

NASA

**IT Problem Management Process Document
Version 1.0**

April 17, 2009

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Document Abstract

This document provides all involved parties (including staff, management, partners, providers, and contractors), regardless of physical location with a guide and reference to **NASA's** IT problem management processes, procedures, and standards.

Document Owner

The IT problem management process document is owned by the Architecture and Infrastructure Division within the NASA Office of the Chief Information Officer.

Revision History

Version	1.0
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Authors	
Problems	
Approval:	
Next Revision:	

IT Problem Management Purpose

NASA recognizes the need to establish reasonable guidelines for the effective use, management, and maintenance of underlying IT problem management. In doing so, **NASA** seeks to protect the integrity of its production environment and ensure adherence to NASA standard IT service management practices.

The purpose of this document is to provide all involved parties (including staff, management, partners, providers, and contractors), regardless of physical location with a guide and reference to **NASA's** IT problem management processes, procedures, and standards.

This document also serves to ensure that all parties involved in **NASA's** IT problem management processes, procedures, and standards, understand the requirements associated with **NASA's** IT problem management processes, procedures, and standards.

IT Problem Management Scope

This document is intended to cover all IT problems associated with **NASA's** IT environment including, but not limited to:

- Internal customers
- External customers
- Technology partners
- HW
- SW
- Operating Systems
- Applications
- Telecommunications
- Networks
- Systems
- Patches, Upgrades, Modifications
- People/Organizational Structure
- Process
- Service Levels

IT Problem Management Description

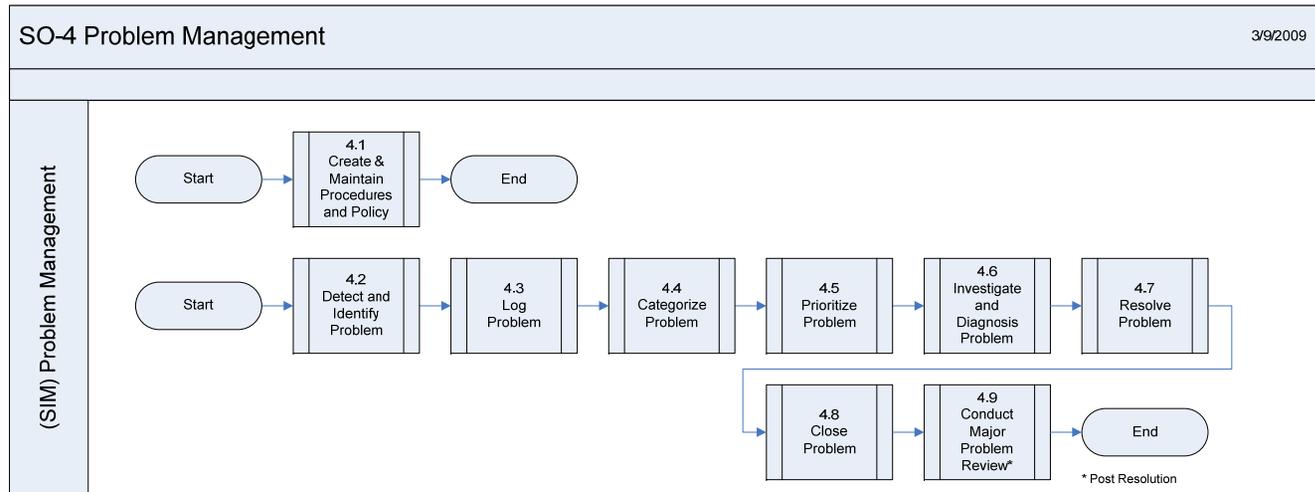
The IT problem management process at **NASA** is a complex set of tasks, activities, and functions that manage the resolution of any/all incidents relating to the IT environment. The IT problem management process is responsible for the recording and management, both reactive and proactive, of all IT problem information, scheduling and related activities.

The IT problem management process at **NASA** is comprised of the following tasks:

- Identification of problems
 - The identification of problems may occur at any point in a systems lifecycle and may be identified by virtually anyone within the organization. Problem identification is often highly integrated with incident management.
- Logging of problems
 - The logging of problems is the task which documents that a problem has occurred and registers the problem with the IT community to take necessary action. Problem logging is necessary for effective problem tracking and information management. Logging of problems often occurs in a tracking ticket and workflow management tool (e.g., Remedy/BMC, Peregrine/HP).
- Checking for known errors
 - Problems do not occur in a vacuum, and many problems have been experienced before. Checking for known errors enables individuals to review information about past problems and possibly leverage information regarding their resolutions.
- Problem classification
 - Problem urgency is not identical for every problem. Problem classification enables the organization to effectively take problem information, group problems based on a categorization scheme, and identify which problems should be addressed first. The problem classification scheme often matches closely with the change management categorization scheme.
- Allocation of problems for action
 - Problem allocation is the activity in which individuals/groups are made responsible for resolving particular problems. Depending on the problem's impact/urgency, it is not uncommon that individuals that identify and record the problem may indeed make themselves responsible for resolving the problem.
- Problem diagnosis
 - Problem diagnosis seeks to review all information regarding the problem and determine what actions, if any, are appropriate for resolving the problem.
- Problem workarounds
 - Problem workarounds are actions that are undertaken simply to help to restore service and do not guarantee that the problem will not return.
- Change requests (for problem resolution)
 - Change requests are made to authorize, schedule, and manage any/all system alterations. The resolution of problems often requires an alteration to the environment, and thus requires a change request be made.
- Management reporting

