SSP 30524

Problem Reporting and Corrective Action Data System Requirements Definition Document for the International Space Station Program

International Space Station Program

Revision E
July 6, 1998

Type 1

National Aeronautics and Space Administration
International Space Station Program
Johnson Space Center
Houston, Texas
Contract No. NAS15-10000

SSP 30524   July 6, 1998

REVISION AND HISTORY PAGE

REV	DESCRIPTION	PUB DATE
-	BASELINE ISSUE (REFERENCE SSCBD BB000673 EFF. 01-16-91)	01-15-91
A	REVISION A (REFERENCE SSCBD BB000868BR1 EFF. 11-21-91)	11-91
	CHANGE 1 (REFERENCE SSCBD BB000868C EFF. 03-31-92)	06-92
B	REVISION B (REFERENCE SSCBD BB000868D EFF. 07-30-92)	11-92
	CHANGE 1 (REFERENCE SSCBD BB000868E EFF. 07-30-92)	12-92
	CHANGE 2 (REFERENCE SSCBD BB000868F EFF. 01-26-93)	02-93
C	REVISION C (REFERENCE SSCBD BB000868G EFF. 09-28-93 AND BB003681 EFF. 05-28-93)	10-93
D	REVISION D (REFERENCE SSCD 000217, EFF.02-25-96 (INITIAL RELEASE ON ISS PROGRAM)	05-02-96
E	REVISION E (REFERENCE PER SSCD 001612, EFF. 09-28-98)	10-02-98

PREFACE

This document, the Problem Reporting and Corrective Action (PRACA) Data System (PDS) Requirements Definition Document (RDD), was prepared in support of DRD AP-01, Integrated Applications. SSP 30223, PRACA System Requirements for the International Space Station (ISS) assigns responsibilities to the ISS organizational elements for implementing, operating, and managing the ISS PRACA System for the ISS. The goal of the ISS PDS is to provide a centralized data processing facility for ISS PRACA activities.

This document contains an introduction and paragraphs on user requirements for the development, implementation, and maintenance of the ISS PDS as required for the ISS.

The International Partners shall have a system which meets or exceeds the requirements of their respective Joint Program Definitions and Requirements Document, particularly SSP 30524, Revision C.

The contents of this document are intended to be consistent with the tasks and products to be prepared by NASA Centers and ISS participants as specified in SSP 41000 International Space Station Program System Specification. The PDS Requirements Definition Document shall be implemented on all new ISS contractual and internal activities, and shall be included in any existing contracts through contract changes.

The contents of this document are intended to be consistent with the tasks and products to be prepared by International Space Station Program participants. The Problem Reporting and Corrective Action (PRACA) Data System (PDS) Requirements Definition Document (RDD) shall be implemented on all new ISS contractual and internal activities and shall be included in any existing contracts through contract changes. This document is under the control of the International Space Station Safety and Mission Assurance Panel, and any changes or revisions will be approved by the NASA and Prime Safety & Mission Assurance (S&MA) Managers (or delegated representatives).

/s/ Jerry Holsomback for

NASA S&MA Manager,
International Space Station

INTERNATIONAL SPACE STATION PROGRAM
PROBLEM REPORTING AND CORRECTIVE ACTION (PRACA) DATA SYSTEM (PDS)
REQUIREMENTS DEFINITION DOCUMENT (RDD) FOR THE SPACE
STATION PROGRAM
July 6, 1998

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LIST OF CHANGES

July 6, 1998

All changes to paragraphs, tables, and figures in this document are shown below:

ENTRY DATE   **CHANGE**   **PARAGRAPH(S)**

July 6, 1998   E   All

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1. INTRODUCTION

1.1 PURPOSE

The purpose of this document is to define the requirements for the International Space Station (ISS) Problem Reporting and Corrective Action (PRACA) Data System (ISS PDS). SSP 30223, <u>Problem Reporting and Corrective Action System Requirements for the Space Station Program</u>, assigns responsibilities to the ISS organizational elements for implementing, operating, and managing the ISS PRACA System for the ISS.

The goal of the ISS PDS is to provide a centralized data processing facility for ISS PRACA activities. The primary purpose is to provide a single repository for all ISS reportable problems as specified in SSP 30223.

The objectives of the system are:
—   To provide an aggregate information system to support the identification, reporting, analyzing, resolution, recurrence control, and documentation of ISS hardware reportable problems.
—   To provide the significant failure history necessary to support on-orbit sustaining activities including in-flight anomaly (IFA) resolution and programmatic trend analyses.

