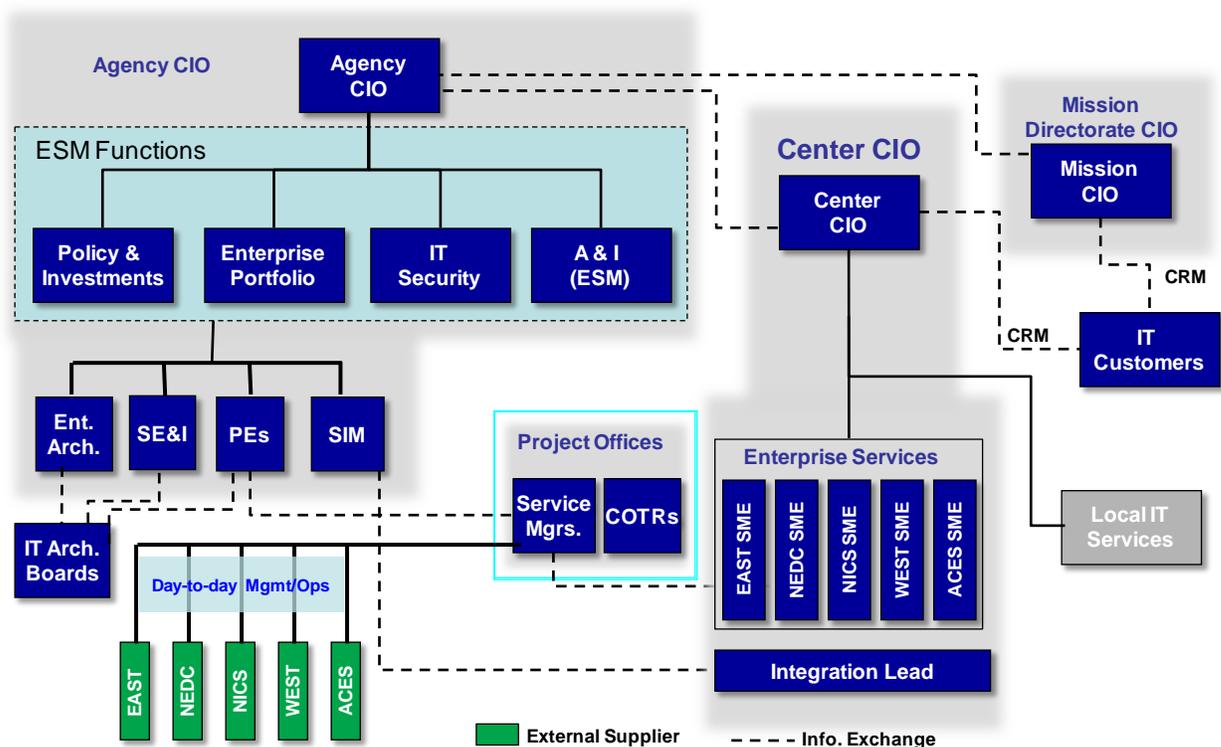
The establishment of a Project Office at each host center has been recognized as a possible vehicle for the coordination of the multitude of Service Managers and COTRs. These offices will enable NASA to gain consistency and repeatability for how Service Delivery/Performance and Contract Management are monitored across the Agency, and provide for easy information roll-up to the Center CIOs. In addition, the establishment of a Project Office will enable the Service Managers and COTRs to focus on their core areas of expertise and minimize the need for them to have project management skills.

- **Accountable** – Agency CIO
  - The Agency CIO holds primary accountability for ensuring that day-to-day delivery of Enterprise IT services are performed according to service level expectations.
- **Responsible** – Project Offices, Project Executives
  - The Project Offices associated with the service contracts hold primary responsibility for day-to-day supplier and associated contract management. In fact, the Project Offices may be the home of the Service Managers and COTRs, with moderate support from the Project Executives who may be asked to manage particularly high-impact contract or supplier management issues.

- IT Architectural Boards (composed of center SMEs, designated by CIOs/PEs/Service Managers) have responsibility for providing service evaluations and technical package preparation for service change requests.
- **Consulted** – SIM
  - Although the Project Offices will manage the suppliers and contracts on a daily basis, the SIM will likely perform a consultative role as it will have agency-wide information with regard to service levels.
- **Informed** –Mission CIOs, NASA Communications Office (PAO), Finance.
  - The Mission CIOs, NASA Communications Office (PAO), and Finance department will be informed of Service Operations to ensure effective communication of service delivery throughout the Agency.

The Deputy CIO’s at each Center may serve as site contacts. They would communicate with the ESM and more specifically the Service Operations Manager, keeping the ESM functional groups aware of ongoing operational issues, as shown in **Figure 5**. This role also supplies an on-site presence to shorten lines of communication and minimize misunderstanding.

On a rotating basis, a senior person among those responsible for performing ESM functions will serve as the Escalation Manager. This role will serve to focus resources on major critical Incidents (for example, a major outage.) The threshold required to trigger this escalation is defined in the Incident Management Process documentation.



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## Figure 5 – Agency CIO Organization

### 5.4.5 NOTE ON ORGANIZATION

Organizational charts, by their very nature, appear hierarchical. ESM, however, is actually a network of interrelationships and communications channels documented with the various ITIL processes, ESM Standard Operating Procedures, and the ESM Communications Plan.

### 5.5 ROLES AND RESPONSIBILITIES

This section contains descriptions of the key ESM roles necessary to support ITSM. These roles are defined to their core definition, sufficient to establish a concept and validate the ESM model by facilitating scenario use cases. The role information for ESM is presented in order of how the roles are displayed on the responsibility matrix found in Table 4. Each role description in the subsections below includes the focus, accountabilities, responsibilities and the decision rights for that role. Reporting definitions are included only when not defined by ITIL.

Roles are not positions nor are they job descriptions – they are abstractions which allow the definition and assignment of specific, related, activities to produce defined outcomes. An individual can fill more than one role or can change roles as needed to match day-to-day requirements. Role descriptions do combine to form organization positions and contribute to job descriptions. NASA must establish who is responsible for executing specific activities and who is accountable for what specific activity.

The graphical method to display this responsibility matrix is called the RACI table, as seen in Table 4, and the explanation of the letters of the acronym are as follows:

- R\* = Responsible for Oversight and Governance
- R = Responsible
- A =Accountable
- C = Consulted (before)
- I = Informed (after)

RACI charts are typically used to model detailed activities in a process design. To apply RACI modeling to the entire ESM organization, an “R\*” is used to indicate responsibility for oversight and governance. The “R\*” applies only to the CIO role, and the ESM Manager role and the SIM Manager role.

**Table 4 - ESM Responsibility Matrix**

Activities	ESM Roles by ITIL Lifecycle Phase																						
	General						Strategy			Design			Transition			Operations				CSI			
	Agency CIO	ESM Mgr	SIM Mgr	Process Owner (General)	Process Mgr. (General)	Customer*	Cust. Relationship Mgr.	Portfolio Manager	Financial Manger	SE&I	Service Owner	Service Catalog Mgr.	Transition Manager	Org. Change Mgmt. Mgr.	Knowledge Mgmt.Mgr.	Project Manager*	Service Manager	Escalation Manager	Site Contact	Supplier Mgr (COTR)	Service Supplier*	CSI Manager	Measurement & Report Manager
Overall Quality of IT Service	I	A	R	R		I	I		R	R	R	R	R	R	R	R	R		R	R	R	R	R
ESM Communications	C	A	R	R		I	I		R	R	R	R	R	R				I			R	R	
Oversight of SIM	C	I	R*	A																			
ITIL Process Oversight			R*	A																		R	R
<b>Service Strategy</b>	C	A	C	C		C	C	R	R	R	R			C	C								C
IT Strategy	C	A	I	I	I	C	C	R	R	R	I				I								
Customer Relationship Mgmt		R*				C	A		C	C	R	C	C		C			R					
Financial Management	R*	I	I	C				C	A	C	C		C			C			C				
Enterprise Portfolio Process	C	R*	I			C	C	A	C	R	I	C			I	R							
<b>Service Design</b>		CI	A			C	C	C	R	R	R	R	R			R	C				C	RC	R
Service Level Management		CI	R*			CI	CI		C	R	R	R										R	R
Service Catalog Process			R*			I	I	C		R	R	A											
<b>Service Transition</b>		CI	R*			I	I			R	R	I	A	R	R	R	R			I	R		R
Org Change Management		CI	R*										A		R								
ITIL Process Rollout		CI	R*	A	R								R	R		R				C	C		C
<b>Service Operations</b>		R*	C	R	R				C		R		R	R	R		A	R	R	C	R		R
Escalation Process	I	R*	CI			I	I		C		I		R		C		CI	A	C	C	RC	R	R
Supplier Management Process		R*	I						R		C		R			R	R	R	C	A	RC	C	C
<b>Continuous Service Improvement</b>		CI	R*	C	C				C		R		R	R	C		C				C	A	R
Service Measurement & Reporting	I	CI	R*		R	I	I				R	C	R		C		C				C	R	A

\*Role not described in this document.

## 5.5.1 ESM MANAGER

The ESM Manager's focus on the ESM is strategic.

### 5.5.1.1 Accountable for:

- Overall Quality of IT service delivered to NASA
- Overall ESM strategy
- Evaluating and Reporting ESM metrics
- Collaborating and aligning with Enterprise Portfolio efforts
- Oversight of:
  - SIM
  - Enterprise Architecture and Service Strategy
  - Service Operation
  - Project Executives
- Leading and owning the Overall ITSM Messaging and Awareness Campaign to achieve individual and stakeholder buy-in

### 5.5.1.2 Responsible for:

- Ongoing communication plan

### 5.5.1.3 Decision Rights

- Voting member of IT Management Board Approving Service Improvement Plans (SIPs)
- Member of Planning Change Advisory Board (CAB)

## 5.5.2 SIM MANAGER

The SIM Manager reports to the ESM Manager and focuses on the tactical day-to-day operation of the SIM.

### 5.5.2.1 Accountable for:

- Overall SIM strategy
- Oversight of:
  - Service Design lifecycle
  - Service Transition lifecycle
  - Continuous Process Improvement lifecycle
  - ITIL processes and other processes and procedures as assigned

### 5.5.2.2 Responsible for:

- Evaluating underpinning ITIL process efficiency and effectiveness based on process KPIs
- Assuring that underpinning ITIL processes are maturing and improving to maximum efficiency and effectiveness
- Roll-out of new processes and improved processes
- Roll-out of new IT services and improved IT services
- Reporting overall service performance metrics to the ESM and Center CIOs
- Deliver overall ITSM Communication and Awareness Campaign

### **5.5.2.3 Decision Rights**

- Cross Process Integration(s)
- Approving ITIL Process Improvement Plans
- Final Arbitrator of ITSM process disputes
- Member of Enterprise CAB

## **5.5.3 PROCESS OWNERSHIP (ITIL PROCESS OWNERSHIP)**

Successful Process Operations are critical to an organization's IT success. The SIM's focus on the process as it crosses organizational boundaries. The SIM process team reports to the SIM Manager.

### **5.5.3.1 Accountable for:**

- Owning the process and process documents
- Assuring that process continues to improve
- Leading process focused Messaging and Awareness Campaign
- Assuring that process is being followed and continues to penetrate organization
- Establishing Process Improvement Plans
- Driving Process Improvement Plans

### **5.5.3.2 Responsible for:**

- Championing, advocating, functioning as an ambassador, and protecting the process
- Processing specific messaging
- Leading all process specific steering teams

### **5.5.3.3 Decision Rights:**

- Approval of initial process design
- Approval of Process Roll-out Plan
- Approval of all proposed Changes to process
- Approval of all process documentation
- Approval of proposed process KPIs

## **5.5.4 PROCESS MANAGER (ITIL PROCESS MANAGER)**

The Process Manager focuses on the day-to-day operation of their specific process. The Process Manager reports to the Process Owner. This is the traditional description of an ITIL Process Manager.

### **5.5.4.1 Accountable for:**

- Hands-on, day-to-day operation of process

### **5.5.4.2 Responsible for:**

- Day-to-day operation of process
- Activities specified for specific process
- Supporting the specification of initial process KPIs and reporting ongoing process KPI results
- Supporting initial process design, plans and implementation
- Supporting Process Improvement Implementations

### 5.5.4.3 Decision Rights

- As defined for specific process

## 5.5.5 CUSTOMER RELATIONSHIP MANAGER

The focus of the CRM is to be the ears and voice of IT to the customer.