- Problems have varying impacts on the business community. It is reasonable to expect that while problems are being addressed, that information (e.g., cost of resolution, timing) is passed to management.
- Problem ticket closure
 - Once a problem has been resolved, those responsible for resolving the problem should finalize any information related to the problem and its resolution. The ticket may then be finalized and “technically closed”. “Technically closed” means the assigned technician will complete the entries and annotations regarding all actions taken and will update the technical data in the tracking ticket. If there is a configuration change to a Configuration Item the Configuration Management Database shall be appropriately updated. NASA OCIO Architecture and Infrastructure policy regarding the closure of an incident, problem, or service request requires a customer survey be conducted and appropriate annotations be entered in the tracking ticket information be entered. The Enterprise Service Desk is the only organization authorized to close a tracking ticket.
- Trend analysis
 - Periodic review of problem management information and performance trends help to ensure that gradual degradations in performance and potential simplifications/improvements to systems are addressed before problems/incidents occur.
- Proactive support
 - Proactive support is the collection of activities that help to ensure that gradual degradations in performance and potential simplifications/improvements to systems are addressed before problems/incidents occur.
- Communication
 - Ongoing communication regarding reactive and proactive problem management information is necessary to ensure IT and its customers’ have the most current information about the environment and that expectations are appropriately set.

IT Problem Management Process Flow



Purpose, Goals and Objectives:

The main purpose for the Problem Management Process is oversight and management of the lifecycle of all problems. The primary objectives are 1) to prevent problems and resulting incidents from happening, 2) to eliminate recurring incidents, and 3) to minimize the impact of incidents that cannot be prevented.

Triggers:

The vast majority of Problem Records will be triggered in reaction to one or more incidents, and many will be raised or initiated via Service Desk staff. Suppliers may trigger the need through notification of potential faults.

Primary Interfaces:

Change Management – All resolutions or workarounds requiring a change to a CI are submitted through Change Management via RFC.
Configuration Management – CMS is used to identify faulty CIs and determine the impact of problems and resolutions.
Release and Deployment Management – responsible for rolling out problem fixes into the live environment.
Availability Management – to determine how to reduce downtime and increase uptime requires a close interface with Problem Management especially the proactive areas.
Capacity Management – assists in assessing proactive measures; Problem Management provides management information relative to quality of decisions made during the Capacity Planning process.
IT Service Continuity – PM acts as an entry point into Service Continuity Management where a significant problem is not resolved prior to it starts to have a major impact on the business.
Service Level Management – PM contributes to improvements in service levels, and its management information is used on SLA review components.
Financial Management – Assess the impact of proposed solutions or workarounds; PM provides management information about the cost of resolving and preventing problems.

Information Management:

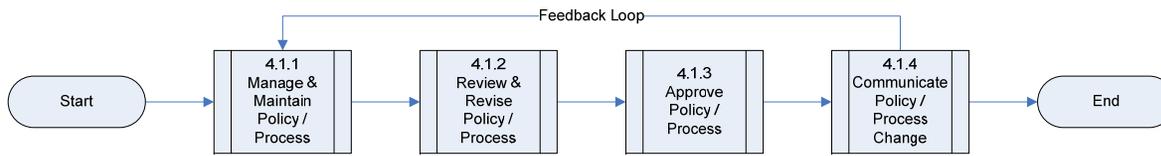
The Configuration management system details all the components of the IT infrastructure, as well as the relationship between these components.
Known Error Database, the purpose of which is to allow storage of previous knowledge of incidents and problems. Plus resolutions for review, and leverage to resolve similar and/or new problems.