The ISS PDS is the Information System (IS) application designated to provide the automated capabilities needed to meet these objectives. This ISS PDS Requirements Definition Document (RDD) is the controlling document for the ISS PDS functional and data requirements.

The ISS PDS will be used as a tool that will significantly aid in the systematic review of historical reportable problem events, integrated with current problem report event data to effect positive improvements in the safety, reliability, and quality of the ISS.

1.2 SCOPE

This document defines the requirements for the development, implementation, and maintenance of the ISS PDS as specified in SSP 30223, Revision G, PRACA system requirements for the ISS.

The ISS PDS is a centralized, closed-loop system to support reporting, analyzing, tracking, and closure of each reportable problem in ISS PRACA that affects ISS components, systems, elements, etc. The ISS PDS shall also reference and/or link to data supporting reportable problems. It is the intent of the ISS PRACA user community to provide data to the PDS from product qualification testing through on-orbit anomalies.

The requirements as specified in SSP 30223 apply to all International Space Station Program Office (ISSPO) participants. SSP 30223 states that the ISS PDS is the official repository for ISSPO data relating to problem reporting and corrective action for reportable problems detected in ISS hardware. The ISS PDS will provide information services to all authorized ISS PRACA system users. This system, including interfaces to other related information systems, will be implemented and operated as an IS application. The requirements as they are presented in this document apply to the design and development of the ISS PDS. This document is not intended to supersede reporting requirements as specified in SSP 30223, but rather to define a means for the electronic processing of that information.

The PDS provides managed data areas such that problem reports are under the privacy and control of the responsible organization until the associated problem data has been analyzed, reviewed, updated and released to the public area. Controlled data areas are identified in Appendix B, Table 5-1.

The primary user community of the PRACA application is the Space Station Safety and Mission Assurance (S&MA) staff who submit, status and process problem reports. "Read only" data of problem reports released to the public region are available to any ISS community user.

1.2.1 IS Services

Services shall be provided by IS to make the ISS PDS accessible to all authorized users. These IS services shall include database applications, hardware, communications, training, help desk, security, configuration control, data archive, and data entry mechanisms.

Training, along with other support services, including a user's manual, help desk, and on-line help, shall be provided by the IS organization. Security and access controls shall be provided for the ISS PDS. Configuration control shall be provided by IS to ensure data integrity and consistency throughout the time-phased life cycle of the ISS PDS development and operations.

IS shall design and implement the processes defined and required for the ISS PDS as specified in this RDD. IS shall develop data base applications to support PRACA ISS wide services.

1.3 APPLICABILITY

This document applies to NASA, the ISS Prime Contractor and sites involved in the manufacture, assembly, handling, use, testing or repair of any ISS or GFE component or End Item. It is specifically applicable to the ISS Prime Contractor and subcontractors and all GFE hardware contractors. Problem Reporting for the International Partners/ Participants is defined in the NASA/ International Partners/ Participants Bilateral Safety and Mission Assurance Requirements documents and NASA/ International Partners/ Participants Bilateral Data Exchange Agreements, Lists and Schedules documents.

1.4 APPLICATION OWNER

The PRACA application is the primary responsibility of the ISSPO S&MA (OE) community.

1.5 ISS PDS USER DEFINITIONS

The order of the users in this section defines the hierarchy of user roles. Each higher level assumes the privileges of the lower levels (i.e., the ISS PDS Power User has the same privileges as the ISS PDS Sign-off User and ISS PDS General User). Throughout the document when a user designation is given, it will be the lowest level that can perform the requirement.

1.5.1 ISS PDS GENERAL USER

The ISS PDS General User shall be able to initiate a Problem Identification Report, maneuver through the PDS public screens to view problem report information, and perform simple queries to extract data from public reports. This category is restricted to ISS Program personnel.

1.5.2 ISS PDS SIGN-OFF USER

The ISS PDS Sign-off User shall be provided electronic signature access for Problem Reports (PRs). This signature capability must be authorized through an ISS PDS Local Administrator. This category is restricted to ISS Program personnel.

1.5.3 ISS PDS POWER USER

The ISS PDS Power User shall be able to perform query and edit functions on public PRs required to support the Problem Resolution Team (PRT) process. This category of user is restricted to ISS S&MA organizations.

1.5.4 ISS PDS LOCAL ADMINISTRATOR

The ISS PDS Local Administrator shall be able to perform query and edit functions on private PRs, assign problem resolution team members, create subsystem notification lists of new problem reports, release private problem reports to public, recommend and accept re-assignment of problem reports between Responsible Organizations, and assign personnel PR Close-out signature and ISS PDS Power User authority at their local organization. The ISS PDS Local Administrator shall be the primary point of contact for all questions concerning the ISS PDS at their local organization. This category of user is restricted to ISS QA organizations.