### 5.5.5.1 Accountable for:

- Representing IT to the customer
- Representing the customer to IT

### 5.5.5.2 Responsible for:

- Providing a focal point for high-level communications between line of business customers and the IT services organization
- Leading Service Reviews
- Managing the customer relationship with line of business customer executives:
  - Creating a Customer Relationship Plan establishing a relationship with a new customer or improving the relationship with a current customer (PEs)
  - Revising the Customer Relationship Plan with target customer executives and senior IT Management staff (CIOs, PEs)
  - Determining how formal or informal the relationship will be and assesses and documents the relationship over time
- Tracking Business Plans (PEs)
- Tracking Business Demand (PEs)
- Documenting patterns of business activity and user profiles (PEs)
- Advising line of business customers on IT services organization strategies and benefits (CIOs)
- Delivering proposals to Customer Executives (CIOs)
- Receiving purchase orders for IT services (PEs)

### 5.5.5.3 Decision Rights:

- Member of CAB for any Service Changes impacting specific Business

## 5.5.6 PORTFOLIO MANAGER

The Portfolio Manager focuses on the completeness and accuracy of the Service Portfolio throughout the service lifecycle.

### 5.5.6.1 Accountable for:

- Producing and maintaining the Service Portfolio

### 5.5.6.2 Responsible for:

- Ensuring that all pre-approved services in the pipeline will be recorded within the Service Portfolio
- Ensuring that all information within the Service Portfolio is accurate and up-to-date

- Ensuring that the information within the Service Catalog is adequately protected
- Coordinating with Service Owners and Customers to populate the Service Portfolio
- Ensuring that the Service Portfolio and all its collateral will be regularly reviewed and audited
- Providing input for Service Portfolio process improvement

#### **5.5.6.3 Decision Rights:**

- None specific

### **5.5.7 FINANCIAL MANAGER (NASA POLICY & INVESTMENT)**

The Financial Manager focuses on defining the costs associated with IT services across their service lifecycle.

#### **5.5.7.1 Accountable for:**

- Providing accurate costing information

#### **5.5.7.2 Responsible for:**

- Producing cost recovery plans and charging algorithms
- Establishing charging goals and policies
- Developing service budgets
- Leading the development of cost and charging allocation structures for the IT business (across all services)
- Leading the cost projection effort for new services
- Ensuring that projected revenues for new services will be analyzed and validated
- Supervising the collation of all costs associated with the provision of IT services
- Supervising the monitoring of IT service costs to ensure that business objectives (including the creation of profits from IT service provision, where appropriate) will be achieved
- Ensuring that total cost of ownership is tracked and reported
- Ensuring that financial assets will be managed appropriately
- Providing a service budget and design feedback so that appropriate standard service pricing can be established per service level
- Supplying service budget to provide cost guidelines for internal design specification
- Assessing the impact of Requests for Change (RFCs) on service cost and attends CAB meetings, when appropriate

#### **5.5.7.3 Decision Rights:**

- All Financial based approvals

### **5.5.8 SERVICE OWNER**

The IT Service Owner, which is mapped to the Project Executive, focuses on maximizing the quality of target services and meeting the needs of the business. The Service Owner reports to the ESM Manager and dotted line to the SLM Manager.

#### **5.5.8.1 Accountable for:**

- Entire lifecycle of specific IT service
- Quality of specific IT service delivered according to SLA
- Owning the IT service
- Represents the service across the organization

#### **5.5.8.2 Responsible for:**

- Working with the CRM and Service Level Manager to establish service success targets (SLAs, OLAs)
- Helping define the service inputs and outputs
- Providing input in CSI for SIP, working with the CSI Manager to identify and prioritize service improvement
- Reviewing analyzed data
- Being go-to contact for all service:
  - Issues
  - Service Improvements
  - Enhancements
  - Obsolesce
- Assuring sufficient service metrics are reported to both business and IT
- Assuring that all service issues are documented, tracked and resolved
- Representing the service in CAB meetings in the case of Service Improvement related Changes

#### **5.5.8.3 Decision Rights:**

- Member of CAB for all Changes to owned service

### **5.5.9 SERVICE CATALOG MANAGER**

The Service Catalog Manager focuses on the completeness and accuracy of the Service Catalog from service approval to service retirement in the service lifecycle.

#### **5.5.9.1 Accountable for:**

- Producing and maintaining the Service Catalog (EA)

#### **5.5.9.2 Responsible for:**

- Ensuring that all operational services and all services being prepared for operational use are recorded within the Service Catalog (SIM)
- Ensuring that all information within the Service Catalog is accurate and up-to-date (SIM)
- Ensuring that all information within the Service Catalog is consistent with the information within the Service Portfolio (SIM)
- Coordinating with the Service Catalog Manager to populate the Service Catalog (SIM)
- Ensuring that the information within the Service Catalog is adequately protected (SIM)
- Ensuring that the Service Catalog and all its collateral are regularly reviewed and audited (SIM)
- Providing input for Service Catalog Management process improvement (SIM)

### **5.5.9.3 Decision Rights:**

- None specific

## **5.5.10 TRANSITION MANAGER**

The Transition Manager focuses on ensuring that Transition processes function smoothly, maximizing value to and minimizing impact on the customer.

### **5.5.10.1 Accountable for:**

- Facilitating Service Transition activities

### **5.5.10.2 Responsible for:**

- Overseeing Service Transaction activities

### **5.5.10.3 Decision Rights:**

- Sign-off of all Transition Plans
- Member of Enterprise CAB

## **5.5.11 ORGANIZATIONAL CHANGE MANAGEMENT MANAGER**

The Organizational Change Manager focuses on culture change and minimizing impact by facilitating acceptance of major Organizational Change.

### **5.5.11.1 Accountable for:**

- None specific

### **5.5.11.2 Responsible for:**

- Providing Organizational Change Management expertise
- Overall Communication Plan
- Establishing the overall Change message.
- Facilitating over-communicating the message
- Assuring top management maintains and demonstrates support
- Gathering and maintaining support for the Change

### **5.5.11.3 Decision Rights:**

- None specific

## **5.5.12 KNOWLEDGE MANAGER**

The Knowledge Manager focuses on the IT Knowledge Lifecycle to maximize knowledge's benefit the Business.

### **5.5.12.1 Accountable for:**

- The quality of knowledge managed by the Knowledge Management process
- The operational aspects of the Knowledge Management process
- Owns the Service Knowledge Management System (SKMS)

#### **5.5.12.2 Responsible for:**

- Chairing the Knowledge Management Council
- Advising to content and identifies knowledge gaps
- Identifying sources of content
- Acting on articles that are flagged
- Managing consumer's feedback
- Providing ongoing feedback to consumers and management regarding quality and skills competencies
- Passing communication relative to knowledge
- Providing input for process improvement

#### **5.5.12.3 Decision Rights:**

- Signs off on SKMS Plan, design and updates

### **5.5.13 SERVICE MANAGER**

The Service Manager focuses on ensuring that the IT Service Management function is executed monthly, maximizing value to, and minimizing impact on, the Customer. To achieve this, the role **focuses on the specific ITIL processes running through and across the IT Operations Management** function.

#### **5.5.13.1 Accountable for:**

- Facilitating Service Operation activities by facilitating ESM communication

#### **5.5.13.2 Responsible for:**

- Overseeing of the Service Supplier activities
- Maintaining contact and communication with the IT Service Management function and corresponding Service Suppliers

#### **5.5.13.3 Decision Rights:**

- Member of CAB

### **5.5.14 ESCALATION MANAGER**

The Escalation Manager focuses on resolving critical incidents, as defined in the Incident Management Process, quickly and efficiently. The Escalation Manager reports to the ESM Manager and to the Incident Manager.

#### **5.5.14.1 Accountable for:**

- Activities and resources required to resolve escalated Incidents

#### **5.5.14.2 Responsible for:**

- Performing escalation evaluations
- Understanding the business impact of the escalated Incident or Service Call
- Managing the vertical escalation process

- Owning Escalation Communication Plan to ensure all communications regarding escalations are planned and orderly
- Coordinating the creation of escalation teams
- Conducting checkpoint escalation status review meetings
- Conducting a Post Escalation Review
- Closing escalation after customer approval

#### **5.5.14.3 Decision Rights:**

- Temporally allocate staff to escalation efforts from current efforts
- Sign-off of post-escalation review

### **5.5.15 SITE CONTACT (NASA CENTER DEPUTY CIO)**

The Site Contact focuses on maintaining ESM communication.

#### **5.5.15.1 Accountable for:**

- Shortening and enhancing local to ESM communication lines

#### **5.5.15.2 Responsible for:**

- Providing a local contact to facilitate ESM communications (CIO)
- Providing local validation (CIO)
- Providing local facilitation during escalations (Service Manager)

#### **5.5.15.3 Decision Rights:**

None specific

### **5.5.16 SUPPLIER MANAGER (NASA COTR)**

The Supplier Manager focuses on the relationship with Service Suppliers to maximize the benefit to the Business. They ensure that the requirements outlined in the SOWs are fulfilled and that the tax payer's funds are well spent.

#### **5.5.16.1 Accountable for:**

- Relationships with Service Supplier(s)

#### **5.5.16.2 Responsible for:**

- Ensuring that any Contracts, SOWs, Agreements or SLAs developed are aligned with those of the business
- Ensuring that all supporting services are scoped and documented and that interfaces and dependencies between Suppliers, supporting services and Supplier processes are agreed and documented
- Reviewing and performing Risk Analysis of all Suppliers and Contracts on a regular basis
- Ensuring that all roles and relationships between lead and any sub-contracted suppliers are documented, maintained and subject to contractual agreement
- Providing assistance in the development and review of SLAs, Contracts, SOWs, or any other documents for Third-Party Suppliers

- Ensuring that value for money is obtained from all IT Suppliers and Contracts
- Ensuring that all IT Supplier processes are consistent and interfaces to all corporate supplier strategies, processes and standard terms and conditions
- Maintaining and reviews a Supplier and Contracts Database

#### **5.5.16.3 Decision Rights:**

- As defined in the Supplier Management Process, and government policy and procedures documentation

### **5.5.17 CSI MANAGEMENT**

The CSI Manager focuses on continuously improving both IT services and ITIL processes to benefit the business.

#### **5.5.17.1 Accountable for:**

- The success of all improvement activities
- All improvement programs

#### **5.5.17.2 Responsible for:**

- Developing the CSI domain
- Working with the Service Owner and ITIL Process Owners to identify and prioritize improvement opportunities
- Working with the Service Level Manager to identify SIP
- Identifying other frameworks, models and standards that will support CSI activities
- Ensuring that Knowledge Management is an integral part of the day-to-day operations
- Ensuring that CSI activities are coordinated throughout the service lifecycle
- Reviewing analyzed data
- Presenting recommendations to senior management for improvement
- Helping prioritize improvement opportunities
- Leading, managing and delivering cross-functional and cross-divisional improvement projects
- Building effective relationships with the business and IT senior managers
- Identifying and delivering process improvements in critical business areas across manufacturing and relevant divisions
- Coaching, mentoring and supporting fellow service improvement professionals

#### **5.5.17.3 Decision Rights:**

- Sign-off of all Improvement Plans and Programs

### **5.5.18 MEASUREMENT AND REPORTING**

The Service Measurement and Reporting Manager focuses on acquiring data and extracting and reporting information to the ESM to support decision making and quality service deliver to the Business.

#### **5.5.18.1 Accountable for:**

- The success of all measurement and reporting activities

#### **5.5.18.2 Responsible for:**

- Ensuring that Service Measurement and Reporting activities are coordinated throughout the service lifecycle
- Defining measures and set targets based on the requirements
- Collaborating with all other stakeholders to review and approve the Service Measurement Framework
- Assessing measurement and reporting frameworks
- Influencing all levels of management to ensure that measurement activities are receiving the necessary support and are resourced sufficiently to implement solutions

#### **5.5.18.3 Decision Rights:**

- None specific

### **5.5.19 SERVICE MEASUREMENT AND ANALYSIS**

The Service Measurement and Reporting Analyst role focuses on selecting and acquiring data from the infrastructure and marshaling that data to a reporting tool. This role will be one of several roles performed by one person.