SO-4.1 Create and Maintain Problem Management Procedures and Policies

3/9/2009

NASA Business
User
Community

(SIM) Problem
Management



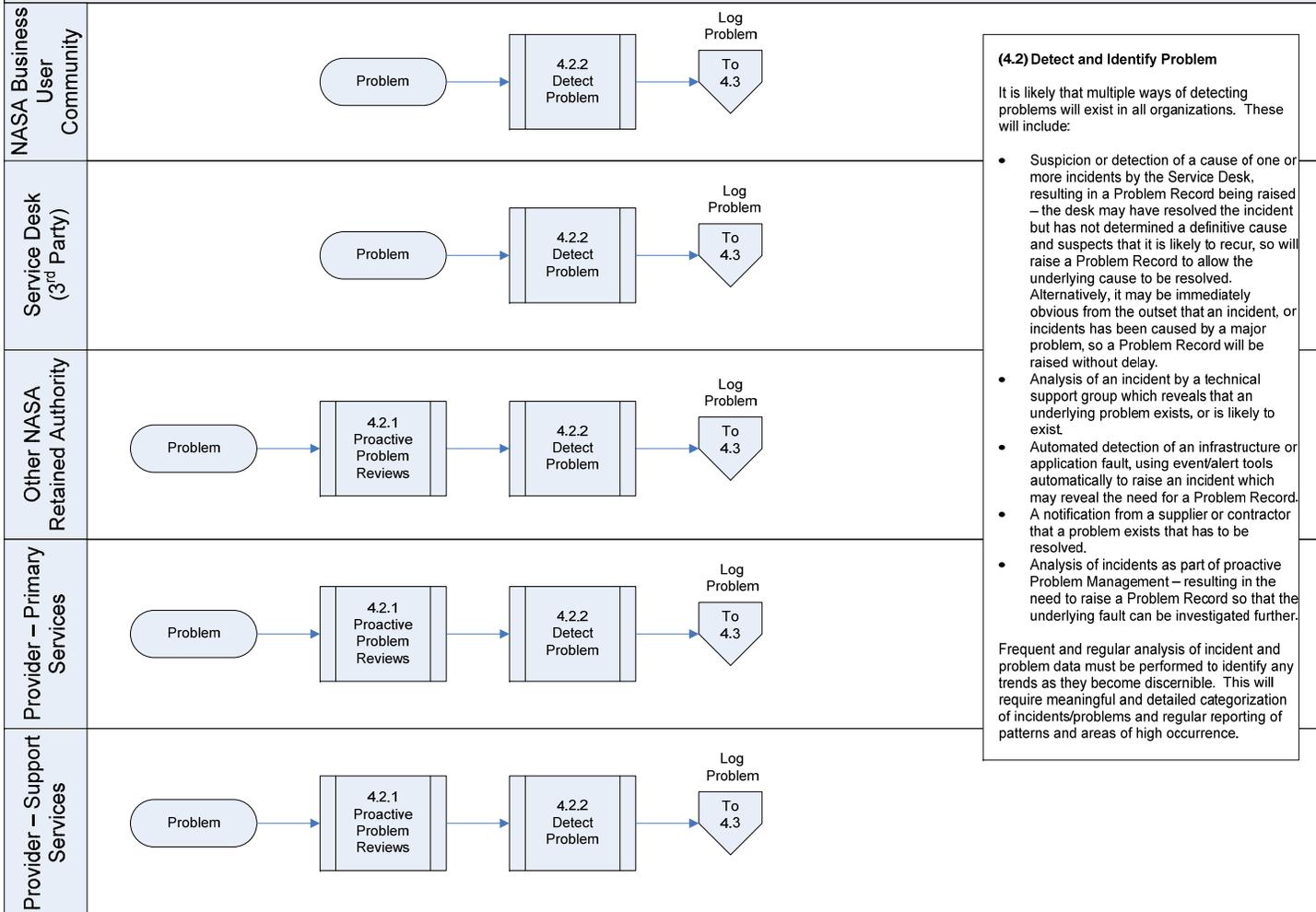
Other NASA
Retained Authority