1.5.5 ISS PDS DATA ADMINISTRATOR

The ISS PDS Data Administrator shall have the capability to modify lookup lists of values. These lists include the organizations, status codes, etc. This role will be able to do all of the functions allowed by a ISS PDS Local Administrator, but do them across all organizations. This role will interface with other applications to maintain shared data. For example, VMDB lookup values. This category of user is restricted to ISS QA organizations.

2. DOCUMENTS

2.1 APPLICABLE DOCUMENTS

The following documents of the date and issue shown include specifications, models, standards, guidelines, handbooks, and other special publications. "Current Issue" is shown in parentheses in place of the specific date and issue when the document is under International Space Station Control Board control. The status of documents identified by "Current Issue" may be determined from the International Space Station Program Baseline Activity Index and Status Report.

The documents in this paragraph are applicable to the extent specified herein. The references show where each applicable document is cited in this document.

DOCUMENT NO.	TITLE
SSP 41173 Revision A October 26, 1994	Space Station Quality Assurance Requirements
SSP 30223 Revision G February 15, 1998	Problem Reporting and Corrective Action (PRACA) for the Space Station Program.
SSP 3030 Current Issue	Space Station Freedom Program Technical Data and Goods Transfer Control Plan, Reference Paragraphs 3.8.4 and 4.1.6
SSP 30000, Section 6 Current Issue	Space Station Program Definition and Requirements: Resource Allocation, Reference Appendix D

3. REQUIREMENTS

This chapter documents ISS PDS requirements from the perspective of the system users. Consolidated user views of the activities, information needs, and environments associated with the intended ISS PDS are provided.

3.1 PRACA User Scenario

Figure 3-1 shows a user scenario for PRs entered into the ISS PDS.
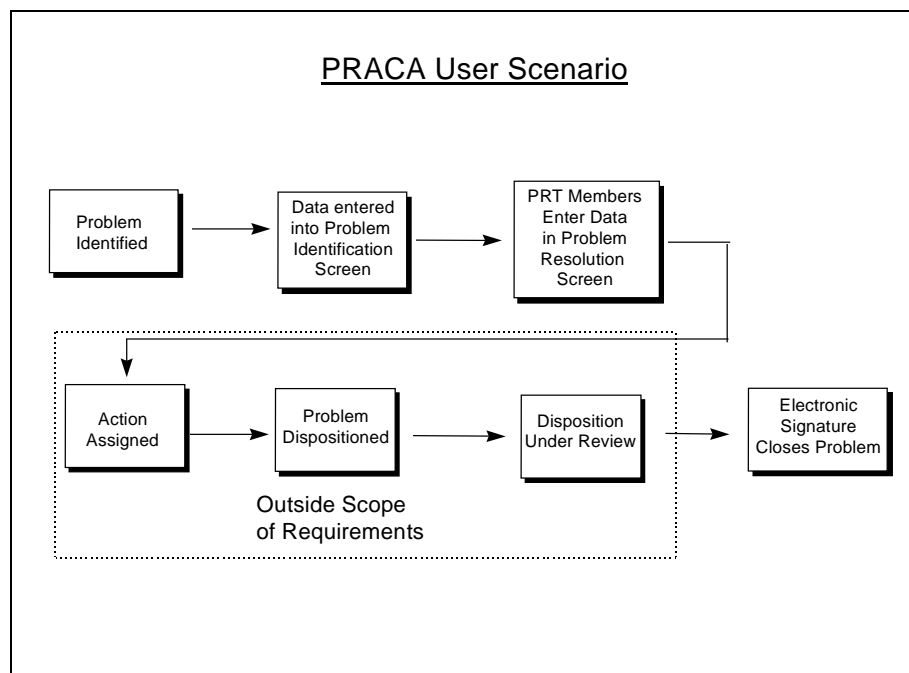
Figure 3-1 PRACA User Scenario Diagram