#### **5.5.19.1 Accountable for:**

- None specific

#### **5.5.19.2 Responsible for:**

- Designing measurement (instrumentation) and reporting frameworks
- Ensuring the validity of the data gathered
- Consulting with Service Owners, application owners and process owners to establish measurable metrics
- Reviewing and selecting data from services, applications, systems, sub-systems and components in order to obtain an end-to-end service achievement
- Reviewing and selecting process data
- Providing data to the Service Measurement and Reporting Administrator

#### **5.5.19.3 Decision Rights:**

- None specific

### **5.5.20 SERVICE MEASUREMENT AND REPORTING**

The Service Measurement and Reporting Administrator role focuses on defining and producing required reports and managing the underpinning reporting tool(s). This role will be one of several roles performed by one person.

**5.5.20.1      Accountable for:**

- None specific

**5.5.20.2      Responsible for:**

- Consolidating data from multiple sources
- Translating data into packaged and meaningful information
- Producing reports to support SLM, CSI, process improvement and others that the ESM may require
- Managing the underpinning tool(s)
- Analyzing trend data and identifies underlying Problems and potential improvements.
- Supporting CSI with specialist problem solving and analytical skills and knowledge of technical and business domains
- Developing workarounds, Requests for Change, and preventative actions for Problems
- Ensuring rapid root cause analysis of Problems
- Serving as a analytical resource for ESM

**5.5.21.3      Decision Rights:**

- None specific

## 5.6 ITIL PROCESS ARCHITECTURE

The ITIL process architecture is broken down into the five ITIL “books” that represent the ITIL process lifecycle phases which can be seen in Figure 6 below. The lifecycle begins with Service Strategy and ends with Continual Service Improvement which initiates the next Service Strategy iteration. The figure below graphically portrays what processes are associated with each lifecycle phase. In addition, Table 5 provides the detail for the location of the Process Manager for each of the processes within each of the lifecycle phases.

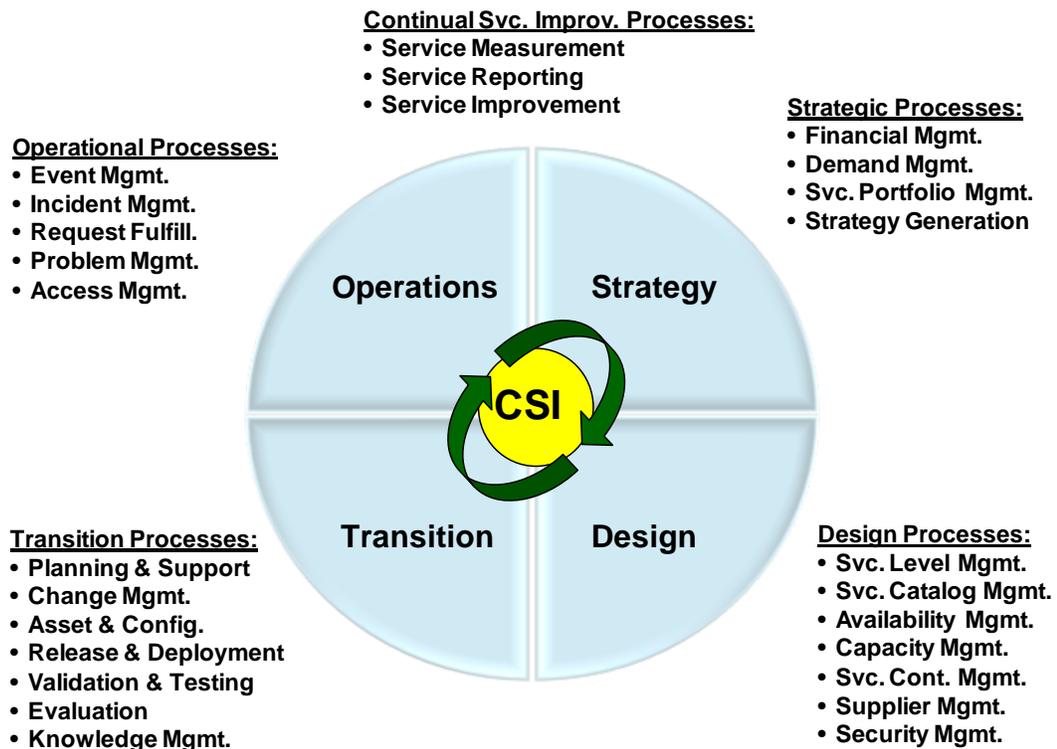


Figure 6 – ITIL Process Architecture

**Table 5 - ITIL Process Location, by Lifecycle Phase**

Lifecycle Phase	Process	Location of Process Mgr
Strategy	Demand Management	EA
	IT Financial Management	Policy and Investments
	Service Portfolio Management	EA
	Strategy Generation	EA
Design	Availability Management	SE&I
	Capacity Management	SE&I
	Information Security Management	IT Security Division
	Service Continuity Management	Center local IT Services
	Service Catalog Management	EA
	Service Level Management	SIM
	Supplier Management	Project Offices, EA
Transition	Change Management	Center local IT Services
	Knowledge Management	SE&I/EA
	Release and Deployment Management	Center local IT Services
	Service Asset and Configuration Management	Center local IT Services
	Evaluation	SIM
	Service Validation and Testing	Center local IT Services
	Transition Planning and Support	Center local IT Services
Operations	Event Management	Center local IT Services
	Incident Management	Center local IT Services
	Problem Management	Center local IT Services
	Request Fulfillment	Center local IT Services
	Access Management	Security Operations Center
CSI	Service Improvement	SIM
	Service Measurement	SIM
	Service Reporting	SIM

Each process is independent of where the process manager resides, and all processes are enterprise wide. The key to the success of ESM is data and information flow. All service and process reporting will be funneled through CSI in the SIM.

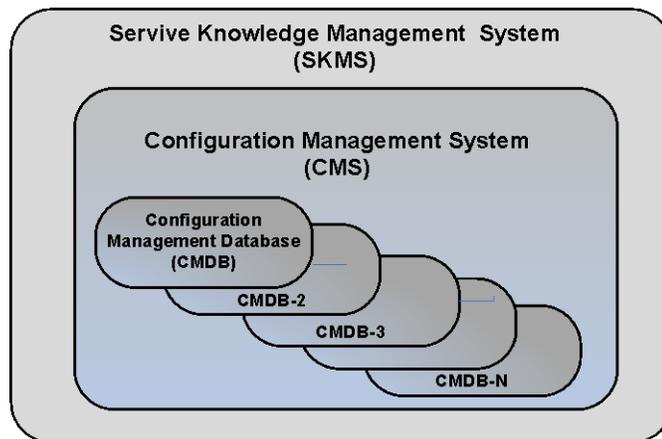
## 5.7 GOVERNANCE

NASA's choice of the ITIL best practice framework helps support IT Governance which is a term used throughout IT organizations to differentiate governance from management. Management is making decisions and executing processes. Governance is making strategic decisions and is the management-of-management by the establishment of frameworks of decision rights which encourage desired behavior.

## 5.8 ENTERPRISE SERVICE MANAGEMENT TOOL BEST PRACTICE

To be successful, ESM will depend on the ITIL processes and the tooling that supports those processes. ESM will also require reporting tools to monitor how services and the infrastructure are performing and will need work flow tooling to support communications.

A key best practice principle for selecting the proper tools is to maximize the use of commercial off-the-shelf (COTS) products. ITIL's tool architectural best practice can be described in three layers. At the lowest layer are data sources such as Configuration Management Databases (CMDBs). The middle layer contains a Configuration Management System (CMS) which binds the various data sources into a cohesive information source. Overlaying everything is the Service Knowledge Management System (SKMS) to manage and present useful knowledge. A graphical depiction of the three layer model can be seen in Figure 7.



**Figure 7 - ITIL Tool Three Layer Model**

ITIL best practice infers that everything is in the SKMS, as illustrated in Figure 6. ITIL is not implying that the knowledge management system is a single physical tool but rather a logical integration of knowledge tools, each fitting into the three layer model.

## 5.9 ESM MEASUREMENTS

As a best practice, any organization needs to have KPIs to measure its progress, quantify IT's success and identify areas for improvement. Each ITIL process will have metrics to measure its efficiency and effectiveness. Like any service or process, ESM functions will be able to measure the overall efficiency and effectiveness of its operations.

Since the people responsible for ESM are tasked with the oversight of the enterprise delivery of IT services, these metrics will be rolled up to a summary level. These metrics will be used to establish a baseline and periodically track progress. Further, these metrics will provide a basis for benchmarking NASA IT to other IT organizations implementing ITIL.

In collaboration with management, the ITIL Service Measurement and Service Reporting Processes will drive the establishment of specific metrics and targets and the tools necessary to capture and report them. The Measurement and Reporting Manager, Analysts and Administrator are involved in capturing the data and conducting the analysis required to drive these decisions.

Listed below are recommended best practice ESM KPIs that are focused in the areas of effectiveness and efficiency.

### 5.9.1 EFFECTIVENESS

- **Maturity Level** – Using a measurement technique similar to the one used by the Industry for in-production processes where 1 = lowest maturity and 5 = highest maturity, ESM can use an agreed to target and plot the process maturity on a spider graph for a visual review. An example of this can be seen in Figure 8 below.

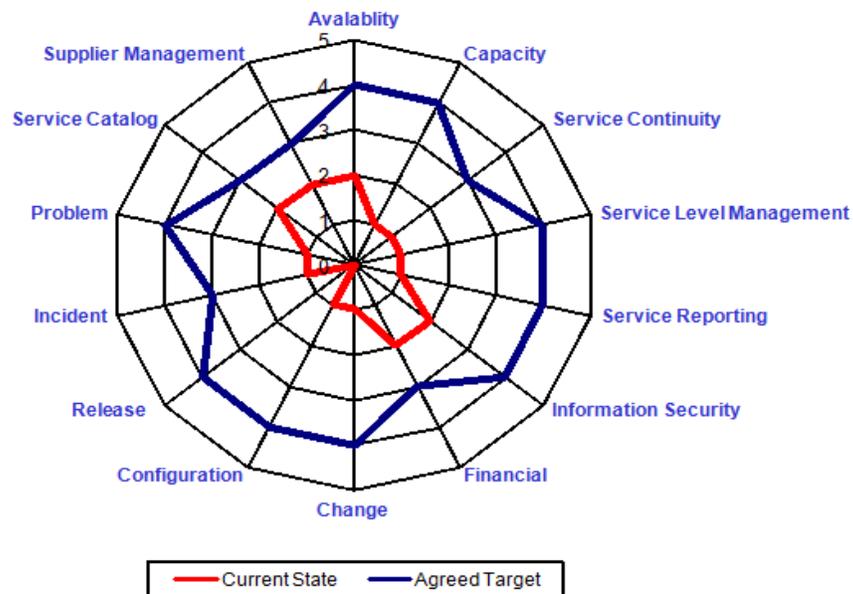


Figure 8 – Sample Process Maturity Spider Diagram

- **Schedule Status** – The status of ITIL processes being launched. Once all ITIL processes have been launched, this metric ceases to have validity.
- **ISO 20000 Comparison** – Using the requirements in ISO 20000-1 (International Standard for ITSM), perform an audit against the current state of ITSM enterprise wide. Calculate the percentage of items in ISO 20000-1 which are acceptable. A yearly review will highlight successes, as well as gaps.
- **Breaches** – The number of SLA breaches per month divided by the number of services. This will provide a view of the effectiveness of service improvement and the overall proactive aspects of the ITIL processes.
- **Enterprise Service Desk Calls** – The number of Service Desk calls, divided by the number of services. This is not a definitive measure, but will give an indication of the success of service improvement. However, it will be affected by Problem Management and other ITIL processes. This metric will be tracked by service as well.
- **Total Number of Users** – The total number of users supported by IT is a high level indication of the effort IT is achieving and is a valuable metric to trend.
- **Total Number of IT Services** – The total number of IT services supplied by IT is a high level indication of the effort IT is achieving and is a valuable metric to trend.