Provider – Primary
Services

Provider – Support
Services

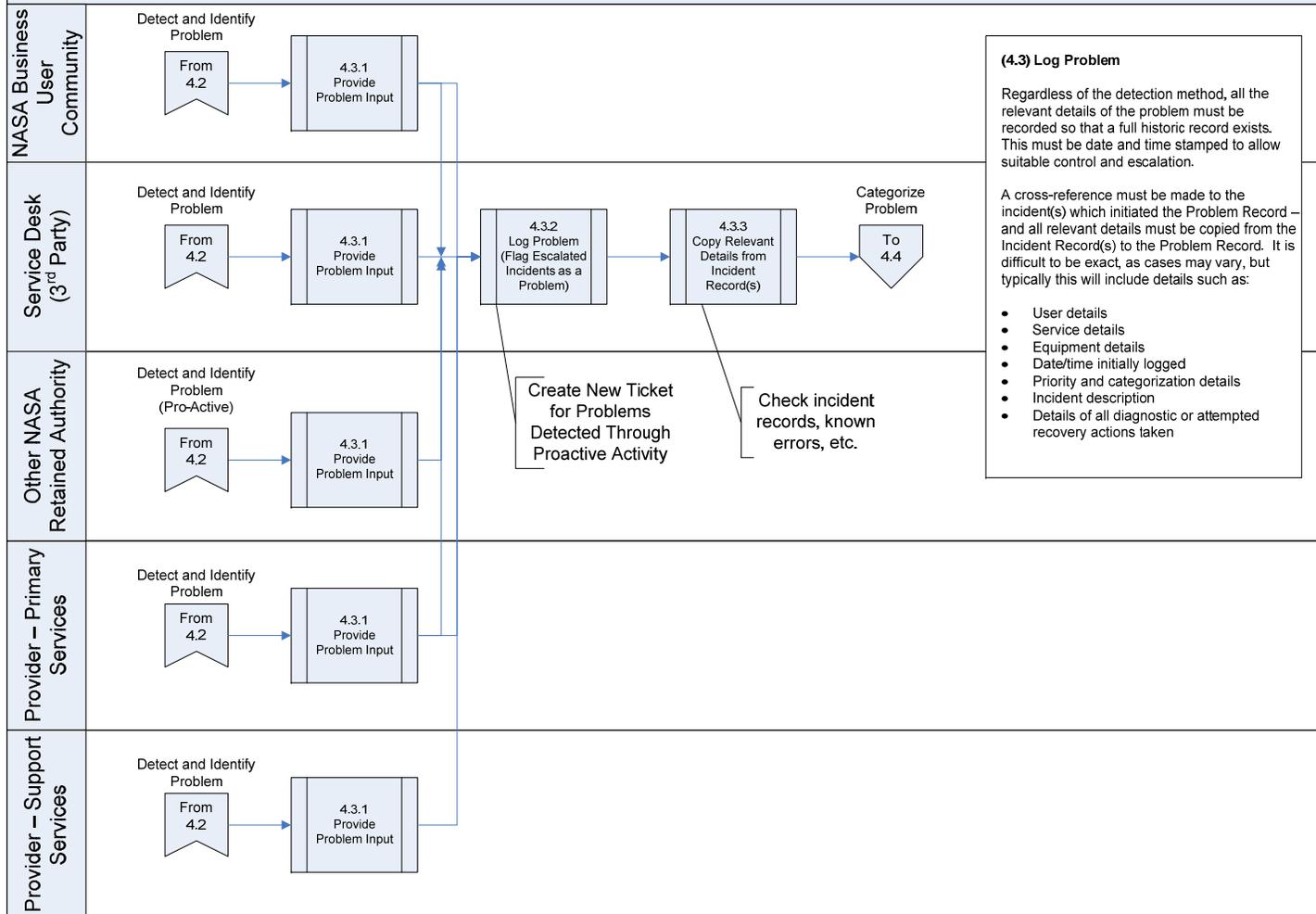
SO-4.2 Detect and Identify Problem

3/9/2009



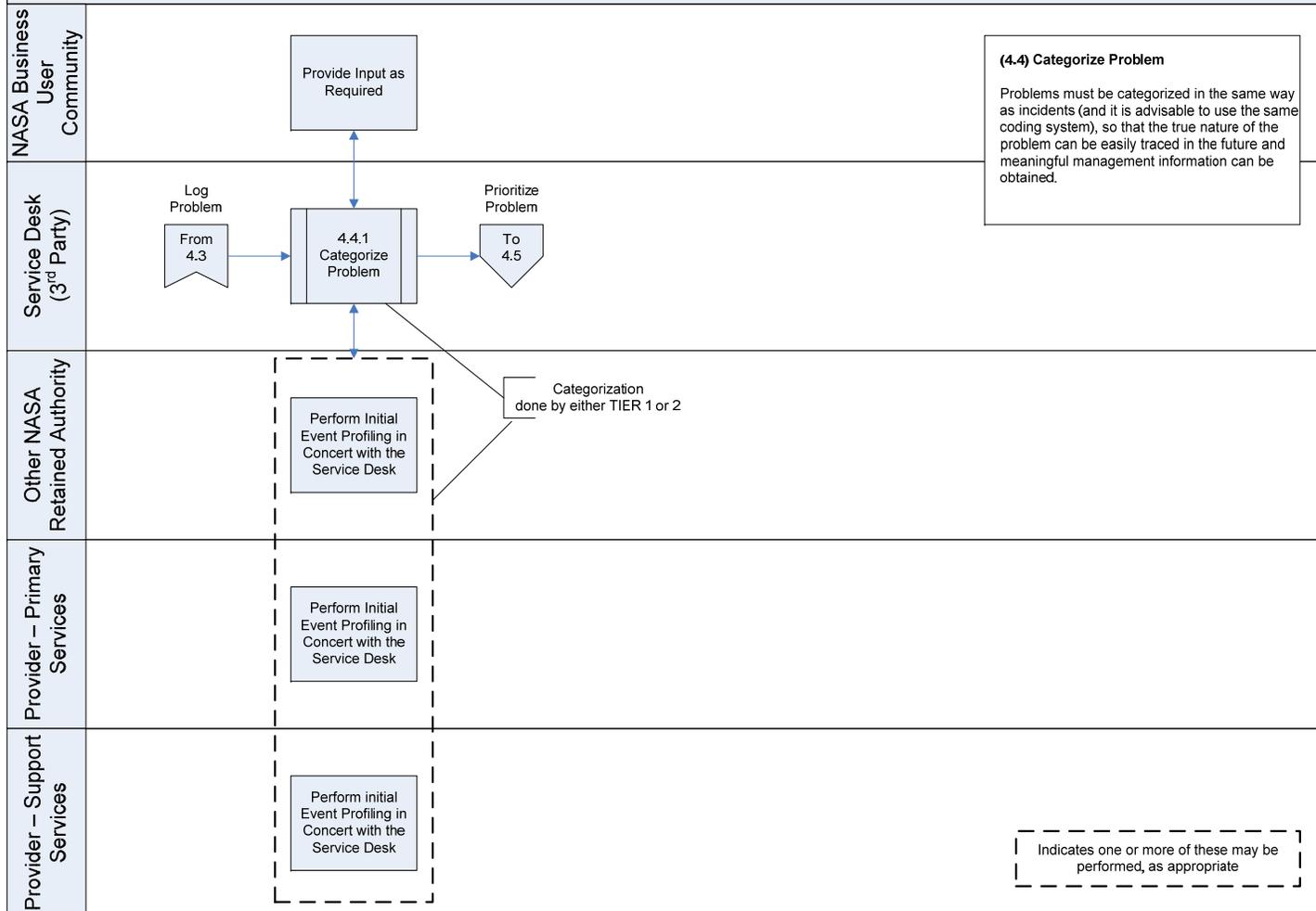
SO-4.3 Log Problem