## 5.9.2 EFFICIENCY

- **Cost** – Historically, one of the main benefits of utilizing ITIL best practices is cost reduction. Overall cost reductions may not be easily seen since the organization grows and changes over time. In addition, it is possible that the IT budget does not actually decrease because IT is accomplishing more for every dollar spent. For these reasons, ratios provide a better indication of efficiencies. A good trend measurement will be a reduction in cost per user or service. A downward trend will be an indication that the budget is sufficient, that errors are being removed from the system and that the IT staff understand their roles while maintaining or increasing the quality of service delivery.

The two metrics shown below can be used to indicate the cost reduction efficiencies achieved by the use of ITIL best practices.

$$\text{Cost Per User} = \frac{\text{Total Monthly Cost of IT Services}}{\text{Number of Users}}$$

$$\text{Cost Per Service} = \frac{\text{Total Monthly Cost of IT Services}}{\text{Number of Services}}$$

- **IT Staff Ratios** – ITIL makes IT more efficient over time. This will lead to increased IT staff efficiencies as new services continue to roll out. An upward trend will show that better IT services will be delivered with less IT staff, indicating that errors are being removed, processes are working smoothly and the IT staff understand their roles.

The two metrics shown below can be used to capture the staff efficiency generated by the use of ITIL best practices:

$$\text{Users Per Staff} = \frac{\text{Number of Users}}{\text{IT Staff Count}}$$

$$\text{Services Per Staff} = \frac{\text{Number of Services}}{\text{IT Staff Count}}$$

## 6. OPERATIONAL FRAMEWORK

The following section describes how ESM fits within the NASA structure and how it links to NASA's organizational groups.

### 6.1 POSITION WITHIN NASA

ESM will be part of the OCIO organization, reporting directly to the NASA CIO. Figure 9 provides a pictorial view of the organizational structure.

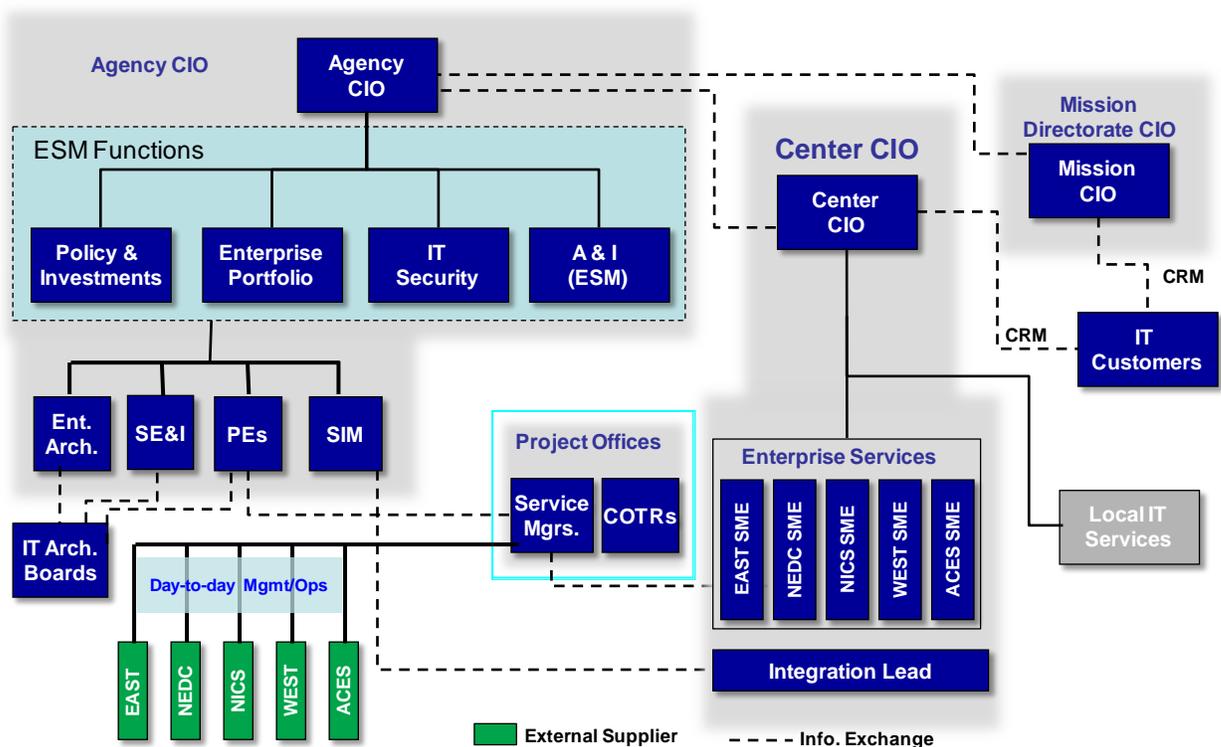


Figure 9 - ESM as part of the OCIO Organization

### 6.2 INTERRELATIONSHIP OF SERVICE SUPPLIERS AND THE ENTERPRISE SERVICE MANAGEMENT FUNCTIONS

Service Suppliers and ESM will communicate via two paths. Official and contractual matters will be through the Supplier Management Process and the COTRs who staff that process. There is a specified ITIL process for Supplier Management that is a subset of standard government policies and procedures. The official line of communication will follow the standard government policies and procedures.

The more important day-to-day communication, upon which the success of service delivery depends, is the operational communication and data flow from the various Service Suppliers through the Service Managers in the Project Offices to the Pes and the SIM, and ultimately related to ESM. Much of this information and data will enter via the CSI team and the analysts within the ITIL Service Reporting and Service Measurement Processes.

The Service Suppliers are hired for their expertise. How they achieve IT service results is not the concern of NASA, except where defined in the individual supplier’s SOW. What NASA IT is concerned with is the flow of information and measurements from the Service Supplier to provide evidence of service improvement, risk mitigation and service levels. Even if an IT service is wholly controlled and operated within the domain of a contract, the service level metrics, and KPIs still need to be communicated in relation to ESM.

### 6.3 COMMUNICATIONS

ESM requires a widely distributed Communications Plan to regulate and control its interface with other IT organizations, processes, and functions. Reports of service metrics, process metrics and KPIs are critical for the ESM to make decisions and demonstrate credibility. All user communication with NASA IT will be initiated through the Enterprise Service Desk. Customers will also be able to communicate with the ESM via the CRM at each Center.

As a best practice, the SIM provides targeted reports to executives or individuals. Reporting is focused on information, not data. At the same time, the reports and corresponding data need to be widely available. A best practice is to automate much of the reporting and deploy it on some form of readily accessible form, such as a web page. This information is a component of the Organizational Change Management’s effort to facilitate wide spread buy-in to, and support of, ITSM.

Because ESM and the ITIL processes are very interrelated, much of the internal and external data flow will be defined in the individual process design documentation that is beyond the scope of this document. Tables 6, 7 and 8 below outline the high level inputs and outputs of ESM.

**Table 6 - ESM Reports**

From	To	Document	Frequency
Reporting and Measurement	CIO, ESM Manager , SIM Manager and All	ESM Metrics	Monthly
Reporting and Measurement	CIO, ESM Manager, SIM Manager, Service Owners, Customers and All	SLA Metrics	Monthly
Reporting and Measurement	CIO, ESM Manager , SIM Manager, Service Owners, SLM , COTRs, Service Suppliers	OLA Metrics	Monthly

From	To	Document	Frequency
Reporting and Measurement	SIM Manager, Process Owners, Process Managers, and All	Process Metrics and KPIs	Monthly
Reporting and Measurement	ESM Manager, SIM Manager, Service Owners, Incident Manager, Problem Manager, COTRs and All	Daily Report of process based metrics, for example: Number of SLA breaches, Number of Escalations, and Number of Incidents by category	Daily
Reporting and Measurement	ESM Requester	Formatted Service and Process Metrics	Submitted Request (ad-hoc)

**Table 7 - Process and IT Service Data**

From	To	Document	Frequency
Process Managers (Underpinning process instrumentation)	Reporting and Measurement	Raw Process Metrics and KPIs	As defined in process documentation
Service Suppliers	Reporting and Measurement	Raw IT Service Metrics	As defined in contract and as required by specific IT service
Service Suppliers	Reporting and Measurement	Raw Process Metrics	As defined in contract and as required by specific IT processes

**Table 8 - Process Communications**

<b>From</b>	<b>To</b>	<b>Document</b>	<b>Frequency</b>
Incident Management (Service Desk)	Escalation Manager	Notification of Escalation	As required
Escalation Manager	ESM Management, SLM Management, Service Owner, Incident Management and Problem Management	Post Escalation Review document	Compellation of an Escalation
Customer Relationship Management (CRM)	Planning CAB (Service Strategy)	Request for a new service	As required
Planning CAB (Service Strategy)	CRM, Planning CAB	Status of: Define, Analyze, Approve, Charter Activity	As required
Planning CAB (Service Strategy)	Financial Manager	Request for Cost Benefit Analysis on proposed service Change	As Required
Financial Manager	Planning CAB (Service Strategy)	Request for Cost Benefit Analysis on proposed service Change	As required
CAB	SIM (Service Transition)	Request for Evaluation	As required
SIM (Service Transition)	Service Strategy	Request for Evaluation	As required
SIM (Service Design)	Customer, CRMs and All	Service Catalog	Updated on a regular bases and when Major Change occurs.
Analyst	Problem Manager	Problem and Incident Ticket.	As discovery of a Problem via data mining

From	To	Document	Frequency
Organizational Change Management	NASA IT, All	Power Point show supporting Major Change and benefits of a new Change	As required
Organizational Change Management	NASA IT Management	1 day ITSM overview	As required

## 6.4 TRAINING AND AWARENESS CAMPAIGNS

An awareness campaign and supporting training will be needed for the initial SIM rollout and also for major changes and the rollout of each ITIL process. The SIM will initiate and coordinate this ITIL training by both formal and informal methods and awareness campaigns. ITSM is a definite cultural change and requires a significant effort to build the consensus that behavioral change is necessary. Mandates for change from upper management, while very necessary, are not sufficient. Making all levels aware of all elements within the communication plan and the benefits of adoption are critical to the success of moving to an ITIL operational environment.

The introduction of new or major changes in services will need the same effort applied. Personnel need to know the need, and the benefits, of a new or changed service, which will lead to acceptance.

While awareness is especially important during implementation, it is an ongoing need. New personnel may not be familiar with ITSM, and current personnel, especially when moving into a new position, may need refresher training to ensure the ESMoth operation of the various processes.

### 6.4.1 SUGGESTIONS FOR A NASA AWARENESS CAMPAIGN

- Given the current economic environment, now is not a time to be perceived as being expensive, inefficient or ineffective
- ESM is chartered to be the focus for delivering the NASA-wide I3P effort
- While IT itself is not a NASA core competence, delivering and continuously improving IT services is
- NASA is targeting the reduction in IT cost and reallocating corresponding funds to innovation and NASA missions
- NASA is not targeting a head-count reduction
- NASA's strategy is to leverage the scalability of running IT as a coherent whole and not as individual IT centers and to do this, NASA will need to exploit proven Industry best practices
- NASA will need to consolidate the various IT distributed Knowledge Bases, making it easier for users to access IT services, thereby freeing up expert talent for innovation
- It is too expensive to maintain, improve and mature proprietary processes
- NASA will be creating many new, critical and challenging roles to transform and operate the to-be environments

## 6.4.2 ORGANIZATIONAL CHANGE MANAGEMENT

Based on industry best practices, NASA IT will use a publically available and well understood model. A noted authority on organizational change management, referenced by ITIL, outlined eight steps to transform an organization:

- Step 1 – Increase Urgency
- Step 2 – Build the Guiding Team
- Step 3 – Get the Vision Right
- Step 4 – Communicate the Buy-In
- Step 5 – Empower Action
- Step 6 – Create Short Term Wins
- Step 7 – Don't Let Up
- Step 8 – Make Change Stick

## 6.4.3 TRAINING

The launching of ESM and the ongoing operation of ESM requires training. The following are highly recommended:

- ITIL Foundations – for those having roles in ESM
- Introduction to ESM – for the NASA community to answer the questions of Why, What and How

As part of the roll out plan for each ITIL process the following training is recommended:

- ITIL Practitioner training for those having roles in the process
- Custom user training for those with roles in the process
- Custom process training for those with roles in the process, those with roles that touch the process and ESM staff

ITIL certified training courses offer training to facilitate the adoption of ITIL. These are taught through various training organizations and a listing of the current, standard offerings are shown in Table 9 - ITIL Standard Training Courses.

**Table 9 - ITIL Standard Training Courses**

Course	
Foundations	ITIL Foundations
Clustered Practitioner Courses	ITIL Practitioner Support and Restore
	ITIL Practitioner Release and Control
	ITIL Practitioner Agree and Define
	ITIL Practitioner Plan and Improve
Capability Courses	Service Offerings and Agreements
	Operational Support and Analysis
	Release, Control and Validation
	Planning, Protection and Optimization
Life cycle Courses	Service Strategy
	Service Design
	Service Transition
	Service Operation
	Continual Service Strategy

For those who hold ITIL certifications under version 2, there are bridge courses available to update the certifications to ITIL version 3.

## 7. ESM – STAFFING RECOMMENDATION

The roles identified in Section 5.5 are summarized here for the ESM functions. The tables in this Section provide the role, position, type [FTE or WYE] and skills required. In addition, each role is defined as “New” or “Existing [e.g. currently filled]” and for the new positions, the recommendation of FTE level is also identified. Finally, Table 10 below provides a summary of the new positions being recommended to successfully support ESM.

**Table 10 – Additional Staffing Recommendation Summary - by ITIL Lifecycle Phase**

	New Level	General	Strategy	Design	Transition	Ops	CSI	Total
	GS-11/13 or WYE	3			3*	1**	1	8
	GS-9/11 or WYE						1	1
	GS-7/9 or WYE						2	2
<b>Total</b>		<b>3</b>	<b>0</b>	<b>0</b>	<b>3*</b>	<b>1**</b>	<b>4</b>	<b>11</b>

\* These positions are preferred, but optional

\*\* Will be a 1-to-many relationship (multiple services per person)

**Table 11 – Enterprise Service Management Staffing Recommendations**

Lifecycle Phase	Role/ Function	Position	Type	Skills Required	New or Existing	New Level
General	ESM Management	ESM Manager	FTE	<ul style="list-style-type: none"> <li>ITIL Foundations (optional)</li> </ul>	Existing FTE	
General	SIM Management	SIM Manager	FTE	<ul style="list-style-type: none"> <li>ITIL Practitioner/Expert</li> <li>Leadership skills</li> <li>Business skills</li> <li>Management skills</li> <li>Communication skills</li> <li>Process skills</li> </ul>	Existing FTE	
General	Process Ownership	SIM	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Foundations</li> <li>Management skills</li> <li>Communications skills</li> <li>Process skills</li> </ul>	New	GS-11/13 or WYE
General	Process Management	Integration SME	FTE	<ul style="list-style-type: none"> <li>Contract SME at each Center hosting a contract</li> <li>Process performance for contracts at the Center</li> </ul>	Existing FTE	
Strategy	Customer Relationship Mgmt.	Center CIOs	FTE	<ul style="list-style-type: none"> <li>ITIL Foundations (recommended)</li> <li>Business skills</li> <li>Management skills</li> <li>Communication skills</li> </ul>	Existing FTE	
Strategy	Portfolio Management	Enterprise Architecture	FTE	<ul style="list-style-type: none"> <li>ITIL Foundations</li> <li>Data skills</li> <li>Reporting skills</li> <li>Business skills</li> </ul>	Existing FTE	
Strategy	Financial Management	Policy and Investment	FTE	<ul style="list-style-type: none"> <li>ITIL Foundations</li> </ul>	Existing FTE	

Lifecycle Phase	Role/ Function	Position	Type	Skills Required	New or Existing	New Level
Design	Service Owners	Service Owner (PE)	FTE	<ul style="list-style-type: none"> <li>ITIL Foundations</li> <li>Business skills</li> <li>Management skills</li> </ul>	Existing FTE	
Design	Service Catalog Manager	Service Catalog Lead	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL or SLM Practitioner</li> <li>Business skills</li> <li>Management skills</li> </ul>	Existing WYE	
Design	Enterprise Architecture Manager	Enterprise Architecture Manager	FTE	<ul style="list-style-type: none"> <li>ITIL Foundations (optional)</li> <li>Business skills</li> <li>Management skills</li> <li>Technical background</li> </ul>	Existing FTE	
Transition	Transition Managers	Service Transition Lead	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Practitioner Service Transition</li> <li>Business skills</li> <li>Management skills</li> </ul>	New *	GS-11/13 or WYE
Transition	Organizational Change Management Mgr	Organizational Change Mgt Mgr	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Foundations</li> <li>Organizational skills</li> <li>Leadership skills</li> </ul>	New *	GS-11/13 or WYE
Transition	Knowledge Management Mgr	Knowledge Manager	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Practitioner Service Transition</li> <li>Management skills</li> <li>Technical skills</li> </ul>	New *	GS-11/13 or WYE
Operations	Service Manager	Service Manager	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Practitioner</li> <li>Management skills</li> <li>Technical background</li> <li>Will be a 1-to-many relationship (multiple services/person)</li> </ul>	New	GS-11/13 or WYE
Operations	Escalation Manager	Escalation Lead/ ESD Lead	FTE	<ul style="list-style-type: none"> <li>Management skills</li> <li>Technical background</li> </ul>	Existing FTE	
Operations	Site Contact	Center Deputy CIO	FTE	<ul style="list-style-type: none"> <li>ITIL Foundations (recommended)</li> <li>Management skills</li> </ul>	Existing FTE	

Lifecycle Phase	Role/ Function	Position	Type	Skills Required	New or Existing	New Level
Operations	Supplier Manager	COTR	FTE	<ul style="list-style-type: none"> <li>ITIL Foundations (recommended)</li> </ul>	Existing FTE	
CSI	Continuous Service Improvement Mgr	SIM	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Practitioner CSI</li> <li>Leadership skills</li> <li>Management skills</li> <li>Communication skills</li> <li>Process skills</li> </ul>	New	GS-11/13 or WYE
CSI	Measurement and Reporting Manager	Measurement and Reporting Manager	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Foundations</li> <li>Technical Data Skills</li> <li>Architectural skills</li> </ul>		
CSI	ITIL Architect	ITIL Expert	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Practitioner</li> <li>Subject Matter Expert</li> </ul>	Existing WYE	
CSI	ITIL Expert	ITIL Expert	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Expert</li> <li>Subject Matter Expert</li> </ul>	Existing WYE	
CSI	Analyst	Analyst	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Practitioner Service Operations</li> <li>ITIL Foundations</li> <li>Analytical skills</li> <li>Technical background</li> </ul>	New	GS-11/13 or WYE
CSI	Measurement and Reporting Analyst	Measurement and Reporting Analyst	FTE or WYE	<ul style="list-style-type: none"> <li>ITIL Foundations</li> <li>Web Development Report</li> </ul>	New	GS-7/9 or WYE
CSI	Measurement and Reporting Administrator	Measurement and Reporting Admin	FTE or WYE	<ul style="list-style-type: none"> <li>Development skills</li> <li>Database skills</li> </ul>	New	GS-7/9 or WYE

\* These positions are preferred, but optional

## 8. USE CASE SCENARIOS

Below are high level use case scenarios targeted at a detailed level sufficient to validate and demonstrate the design functionality. The detail of activities within individual processes is left to the individual process documentation. These use cases provide examples of how ESM operates and typically leverages future training materials. The roles within the use cases are either defined in Section 5.5, or are described by ITIL and commonly found in IT organizations.

To enhance the clarity of which roles are either responsible for the execution of the task or are merely consulted or informed about the task, the RACI nomenclature described in Section 5.5 is used within the following scenarios.

A summary of the use cases included with this ConOps are as follows:

1. Bring existing IT Service into the ESM framework.
2. New Service (e.g., new application)
3. Business makes significant changes in Demand
4. Establish SLA and SLA reports
5. Introducing new ITIL Process
6. Escalation of critical application failure
7. CSI detects SLA approaching breach
8. CSI detects opportunity for ITSM Process improvement
9. CSI discovers an idea to improve a service

## 8.1 BRINGING EXISTING IT SERVICE INTO ESM FRAMEWORK.

**Use Case Narrative:** E-mail has been up and operating ad-hoc. Now it is time to integrate e-mail into the ESM and ITSM framework.

**Preconditions:** ESM and SIM roles are filled. Service Suppliers are in place. Financially the effort is pre-approved.

### RACI Abbreviations:

- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R = SIM Manager C = ESM Manager I = Service Owner	The ESM managers collaborate to appoint a Service Owner (PE)
2	R = Service Owner C = Application Owner C = L3 support C = Service Supplier I = Configuration Mgr	Investigate – begin application profiling effort(s) to establish service dependencies in terms of what component depends on what component to deliver the service. This extends from the logical (location, support group, Configuration Item (CI) Owner) to the physical (software, servers and routers). Note any resilience and redundancy in the service.
3	R = Configuration Mgr C = Service Owner I = Capacity Mgr I = Availability Mgr I = Continuity Mgr	Enter application profiling service dependency data into CMS/CMDB.
4	R = Capacity Mgr C = Service Owner C = Application Owner C = L3 Support I = Meas. Rpt Analyst	Capacity – establish capacity and performance design targets. Determine what performance and capacity characteristics the service can theoretically deliver in terms of throughput and message transaction time. Determine management interface to service and performance and capacity measurement interface.
5	R = Meas. Rpt Analyst C = Knowledge Mgr C = Capacity Mgr C = Event Manager I = Service Owner I = Availability Mgr	Capacity – design measuring framework to measure service demand (number of users and message rate) and message transaction time (robot messages). Design framework to measure underpinning components of the service (in terms of queue lengths, rates and capacity). Design framework to include alerting functionality (Event Management).
6	R = Meas Rpt Analyst C = Knowledge Mgr C = Availability Mgr C = Event Manager I = Service Owner	Availability – design framework to measure service availability (robot messages) including alerting functionality.
7	R = Continuity Mgr C = Availability Mgr C = Service Owner I = Configuration Mgr	Establish Service Continuity Plan including policies. Link in CMS/CMDB.

Step #	Role, Process or Organization	Task Description
8	R = Info Security Mgr R = Meas Rpt Analyst C = Knowledge Mgr C = Capacity Mgr C = Availability Mgr I = Service Owner	Security – establish information security requirements and design any measurement and alerting frameworks.
9	R = Service Supplier C = Meas Rpt Analyst	Implement service measurement and reporting framework designs.
10	R= Meas Rpt Analyst I = Knowledge Mgr I = Capacity Mgr I = Availability Mgr I = Info Security Mgr I = Service Owner I = SLM Mgr	Gather service data (for a minimum of two months) to establish service baselines – answer these questions:  1) What can service actually deliver?  2) How much margin is there?
11	R = SLM Mgr (SIM) C = Capacity Mgr C = Availability Mgr C = Continuity Mgr C = Info Security Mgr C = Service Owner C = Service Supplier I = Configuration Mgr I = Service Desk	Negotiate and establish OLAs.
12	R = SLM Manager C = RM C = Customer C = Service Owner I = Configuration Mgr I = Service Desk I = Portfolio Manager I = Serv Catalog Mgr	Negotiate and establish SLAs based on what measurement and reporting can measure (particularly focusing on Demand) and on OLAs.
13	R = Capacity Mgr R = Availability Mgr R = continuity Mgr R = Info Security Mgr I = SLM Manager I = Service Owner I = Change Manager	Plan any necessary upgrades/downgrades based on major gaps between customer requirements (established via SLA negotiations) and service capabilities. Downgrades are to exploit any possible cost reductions. Submit RFCs.
14	R = Portfolio Manager	Update the Service Portfolio
15	R = Catalog Owner	Update the Service Catalog

**Post Conditions:** Measurement and reporting is capturing service SLA metrics to support SLM and CSI SLAs are in place.

## 8.2 NEW SERVICE – FROM REQUEST FOR CHANGE TO OPERATION

**Use Case Narrative:** The CRM, during a normal service review meeting, learns that the customer needs a new screen sharing collaboration service.