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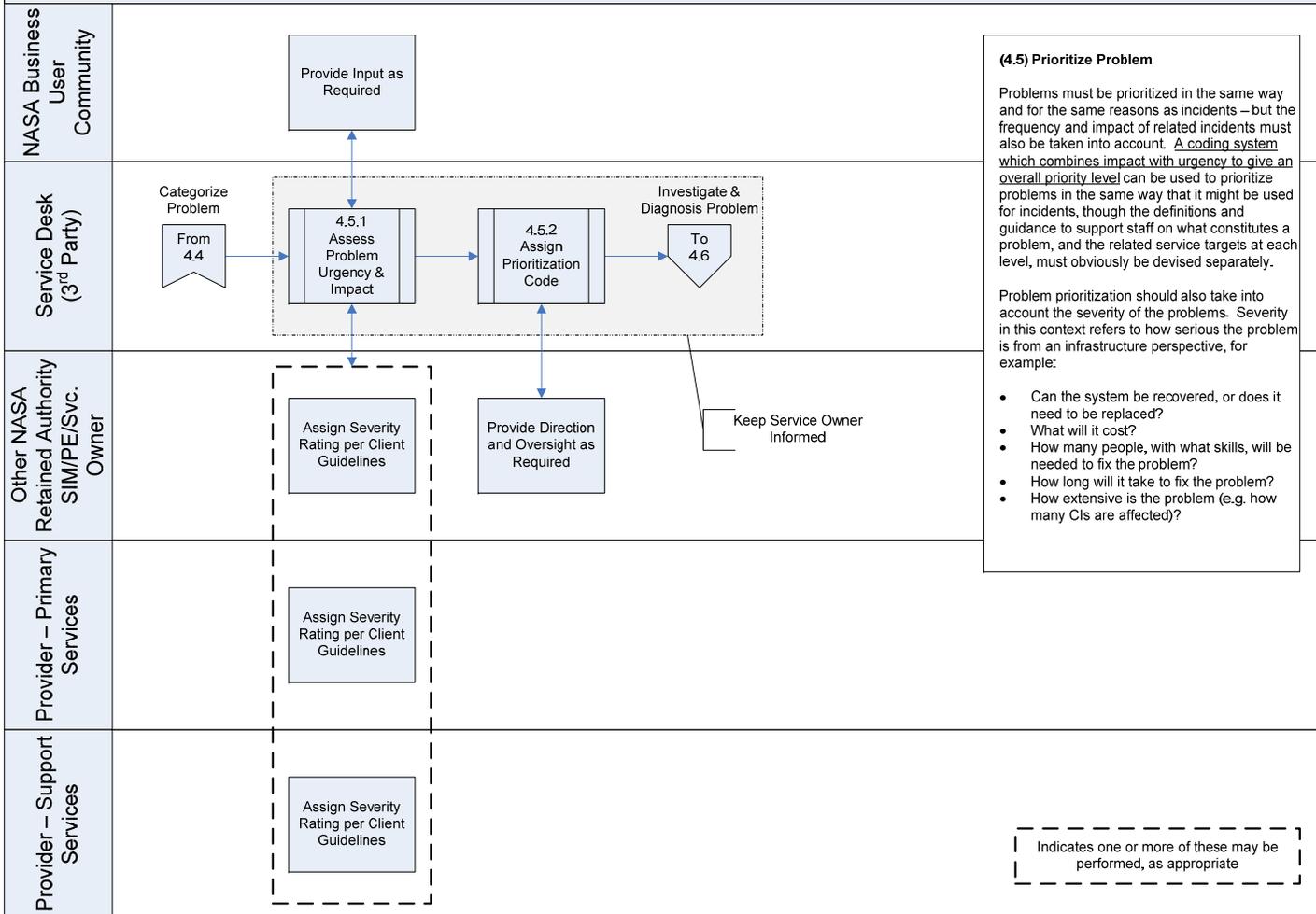
SO-4.4 Categorize Problem

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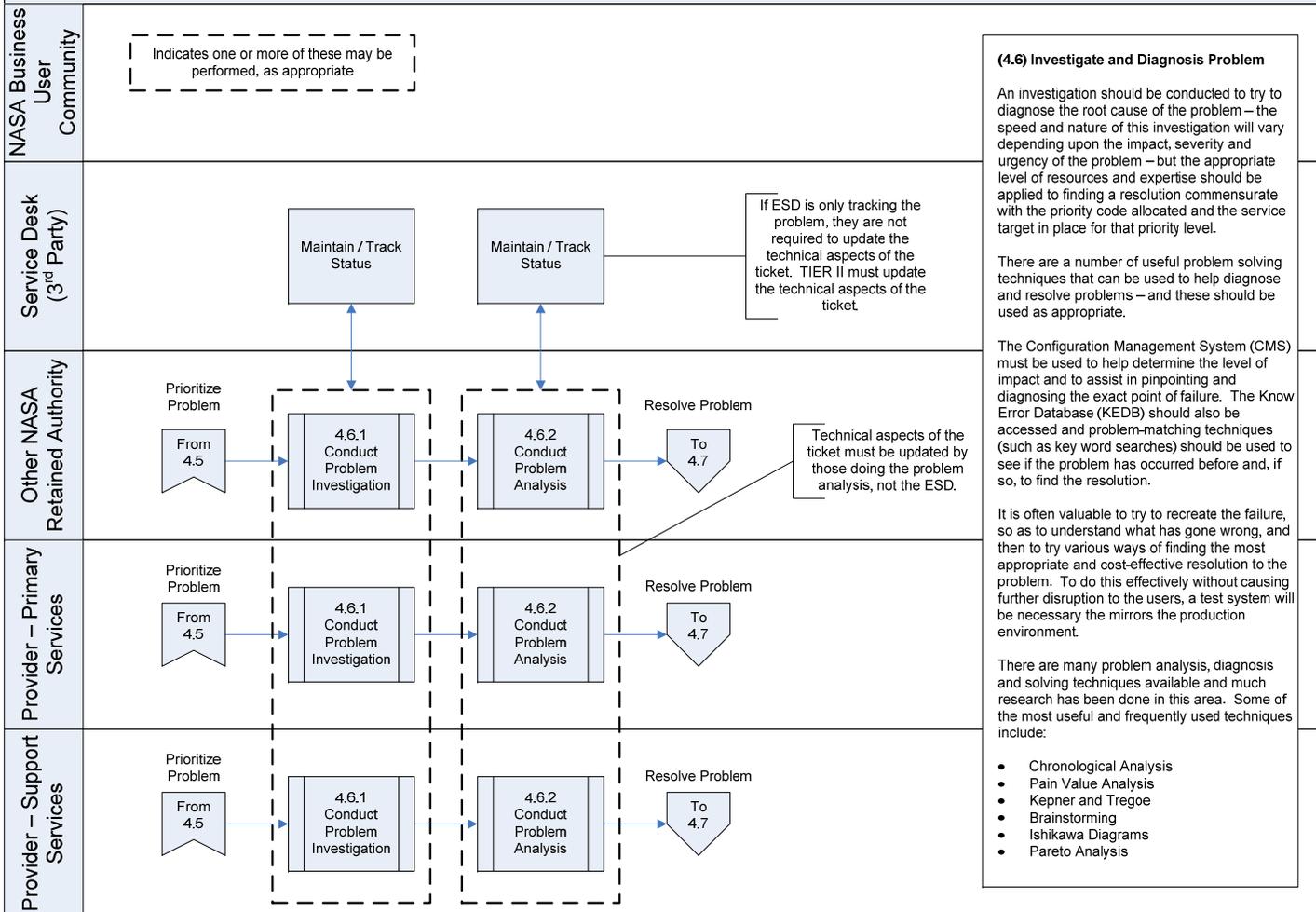
SO-4.5 Prioritize Problem