**Preconditions:** At the beginning, the new Service Request is in the CRM’s head.

**RACI Abbreviations:**

- A = Accountable (Both Enterprise Architecture and SIM are accountable for this entire scenario)
- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R = CRM I = Planning CAB	Enters the request for the new service as a RFC for the Planning CAB
2	R = Planning CAB I = Service Strategy I = Portfolio Mgr	RFC forwarded to Service Strategy to begin analysis
3	R = Portfolio Mgmt I = ESM	Update portfolio – Status = Denied
4	R = Service Strategy I = Finance Mgmt I = CRM I = Portfolio Mgmt	Begins Define and Analyze Activities and inform of status
5	R = Financial Mgmt C = Service Supplier	Estimate costs of new service
6	R = Financial Mgmt C = Service Strategy I = CRM	Perform cost benefit analysis. Cost benefit analysis yields positive results.
7	R = Service Strategy I = CRM I = ESM	Complete, approve and Charter activities
8	R = Portfolio Mgmt I = ESM I = Serv. Catalog Mgr	Update Portfolio
9	R = Catalog Mgr I = Customer	Update Service Catalog with new service – Status = Planned
10	R = SIM Mgr C = ESM Mgr I = Service Owner	Select Service Owner
11	R = SIM Mgr C = ESM Mgr I = Project Mgr	Select Project Manager
12	R = SIM Mgr C = ESM Mgr I = Design Team	Select Design Team

Step #	Role, Process or Organization	Task Description
13	R = SIM Mgr C = ESM Mgt C = Service Supplier I = Transition Team	Select Transition Team composed largely of Service Supplier Subject Matter Experts (SMEs)
14	R = Design Team R = Project Mgr C = CRM C = Customer I = SLM Mgr C = Transition Team (Service Supplier)	Establish Customer/Business Requirements and Validation Test
15	R = Design Team R = Project manager C = Transition Team I = SLM Mgr	Establish service requirements, including Service Management tooling and metrics and measurement systems and aspects of: Availability, Capacity, Continuity and Information Security. Establish Service Acceptance Test
16	R = SLM C = Service Owner C = CRM C = Customer C = Service Supplier	Begin SLA and OLA negotiation
17	R = Design Team R = Project Manager C = Transition Team (Service Supplier)	Design Service Solution, User Training and Service Desk Training plans and Service Operational Readiness Test
18	R = Finance Manager C = Project Mgr C = Design Team C = Service Supplier I = ESM	Financial checkpoint. Update costing data. Make go, no-go recommendation. For use case, recommendation is go
19	R = Design Team R = Project manager C = Transition Team (Service Supplier)	Design Service Release plan and Service Release Package Test
20	R = Design Team R = Project Manager C = Transition Team (Service Supplier)	Develop Service Solution and Component and Assembly Test
21	R = SLM Mgr C = Service Owner C = CRM C = Customer C = Service Supplier	Finalize SLAs and OLAs
22	R = Design Team R = Project Mgr I = Transition Team	Forward Design Package to Transition Team. Design Package includes Service Design, Design Requirements, Testing and Training Plans

Step #	Role, Process or Organization	Task Description
23	R = Project manager R = Transition Team (Service Supplier)	Build and Test
24	R = Project Manager R = Transition Team (Service Supplier) I = Configuration Mgr	Update CMDB with service dependency information
25	R = Project Manager R = Transition Team (Service Supplier) I = Users I = Service Desk	Conduct User training. Conduct Service Desk training
26	R = Project Manager R = Transition Team (Service Supplier)	Conduct Component and Assembly Test
27	R = Project Manager R = Transition Team (Service Supplier)	Construct Service Release Package and perform Service Release Package Test
28	R = Project Manager R = Transition Team (Service Supplier)	Distribute Service Release Package and conduct Service Operational Readiness Test
29	R = Project Manager R = Transition Team (Service Supplier)	Conduct Service Acceptance Test
30	R = Project Manager R = Transition Team (Service Supplier)	Conduct Service Validation Test – report that service met business and customer objectives.
31	R = Portfolio Mgmt I = ESM I = Serv. Catalog Mgr	Update Portfolio – Service Status = Operational
32	R = Serv. Catalog Mgr I = Customers I = All	Update Service Catalog with new service – Service Status = Operational

**Post Condition:** Service is up and running in production.

### 8.3 BUSINESS MAKES SIGNIFICANT CHANGES IN DEMAND FOR A PARTICULAR IT SERVICE (EXAMPLE EMAIL)

**Use Case Narrative:** During a Service Review meeting the Center Director states that due to the implementation of Microsoft SharePoint, the Center Director expects e-mail usage to drop to 25% of previous levels as users are no longer sending multi-megabyte files over e-mail. The Center Director also expects the corresponding cost reduction in the service.

**Preconditions:** All supporting ITSM processes are up and running.

**RACI Abbreviations:**

- A = Accountable (Both ESM and the Center CIOs are accountable for this entire scenario)
- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R = CRM I = Change Manager I = Service Owner I = SLM Manager I = Capacity Manager	CRM raises a RFC to request the reduction in service demand.
2	R = Capacity Mgr C = CRM C = SLM Manager	As a CAB member, the Capacity Manager receives the RFC and begins evaluation – Mailbox space can be reduced from 5GB to 1.25GB. Total monthly throughput (in GB/month) for the site is now down to 25% of original. Total number of messages/month will stay about the same. Message transaction timer will stay the same.
3	R = Capacity Manager I = SLM Manager I = Service Manager	Consults CMS/CMDB
4	R = Capacity Manager I = SLM Manager I = Service manager	Consults CMIS to establish current capacity margins and estimate target loading profile.
5	R = Capacity Manager I = SLM Manager I = Service Manager I = Financial Manager	The Capacity consults the current Capacity Plan and assesses impact. Updates the Capacity Plan. Result – half a Storage Area Network (SAN) storage frame can be released, Exchange server can be released.
6	R = financial Manager C = Capacity Manager C = SLM Manager C = Service Owner C = CRM	Establish updated cost of service. Cost of service to a specific site is reduced by only 25%
7	R = CRM R = SLM Manager	The CRM presents the updated SLA to the customer, including the updated Demand requirements and updated costs. The customer,

Step #	Role, Process or Organization	Task Description
	R = Service Owner I = Customer I = Capacity Manager	although expecting deeper cost cuts, accepts the SLA based on the explanation of underpinning costs.
8	R = Capacity Manager I = All	The Capacity Manager updates the Capacity Plan with the customer's accepted plan. Links to service CI in the CMS/CMDB.
9	R = Capacity Manager C = Service Suppliers I = Change Manager	The Capacity Manager updates the RFC with plan details including specific work orders, updated CI data and submits it to the CAB.
10	R = Change Manager C = CAB C = Capacity Manager I = Configuration Mgr	The Change Manager approves the RFC.
11	R = Service Supplier I = Change Manager	The Service Supplier performs the task(s) and updates the RFC status.
12	R = Configuration Mgr I = All	The Configuration Manager updates the service dependency data in the CMS/CMDB and closes the RFC.

**Post Conditions:** The updated service is up and running. The SLA is updated. The Capacity Plan is updated and CMS/CMDB is updated.

## 8.4 ESTABLISH SLA AND SLA REPORTS

**Use Case Narrative:** A new Messaging Service has been approved and will be brought online. Service Supplier B will be supporting this service.

**Preconditions:** The customer's requirements are established. The service is designed and about to enter development. The Service Owner is assigned. Service Supplier B has agreed to an amendment of the contract to support the new messaging service.

### RACI Abbreviations:

- A = Accountable (Both the Project Execs and SIM are accountable for this entire scenario)
- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R=Meas Rpt Mgr C=Design Team C=Knowledge Manager C=CSI Manager I=SLM Manager I=Service Owner	During the Design Phase -- collaborate to establish service metrics and design of the measurement system and methodology to interface with Measurement and Reporting's measurement framework
2	R=SLM Manager C=Service Owner	Review -- review the Service Catalog and the Service Design Package containing: <ol style="list-style-type: none"> <li>1) Customer requirements,</li> <li>2) Design targets,</li> <li>3) Management Architecture and tools, and</li> <li>4) The Measurement System, Methodology and Metrics</li> </ol>
3	R=SLM Manager C=Service Owner C=CRM	Validate that the customer requirements are unchanged
4	R=SLM Manager C=COTR C=Service Supplier C= Meas Rpt Mgr I=Service Owner	Initial Service Level Objective (SLO) -- establishes initial required SLOs and collaborates. Of particular focus is the SLO (Underpinning Contract) to martial service data to the SIM Measurement and Reporting tool. Receive tentative SLO agreement. The Service Supplier (Service Supplier B) will work with the COTRs to update the SOW in the contract modification to support the new service, and supply the required metrics

Step #	Role, Process or Organization	Task Description
5	R=SLM Manager C= Meas Rpt Mgr C=CSI Mgr C=Knowledge Mgr I=Design Team	Finalize reports -- validates that metrics support SLA targets. Validates that thresholds are properly set for alerting. Establish report layout and monthly, year-to-date and week-to-date reporting. Make any necessary changes to Design. Updates Design Package as necessary
6	R= SLM Manager C= Meas Rpt Mgr C=Service Owner	Establishes initial set of SLAs with the following criteria: <ul style="list-style-type: none"> <li>• SLAs are measurable</li> <li>• SLAs are automated if at all possible</li> <li>• SLAs reflect the quality defined in the design requirements</li> </ul>
7	R=SLM Manager C=Customer C=CRM I=Service Owner	SLAs -- Negotiate and sign SLAs with customer. The customer and SLM Manager sign SLAs
8	R=SLM Manager C=COTR C=Service Supplier C= Meas Rpt Mgr I=Service Owner	Finalize SLOs
9	R=SLM Manager I=Configuration Mgr I=Service Desk	Update Configuration Management System/Configuration Management Database (CMS/CMDB) with SLA
10	R= Meas Rpt Mgr R=Service Supplier	Begin development and complete implementation of Measurement and Reporting tool coordinated with Release of Service
11	R= Meas Rpt Mgr I=Customer I=CRM I=SLM Manager I=Service Owner I=ESM Manager I=SIM Manager I=All	SLA and service metric report generation

**Post Conditions:** The SLA is signed and operational. SLOs are agreed to. SLAs and service metrics data are captured, reported and tracked.

## 8.5 INTRODUCING NEW ITIL PROCESS – EXAMPLE AVAILABILITY MANAGEMENT

**Use Case Narrative:** A SIP recommends that SLAs can be better met if there is more focus on Availability provided by bringing up a formal Availability Management (AVM) process.

**Preconditions:** The Service Level manager, several Service Managers and Business Relations managers have finalized the SIP including costs and benefits and presented it to the Enterprise CAB.

### RACI Abbreviations:

- A = Accountable (The SIM is accountable for this entire scenario)
- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R = ESM Manager	Approves SIP from within the Enterprise CAB
2	R = ESM Mgr C = SIM Mgr I = AVM Proc Owner	Collaborates on approach and staffing. Select AVM Process Owner
3	R = SIM Mgr I = AVM Proc Mgr I = PM	Assembles Process Lean Team composed of AVM Process Owner and Project Managers
4	R = PM C = AVM Proc Owner	Construct initial project plan in collaboration with Process Owner
5	R = AVM Proc Owner I = Service Suppliers I = Site Contact(s) I = SLM I = Meas Rpt Analyst I = Service Owner I = PM	Establishes AVM Core Team composed of AVM stakeholders who are empowered to make decisions. These include representation from: <ul style="list-style-type: none"> <li>1) each Service Supplier</li> <li>2) NASA Center</li> <li>3) SLM</li> <li>4) Service Measurement and Reporting Analyst</li> <li>5) Service Owner(s)</li> <li>6) Project Manager.</li> </ul> <p>The core team is responsible for evangelizing the AVM Process and leading the processes implementation going forward</p>
6	R = AVM Proc Owner C = SIM Mgr I = AVM Proc Mgr	Select AVM Process Manager(s).
7	C = AVM Core Team C = AVM Proc Owner C = AVM Mgr	Conduct face-to-face Process Design Workshop. The workshop hit an irresolvable integration issue between AVM and SLM. The issue is raised to

Step #	Role, Process or Organization	Task Description
	C = SIM Mgr	the SIM Manager.
8	R = SIM Mgr C = AVM Proc Owner C = SLM Proc Owner	Consuls with the SLM Process Owner and AVM Process Owner and adjudicates integration issues.
9	R = AVM Core Team	Establish AVM Process use cases to validate logical design
10	R = AVM Core Team	Establishes agreed to AVM process design(s) including: <ul style="list-style-type: none"> <li>1) Process policies</li> <li>2) Swim lanes</li> <li>3) Roles</li> <li>4) RACIs</li> <li>5) KPIs</li> </ul>
11	R = Meas Rpt Analyst C = AVM Core Team C = App Owner	Refer to CMDB to determine dependencies for selected Pilot Service, establish measurements and reports for target Pilot Service.
12	R = Meas Rpt Mgr C = AVM Core Team	Establish Pilot tooling requirements and design to capture and report AVM process metrics and Pilot Service AVM metrics.
13	R = AVM Core Team C = AVM Proc Owner	Establish agreed to Implementation Roadmap including identifying implementation issues and Service Supplier issues. Roadmap includes selection f Pilot Service as part of a plan to implement in stages.
14	R = AVM Proc Owner C = Org Change Mgr C = SIM Mgr	Establish AVM Awareness Campaign Plan.
15	R= AVM Mgr C = AVM Proc Owner C = SIM Mgr	Map AVM roles to staff.
16	R = AVM Proc Mgr C = AVM Proc Owner C = SLM C = Service Owner	Construct initial Availability plan consisting of agreed to Implementation Roadmap, tooling plans and Pilot Service target metrics.
17	R = PM C = AVM Proc Owner	Updates project plan.
18	R = AVM Proc Owner	Enter AVM process design document under Change Management control via a RFC
19	R = AVM Proc Owner R = Transition C = AVM Core Team	Establish AVM (Service) Acceptance Test Plan based on use cases and tooling.
20	R = Proc Owner R = Training Coor C = Org Chg Mgr	Establish AVM Training Plan and material

Step #	Role, Process or Organization	Task Description
21	R = SIM Mgr C = AM Proc Owner	Review and approve overall project plan including: 1) Awareness Campaign Plan 2) Training Plan 3) Initial Availability Plan 4) AVM (Service) Acceptance Test Plan.
22	R = AVM Proc Owner C = Org Chg Mgr	Launch AVM Awareness Campaign
23	R = AVM Process Mgr	Enter initial Availability Plan under Change Management control via a RFC
24	R = Training Coordinator	Conduct AVM training to AVM roles.
25	R = AVM Proc Owner R = AVM Core Team R = AVM Proc Mgr	Build and Test AVM Process solution
26	R = AVM Proc Owner C = AVM Core Team C = AVM Proc Mgr	Conduct AVM (Service) Acceptance Test
27	R = AVM Proc Owner C = CIM Mgr	Given Acceptance Test was successful, declare ready to go-live.

**Post Conditions:** AVM is up and running in production and ready for roll-out across the infrastructure.

## 8.6 ESCALATION – GENERAL CASE, CRITICAL SERVICE IS DOWN

**Use Case Narrative:** The Enterprise Service Desk receives Events and User calls saying that a critical service is down.

**Preconditions:** After attempting all the associated restore scripts at the TIER 1 Service Desk’s disposal, the ESD transfers the Incident to TIER 2 Support. Based on the Incident Record updates, it does not appear the TIER 2 Support can resolve the issue. Further, the ESD receives the warning of an impending SLA breach.

### RACI Abbreviations:

- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R = Incident Manager I = Escalation Mgr	The Incident Manager escalates the Incident to the Escalation Manager and supplies all the background Incident information.
2	R = Escalation Mgr	The Escalation Manager defines the initial Problem statement in terms of When (did the issue start), Who, Where (who can and who can not access the service, if any), What (is the nature of the failure).
3	R = Escalation Mgr I = CRM I = Customer(s) I = ESM I = Service Supplier	Notification of the escalation is sent out, according to The Escalation Communication Plan. Notification includes establishing regularly scheduled escalation status update conference calls.
4	R = Escalation Mgr I = Problem Mgr I = CSI Analyst I = Service Owner I = Site Contact I = Application Owner I = Service Supplier	The CMS/CMDB is consulted to determine service dependency and those owning and supporting the service. Assemble an escalation team of SME and notify with direct e-mail and follow up direct phone call of scheduled conference call.
5	R = Escalation mgr C = Escalation Team	Escalation Manager conducts the initial escalation team call with the escalation team and reviews TIER 2 and TIER 3 Support progress (TIER 2 and TIER 3 have continued their horizontal escalation efforts). Collaborate to establish initial list of possible causes for issue. Establish initial Incident Restoration Plan. Establish ongoing escalation team conference call schedule.
6	R = Escalation Team I = Escalation Mgr	The escalation team executes both the initial Incident Restoration Plan and the updated Problem investigation plan with a bias toward restoring service through a workaround. Create Emergency RFCs as necessary.
7	R = Escalation Mgr I = CRM I = Customer(s)	Conduct an escalation checkpoint status call.

Step #	Role, Process or Organization	Task Description
	I = ESM I = Service Supplier	
8	RC = Escalation Mgr R = Escalation Team I = New Team Staff	Conduct escalation team call. Escalation team reports investigation progress, knowledge gained, potential next steps, and questions to be answered. The Escalation Manager adds to escalation team and releases members as the resolution gains focus. The Escalation Manager collaborates to update the Resolution Plan and Problem Investigation Plan.
9	R = Escalation Team I = Escalation Mgr	The escalation team executes both the updated Incident Restoration Plan and the updated Problem Investigation Plan with a bias toward restoring service through a workaround. Emergency RFCs are raised as necessary.
10	R = Escalation Mgr I = CRM I = Customer(s) I = ESM I = Service Supplier	The Escalation Manager conducts an escalation checkpoint status call.
		<b>Conduct steps 8, 9 and 10 until Service is restored either by a reasonably solid workaround or by removing the root cause.</b>
11	R = Escalation Mgr C = CRM C = Customer(s) I = ESM I = Service Supplier	The Escalation Manager conducts a final escalation checkpoint status call. The Escalation Manager receives the customer's permission to close the Incident ticket(s).
12	R = Escalation Mgr I = Incident Manager	Close the Incident ticket(s).
13	R = Escalation Mgr C = Escalation Team C = CRM C = Customer(s) C = ESM C = Service Supplier	Escalation Manager conducts the Post-Escalation Review, focusing on: <ul style="list-style-type: none"> <li>1) things that were done well</li> <li>2) things that can be improved</li> <li>3) workaround that finally restored the service</li> <li>4) knowledge gained</li> <li>5) (any) additional efforts for Problem Management</li> <li>6) (any) RFCs to be submitted.</li> </ul>
14	R = Escalation Mgr I = Problem Mgmt	Escalation Manager follows up with Problem Management to ensure that any necessary Problem records are created.
15	R = Escalation Mgr I = Change Mgmt	Escalation Manager will create any required RFCs.

Step #	Role, Process or Organization	Task Description
16	R = Escalation Mgr I = CIO I = Escalation Team I = CRM I = Customer(s) I = ESM I = Service Supplier	The Escalation Manager documents the Post Escalation Review. Links to the service CI in the CMS/CMDB. Distributes the review.

**Post Conditions:** Service is up and running. The initiating Incident ticket(s) is closed.

**Notes:** Additional Problem and Change Management activities may still be underway.

## 8.7 CSI DETECTS SLA APPROACHING BREACH

**Use Case Narrative:** The SIM Manager, upon reviewing the outages of the NASA Web Portal, notices a trend of outages, which though within SLA parameters, could breach the SLA if the trend continues.

**Preconditions:** Service Supplier A's contract maintains the web hosting servers, and Service Supplier B's contract includes the Web Portal management.

### RACI Abbreviations:

- A = Accountable (The SIM is accountable for this entire scenario)
- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R = SIM Manager C = Analyst	The SIM Manager detects a possible impending breach, and requests the Analyst review the data for corroboration.
2	R = Analyst I = SIM Manager	The Analyst reviews the data and runs a trend analysis proving there is an impending breach
3	R = Analyst I = COTRs	The Analyst creates an Incident ticket and alerts the COTRs of the two Service Suppliers involved.
4	R = Incident Mgmt C = Service Supplier A C = Service Supplier B I = Analyst I = Service Ops Mgr	An Incident ticket is worked by Service Suppliers under Incident Management.
5	R = Service Supplier A I = Change Mgr I = Incident Mgr I = Analyst I = Service Ops Mgr C = Service Supplier B	A RFC for a Government Furnished Equipment (GFE) Server is created by Service Supplier A.
6	R = Change Mgr I = Evaluation Mgr I = Incident Mgr I = Service Ops Mgr	Because the item is GFE, the Change Manager notifies the Evaluation Manager.
7	R = Evaluation Mgr C = COTRs C = Financial Manager C = Service Supplier B C = Enterprise Architecture	The Evaluation Manager confirms with the COTRs and Financial Management that the GFE can be changed, that the contracts allow the Change, and the Change will not affect other services.
8	R = Change Manager C = CAB I = Service Ops Mgr	A CAB is convened, and the RFC is approved.

Step #	Role, Process or Organization	Task Description
9	R = Rel & Depl Mgmt C = Service Supplier A I = Change Manager I = Incident Manager I = Service Desk I = Service Ops Mgr	Service Supplier A installs the Change under Release and Deployment Management.
10	R = Evaluation Mgr C = COTRs C = Financial Manager C = Service Supplier B C = Enterprise Architecture	The Evaluation Manager reviews to ensure the Change meets the stated purpose.
11	R = Incident Mgmt C = Service Supplier A I = Service Desk I = Service Ops Mgr	The Incident ticket is closed.
12	R = Change Mgr C = Rel & Depl Mgmt C = Incident Mgmt I = Analyst I = SIM Manager	A Post Implementation Review is conducted to ensure success.

**Post Conditions:** The upgrade has been installed and the trend has been mitigated. An outage does not occur.

**Notes:** Given the issue that is found, there will be variations on this flow, such as major Changes requiring testing or more than two Service Suppliers being involved, etc.

## 8.8 CSI DETECTS OPPORTUNITY FOR ITIL PROCESS IMPROVEMENT

**Use Case Narrative:** CSI, while reviewing post implementation reviews, has noticed that when a Cost Benefit Analysis or a Return on Investment Analysis is requested by the Change Manager for a Change, it is completed before Enterprise Architecture reviews the Change, thus adding a week to the Evaluation.

**Preconditions:** Both the Change Management and Evaluation Process are documented and each has a manager and owner. Process Changes have to be approved by Enterprise Change Management, and once approved Organizational Change Management is tasked with implementation.

### RACI Abbreviations:

- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R=CSI Manager C=Chg Proc Owner C=Eval Proc Owner I=Change Manager I=Evaluation Manager I=SIM Manager	CSI works with the two Process Owners, and identifies that the Evaluation Process documentation is unclear. The issue is whether the work is done in parallel or sequentially.
2	R=Eval Proc Owner C= Eval Manager C=Ent Architecture C=Financial Mgr I=Change Manager I=Evaluation Mgr I=SIM Manager I=CSI Manager	The Evaluation Process Owner, in conjunction with the Evaluation Manager, works with Enterprise Architecture and the Financial Manager to see if this part of the process can be done in parallel. The answer is yes, they can be run in parallel.
3	R=Eval Proc Owner C= Eval Manager C=Org Change Mgr I=Financial Manager I=Ent Architecture I=Change Manager I=SIM Manager I=CSI Manager	The Evaluation Process Owner works with Organizational Change Management, and the Evaluation Manager to draft a Change to the Evaluation Process documentation, that clearly shows that the two tasks can be performed in parallel.
4	R= Eval Proc Owner I=Change Manager I=SIM Manager I=CSI Manager	The Evaluation Process Owner submits an RFC
5	R=Change Manger I=CAB I=Eval Proc Owner	The Change Manager schedules an Enterprise CAB

Step #	Role, Process or Organization	Task Description
6	R=Change Manger C=CAB C=Eval Proc Owner I=Org Change Mgr	The Enterprise CAB is held, and the Change Manager approves the RFC.
7	R=Org Change Mgr C=Eval Proc Owner C=Eval Manager I=Financial Manager I=Ent Architecture I=SIM Manager I=CSI Manager	Organizational Change Management develops an awareness campaign to ensure that those affected by this Change (Enterprise Architecture, and Financial Management) are fully aware of the Change. The campaign consists of a scheduled meeting with both parties, and the Change is set to be effective at midnight after the meeting.
8	R=Change Manager C=Org Change Mgr C=Eval Proc Owner C=CSI Manager I=SIM Manager	A post implementation review is held, and the average time for an evaluation completion is compared to that before the process Change. The analysis shows a reduction of four (4) days on the average.