3/9/2009



SO-4.6 Investigate and Diagnosis Problem

3/9/2009



SO-4.7 Resolve Problem

3/9/2009

NASA Business User Community

Service Desk (3rd Party)

Other NASA Retained Authority

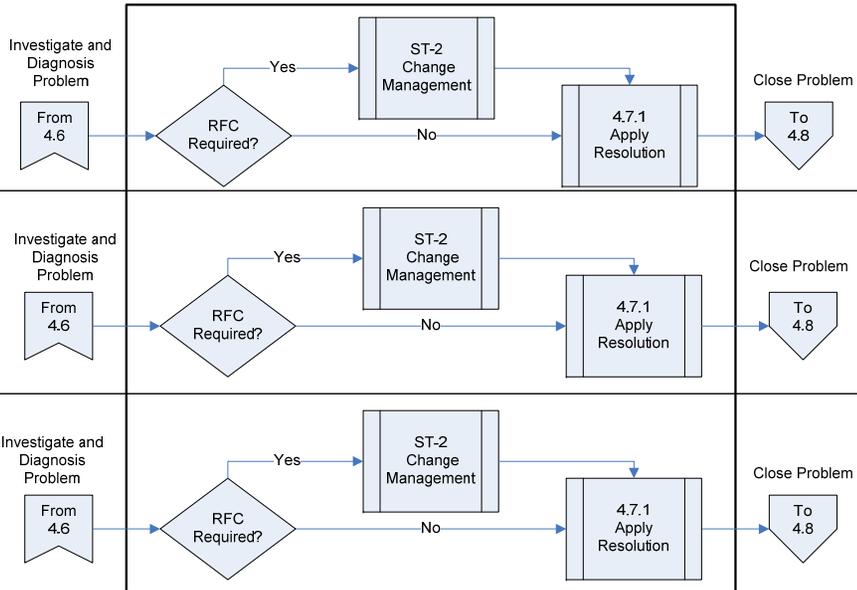
Provider – Primary Services

Provider – Support Services

(4.7) Resolve Problem:

Ideally, as soon as a solution has been found, it should be applied to resolve the problem – but in reality safeguards may be needed to ensure that this does not cause further difficulties. If any change in functionality is required this will require a Request for Change (RFC) to be raised and approved before the resolution can be applied. If the problem is very serious and an urgent fix is needed for business reasons, then an Emergency RFC should be handled by the Change Advisory Board Emergency Committee (CAB/EC) to facilitate this urgent action. Otherwise, the RFC should follow the established Change Management process for that type of change – and the resolution should be applied only when the change has been approved and scheduled for release. In the meantime, the KEDB should be used to help resolve quickly any further occurrences of the incidents/problems that occur.

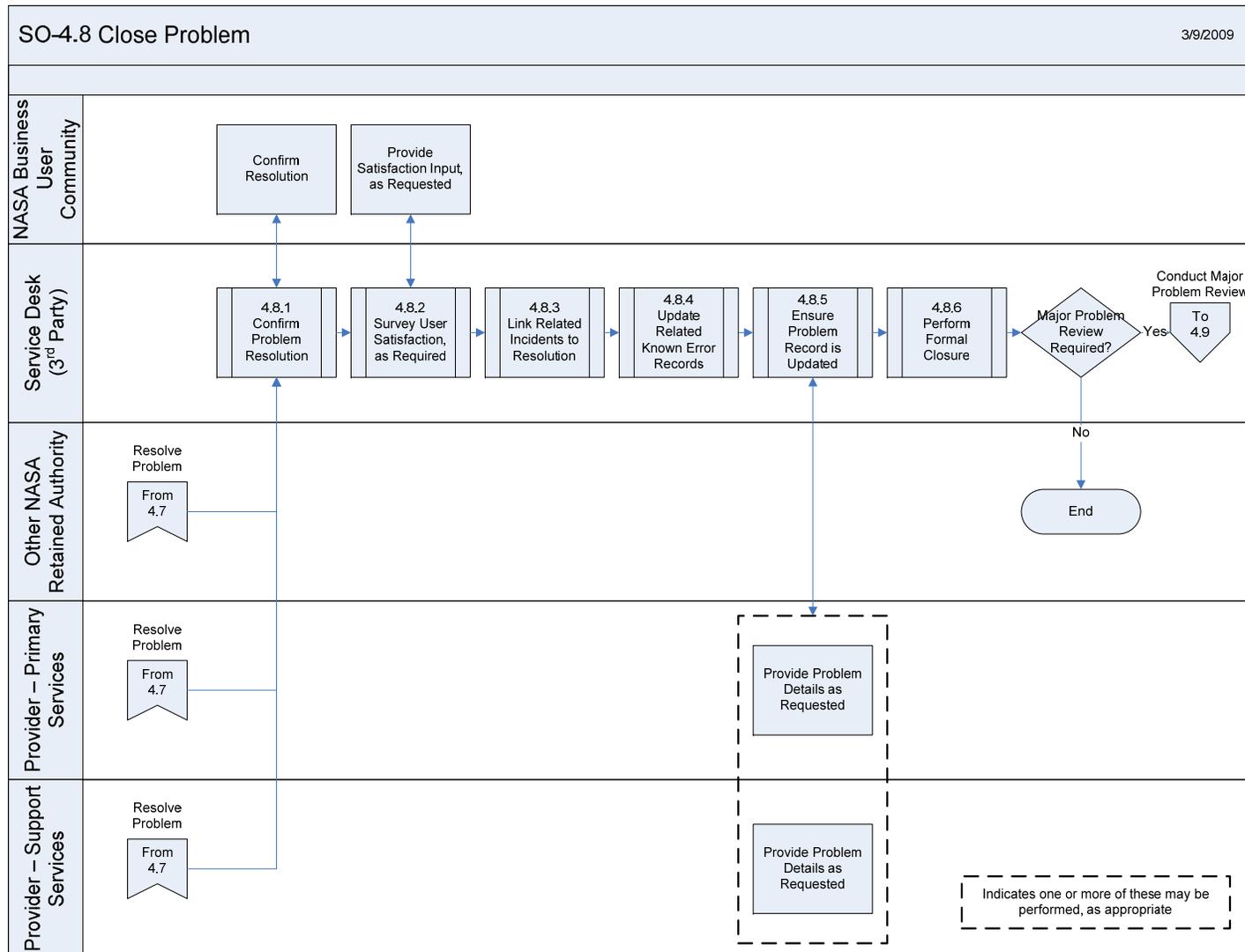
Note: There may be some problems for which a Business Case for resolution cannot be justified (e.g., where the impact is limited but the cost of resolution would be extremely high). In such cases a decision may be taken to leave the Problem Record open but to use a workaround description in the Known Error Record to detect and resolve any recurrences quickly. Care should be taken to use the appropriate code to flag the open Problem Record so that it does not count against the performance of the team performing the process and so that unauthorized rework not take place.