**Post Condition:** Major Changes now move through the process more efficiently.

## 8.9 CSI DISCOVERS AN IDEA TO IMPROVE A SERVICE

**Use Case Narrative:** CSI Manager reads an article in an industry magazine describing a new router technology that will greatly increase throughput on a wide area network. Possibly this technology could increase the productivity of NASA employees.

**Preconditions:** Service Supplier A's contract maintains the NASA network and the servers.

**RACI Abbreviations:**

- R = Responsible
- C = Consulted
- I = Informed

Step #	Role, Process or Organization	Task Description
1	R = CSI Manager C = Analyst	The CSI Manager reviews the literature and gets basic pricing on replacing the current routers on the NASA network. The CSI Manager is aided in this by the analyst
2	R = CSI Manager I = Change Manager	CSI manager submits a RFC
3	R = Change Manager I = CAB I = Service Supplier A	The Change Manager reviews and accepts the RFC. It is scheduled for the next Enterprise CAB.
4	R = Change Manager C = CAB C = Service Supplier A I = Evaluation Manager I = Enterprise Architecture I = Financial Manager	The CAB approves the researching and evaluation of the Change.
5	R = Eval Manager C = Enterprise Architecture C = Financial Manager	The Evaluation Manager invokes the Evaluation Process, and then reviews the results and prepares a report for the Enterprise CAB.
6	R = Change Mgr C = Enterprise Architecture C = Financial manager C = CAB I = CSI Manager	The reports are reviewed by the Enterprise CAB members and the Change Manager. The cost benefit analysis performed by the Financial Manager shows that the cost far exceeds the benefits, and the return on investment is 6 years. The CAB advises against approval. The Change Manager rejects the RFC.
7	R = Change Manager I = CSI Manager	The RFC is closed

**Post Conditions:** The service has not been approved, but a large expenditure with little return has been avoided.

**Notes:** Had the Change been approved, the flow that appears in Use Case 7 would have been followed.

## APPENDIX A – ACRONYMS

Acronym	Meaning
A&I	Architecture and Infrastructure
API	Applications Program Interface
AVM	Availability Management
CAB	Change Advisory Board
CHM	Change Management
CI	Configuration Item
CIO	Chief Information Officer
CMDB	Configuration Management Database
CMS	Configuration Management System
ConOps	Concept of Operations
COTR	Contracting Officer Technical Representative
COTS	Commercial Off-the-Shelf
CRM	Customer Relationship Manager
CSI	Continuous Service Improvement
DHS	Department of Homeland Security
EA	Enterprise Architecture
EPM	Enterprise Portfolio Management
FTE	Full Time Equivalent
GFE	Government Furnished Equipment
INB	Interdisziplinärer Normenbereich Secteur Interdisciplinaire de Normalisation
IT	Information Technology
ITIL	Information Technology Infrastructure Library
ITSM	Information Technology Service Management
IV&V	Independent Validation and Verification
KPI	Key Performance Indicator
OCIO	Office of the Chief Information Officer
OGC	Office of Government Commerce

<b>Acronym</b>	<b>Meaning</b>
OLA	Operational Level Agreement
P&I	Policy and Investment
PE	Project Executives
PM	Project Manager
PWS	Proposed Work Statement
RACI	Responsibility, Accountability, Consulted, Informed
RFC	Request for Change
SAN	Storage Area Network
SD	Service Desk
SE&I	Systems Engineering and Integration
SIM	Service Integration Management
SIP	Service Improvement Plan
SKMS	Service Knowledge Management System
SLA	Service Level Agreement
SLM	Service Level Management
SLO	Service Level Objective
SLR	Service Level Requirement
SME	Subject Matter Expert
ESM	Enterprise Service Management
SOW	Statement of Work

## APPENDIX B – ITSM OVERVIEW

This appendix provides a high level overview of ITSM and ITIL. The following descriptions and definitions are for terms used throughout this document.

**Service** – A means of delivering value to customers by facilitating outcomes customers want to achieve, without the ownership of specific costs and risks. A service can be made up of hardware, software and communication facilities, but is perceived by the customers as a self-contained, coherent entity.

- A set of related functions
- Provided by IT
- The support of one or more business area
- As viewed by the customer and user.

**ITSM** – A set of specialized organizational capabilities for providing value to customers in the form of services. ITSM is what enables a service provider to understand the services they are providing, to ensure that the services really do facilitate the outcomes their customers want, to understand the value of the services to their customers and to understand and manage all of the costs and risks associated with these services. The International Standard for ITSM is ISO-20000.

- Philosophically centered on the customer's perspective of IT's contribution to the business.
- ITSM stands in deliberate contrast to technology-centered approaches to IT management and business interaction.

**ITIL** – Is a public framework that describes best practice in ITSM. It provides a framework for the governance of IT, and focuses on the continual measurement and improvement of the quality of IT service delivered, from both a business and a customer perspective.

- ITIL is the most widely accepted approach to ITSM in the world.
- ITIL provides a cohesive set of best practice, drawn from the public and private sectors internationally.
- It is supported by
  - A comprehensive qualifications system
  - Accredited training organizations
  - Implementation and assessment tools

ITIL was developed in the late 1980's and early 1990's as an operational framework for IT shops. It has been, and is being, successfully used throughout the world, and has become the de-facto standard. In June 2007, ITIL version 3 was published, bringing it up to date, and introducing the lifecycle management of services.

With the advent of ITIL version 3, the processes and functions (Figure 9) were broken down in to the lifecycle phases of a service, from the initial definition and analysis of business requirements in Service Strategy, and Service Design, through migration into the live environment within Service Transitions, to live operation and improvement in Service Operations and CSI.



**Figure 10 - ITIL v.3 Lifecycle and Processes**

ITSM is the goal that NASA IT has established. ITIL is the framework that will carry NASA IT to reach their goal. Along the way, ISO 20000 can be used as an outside, independent, tool to measure the success of this venture. ITIL itself has numerous internal metrics and measures to achieve quality and progress. Section 5.9 describes these metrics in more detail.

**Service Strategy Lifecycle** – Sets the methodology to ensure that the services provided or proposed to customers deliver sufficient value in the form of outcomes that the customer wants to achieve. It ensures that the money and time spent are on requirements which meet the customer’s needs. Included are:

- **Financial Management** – The functions and processes responsible for managing an IT service provider’s budgeting, accounting, and changing requirements. It provides the business and IT with the quantification, in financial terms, of the value of IT services, the value of the assets underlying the provisioning of those services, and the qualification of operational forecasting

- **Service Portfolio Management** – Involves the proactive management of the investment across the service lifecycle, including those services in the concept, design, and transition pipeline, as well as live services defined in the various service catalogues and retired services.
- **Demand Management** – Understands and influences customer demand for services and the provision of capacity to meet those demands. At a strategic level this can involve analysis of patterns of business activity and user profiles. At a tactical level it can involve use of differential charging to encourage customers to use IT services at less active times.
- **Strategy Generation** – Understands the relation between services and strategies, the customers, the opportunities, and classifies and visualizes services. It defines value networks and performs satiric assessments, sets objectives, defines Critical Success Factors, and prioritizes investments.

**Service Design Lifecycle** – The design of appropriate and innovative IT services, including their architectures, processes, policies, and documentation, to meet current and future agreed business requirements. Service Design starts with a set of business requirements, and ends with the development of a service solution designed to meet documented business requirements, and outcomes, and to provide a Service Design Package for hand over to Service Transition. Included are:

- **Service Catalogue Management** – Provides a central source of information of the IT services delivered to the business by the organization, enduring business areas can view an accurate, consistent picture of the IT services available, their details and status.
- **Service Level Management** – Negotiates, agrees, and documents appropriate IT service targets with the business, and then monitors and produces reports on delivery against the agreed level of service.
- **Capacity Management** – Monitors and controls business, service, and component capacity across the service lifecycle. Provides a point of focus and management for all capacity and performance-related issues, relating to both services and resources, matching the capacity of IT to the agreed business demands
- **Availability Management** – Monitors and controls availability of services, components, and resources across the service lifecycle. Provides a point of focus and management for all availability-related issues, relating to services, and ensuring that availability targets in all areas are measured and achieved, and that they match or exceed the current and future agreed to needs of the business in a cost effective manner
- **IT Service Continuity Management** – Maintains the appropriate ongoing recovery capability with IT services to match the agreed needs, requirements, and timescales of the business.
- **Information Security Management** – Aligns IT security with business security and ensures that information security is effectively managed in all service and Service Management activities. Information Security is part of the overall corporate governance framework
- **Supplier Management** – Ensures that suppliers and the services they provide are managed to support IT service targets and business expectations

**Service Transition Lifecycle** – Delivers services that are required by the business into operational use. Service Transition receives the Service Design Package from the Service Design phase and delivers it to the Service Operations phase, every necessary element required for ongoing operation and support of that service. Included are:

- **Change Management** – Ensures Changes are recorded, evaluated, authorized, prioritized, planned, tested, implemented, documented, and reviewed in a controlled manner
- **Service Asset and Configuration Management** – Supports the business by providing accurate information and control across all assets and relationships that make up an organization’s infrastructure. This can extend to non-IT assets and to internal and external service providers, where shared assets need to be controlled
- **Knowledge Management** – Ensures that the right person has the right knowledge, at the right time to deliver and support the services required by the business
- **Transition Planning and Support** – Plans and coordinates the resources to ensure the requirements of Service Strategy, encoded in Service Design are effectively realized in Service Operations. It identifies, manages, and controls the risks of failure and disruption across transition activities
- **Release and Deployment Management** – Assembles and positions all aspects of services into production and establishes effective use of new or Changed services
- **Service Validation and Testing** – Tests all services appropriately, providing validation that business requirements can be met in the full range of expected situations, to the extent of agreed business risk
- **Evaluation** – Ensures the service will be useful to the business. It will also ensure that the service remains relevant by establishing appropriate metrics and measurement techniques

**Service Operation Lifecycle** – Delivers agreed levels of service to users and customers, and manages the applications, technology, and infrastructure that supports the delivery of the services. It is only during this stage of the lifecycle that services actually deliver value to the business, and it is the responsibility of Service Operation to ensure this value is delivered. Included are:

- **Event Management** – Generates and detects notifications, while monitoring the status of components. Generates the appropriate response to each event both manually and automatically
- **Incident Management** – Restores normal service as quickly as possible, minimizing the adverse impact on business operations
- **Request Fulfillment** – Enables users to request and receive standard services; to source and deliver these services; to provide information to users and customers about services and procedures for obtaining them; and assist with general information, complaints and comments
- **Access Management** – Provides the rights for users to be able to access a service or group of services, while preventing access to non-authorized users. Helps manage confidentiality, availability, and integrity of data and intellectual property
- **Problem Management** – Prevents Problems and resulting Incidents from happening, eliminating recurring Incidents, and minimizing the impact of Incidents that cannot be prevented. Diagnoses the cause of Incidents, determines the resolution, and ensures the resolution is implemented

**Service Functions** – Along with processes, ITIL has identified four key functions required for ITSM. They are:

- **Service Desk** – Provides a single central point of contact for all users of IT. The Service Desk usually logs and manages all Incidents, service requests and access requests, and provides an interface for all other Service Operations processes and activities

- **Technical Management** – Includes all the people who provide technical expertise and management of the IT infrastructure. Helps to plan, implement, and maintain a stable technical infrastructure and ensure that required resources and expertise are in place to design, build, transition, operate, and improve the IT services and supporting technology
- **Application Management** – Includes all the people who provide technical expertise and management of applications. Carries out a very similar role to Technical Management, but with a focus on software applications rather than infrastructure
- **IT Operations Management** – Responsible for the management and maintenance of the IT infrastructure required to deliver the agreed level of IT services. It is divided into IT Operations Control and Facilities Management

**Continual Service Improvement Lifecycle** – Concerned with maintaining value for customers through the continual evaluation and improvement of the quality of services and the overall maturity of the ITSM Service Lifecycle and underlying processes. CSI performs this through a 7-step improvement process. Included are:

- **Service Measurement** – Validates previous decisions made, directs activities in order to meet targets, justifies the courses of action required, and intervenes at the appropriate point to take action. It does this through analyzing technical metrics, process metrics, and service metrics
- **Service Reporting** – Organizes data into informational reports for sound decision making

All of these lifecycles, processes, and functions are brought together in a communicative and mutually supportive framework of best practices.