Indicates one or more of these may be performed, as appropriate

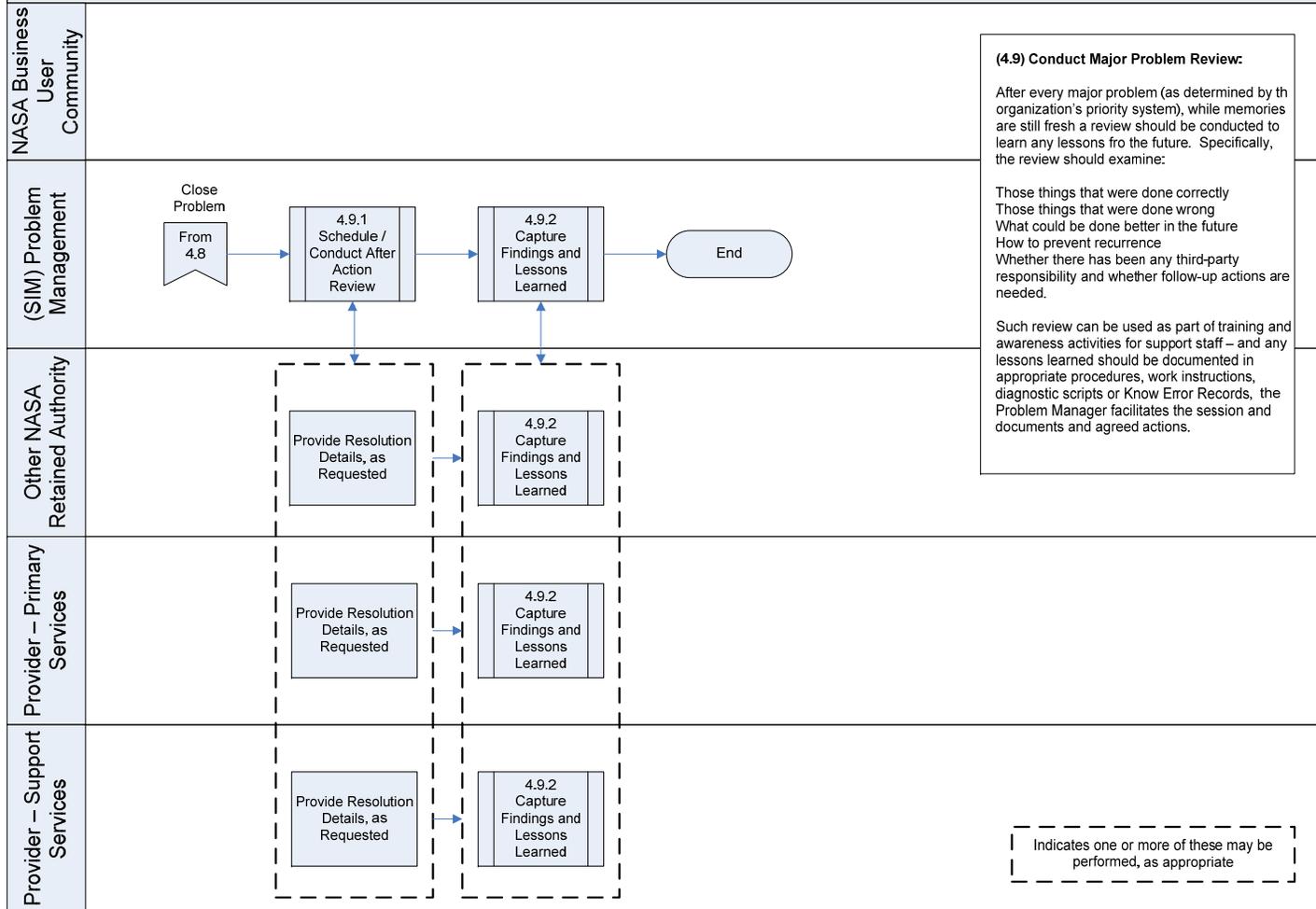
SO-4.8 Close Problem

3/9/2009



SO-4.9 Conduct Major Problem Review

3/9/2009



IT Problem Management Roles and Responsibilities

A number of roles and responsibilities have been identified as essential to the IT problem management process. The purpose of this section is to define those functional roles and responsibilities necessary for effective IT problem management, including but not limited to, **NASA's** staff, management, partners, providers, and contractors, regardless of physical location, involved in identifying and supporting IT problems to **NASA's** IT environment.

Roles	Responsibilities
(SIM) Problem Management Process Owner	<ul style="list-style-type: none"> • Responsible for the documentation, modification, and update of all IT problem management process documentation • Responsible for assuring that the problem process meets organizational performance expectations • Ensures that individuals/groups adhere to the problem process • Accountable for the efficiency, effectiveness, and accountability of the process • Responsible for problem management performance reporting
Center IT Problem Coordinator	<ul style="list-style-type: none"> • Participates in weekly Change Advisory Board (CAB) meetings • Accountable for management of problem ticket completeness, timeliness of responses and follow-up, and integration with other processes (e.g., change management) • Monitors the effectiveness of problem management and makes recommendations for improving it • Manages problem support staff • Allocates resources for problem support effort • Assists with problem management reporting and documentation • Assists with problem ticket completeness, timeliness of responses and follow-up, and integration with other processes (e.g., change management)
Problem Support	<ul style="list-style-type: none"> • May help with entry of problem ticket • May participate in 1st, 2nd, and/or 3rd level problem support • Identifies problems (e.g., via monitoring, by analyzing incident data, etc.) • Investigates problems, according to impact, through to resolution or error identification • Raises requests for change to clear errors • Monitors progress on the resolution of known errors • Advises incident management staff on the best available work-arounds for incidents related to unresolved problems/known errors • Assists with the handling of major incidents and identification of root causes. • Identifies trends and potential problem sources (by reviewing incident and problem analysis) • May enter requests for change to prevent the recurrence of problems

Identification of Problems and Logging of Problem Tickets

An incident will be recognized as a problem when:

- a known error is not found during the initial stage of incident support and classification
- analysis of incident data reveals recurring incidents
- analysis of the IT infrastructure indicates a problem that could potentially lead to incidents

Problems may be identified by: any person (including staff, management, partners, providers, and contractors, regardless of physical location) responsible for supporting, or receiving support from, NASA's IT environment.

IT problem management tickets are to be filled out for any/all problems reported, concerning **NASA's** IT environment.

IT problem tickets are expected to be filed prior to any support being provided.

Sample Problem Ticket

Submission date/time	
Submission #	
Problem information	
Problem classification	
Priority	
Effectuated parties/locations	
Possible causes of problem	
Hand-offs to other processes (e.g., change request form)	
Responsible support personnel	
Estimated resolution time	
Problem status – logged, assessed, rejected, accepted, on hold	

IT Problem Support Timing

IT problem management support may be requested at any time.

Problem management support timing will be addressed according to the problem manage support and service levels defined in the below table.

Level	Definition	Response Timing	Resolution Timing
Level 1	High business visibility/impact	1 hour	4-8 hours
Level 2	Moderate business visibility/impact	4 hours	24 hours

Level 3	Low business visibility/impact	8 hours	72 hours
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IT Problem Management Performance Measures

NASA will measure and maintain the performance of its IT problem management process with the following performance measures:

- # of problems per period (week)
- Mean time to resolve problems
- Avg. time to resolve problems
- % of level 1 problems (simple)
- % of level 2 problems (requires moderate tech expertise)
- % of level 3 problems (requires extensive tech expertise)
- # of level 1 support staff
- # of level 2 support staff
- # of level 3 support staff
- Avg. queue time
- Avg. call answer times
- Avg. call abandonment
- Avg. first call resolution rates# of Problem/problem requests relating to one config item
- Gross number of Problems and trends
- # / % of Problems executed outside normal Problem process
- Problem backlogs, broken down by configuration items
- Cost per Problem
- #/% of Problem requests generated by the business
- Ratio of accepted to rejected Problem requests
- % of emergency fixes for which the Problem process was not applied retroactively
- Mean time to Response
- Mean time to Restore
- Support staff per 1,000 supported users
- % Problems resulting from change
- Customer satisfaction rating (1=low, 5=high)
- # of repeat inquiries
- Average cost per call
- # of escalations

IT Problem Management - Key Integration Points

Effective IT problem management requires significant integration between those technology and business communities that support, or request support of, **NASA's** IT environment. As such, the IT Problem management process should include, but not be limited to, the following process integration points:

- Inputs

- Incident Management
- Tech Issues:
- Project Management
- Applications Development
- Architecture
- Operations
- Business Relationship Management
- Configuration Management (known errors)
- Outputs
 - Change Management
 - Configuration Management (known errors)

Document Maintenance

The Service Integration Management office and associated parties will review the IT problem management process document annually for detail and refinement opportunities.

Additional reviews may be conducted as needed to amend policies to reflect changes in **NASA's** IT and business strategies, service offerings, and changing conditions in legal, regulatory, and market conditions. Suggestions or feedback regarding the IT problem management process document may be submitted to the document owner, who will formalize and submit draft document revisions for review and approval by the document review board. Once approved, the document owner will update and distribute the document.