3.2 PRACA Data Flow

Figure 3-2 shows the Data Flow Diagram (DFD) which defines the overall scope, from the user community perspective, of the processes to be supported by the ISS PDS.
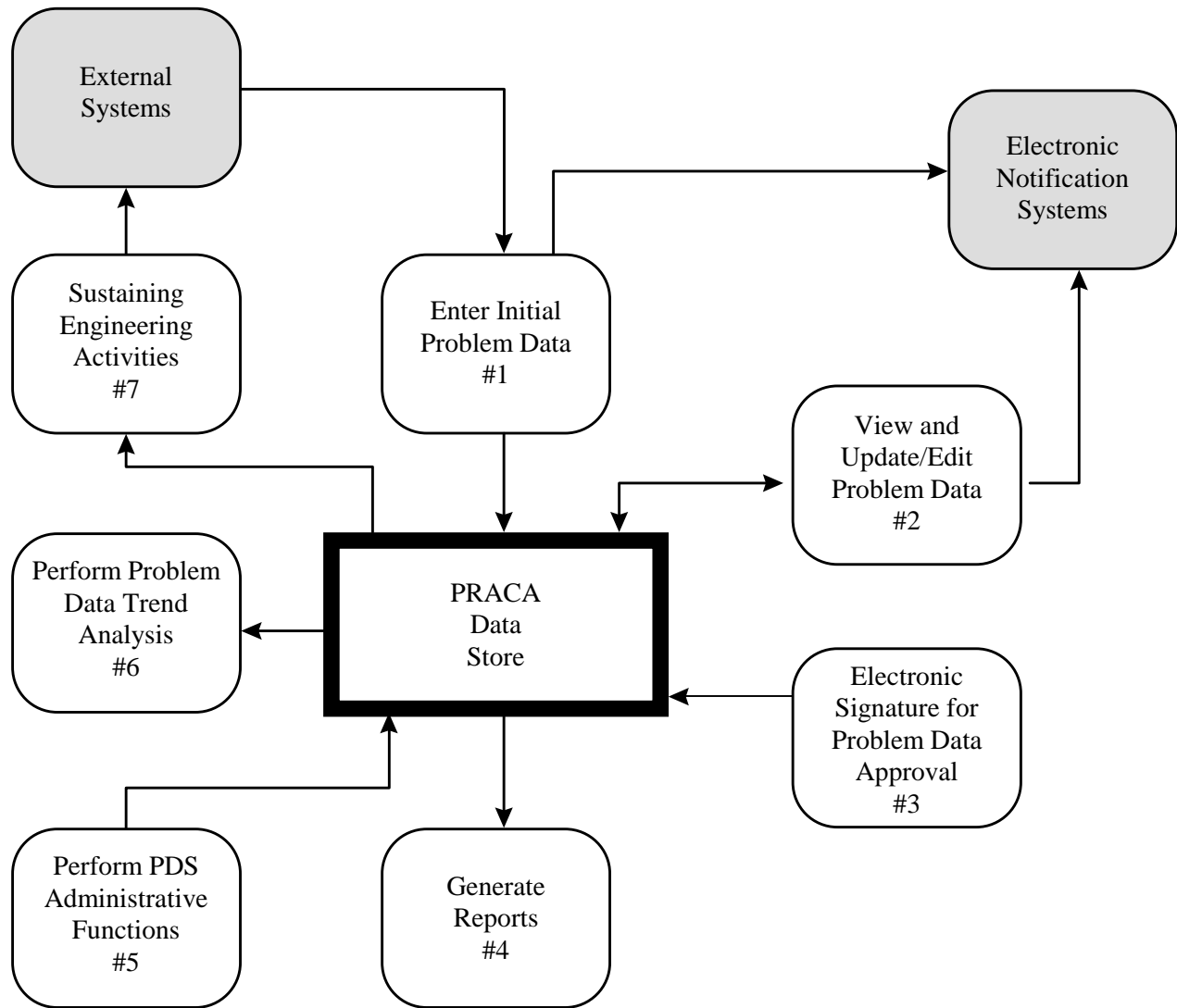
Figure 3-2 PRACA Data Flow Diagram

3.2.1 PROCESS #1: ENTER INITIAL PROBLEM DATA

The original entry of PRACA data into the ISS PDS may be performed by any ISS PDS General User. The data may either be entered interactively through the ISS Problem Identification screen, or copied from existing PRs to new PRs. The system shall copy the initiating organization to the responsible organization, provide the capability to review data prior to release for public viewing, and release the PR from the private to public domain. The data may be entered electronically via file transfer by the ISS PDS Local Administrators.

3.2.2 PROCESS #2: VIEW AND UPDATE/EDIT PROBLEM DATA

The system shall provide authorized users the capability to view and edit PR data through data entry screens. PRs will not be deleted from the system, only closed with the appropriate status.

3.2.3 PROCESS #3: ELECTRONIC SIGNATURE FOR PROBLEM DATA APPROVAL

The appropriate organization/problem resolution team will determine the resolution(s) for the PR. The ISS PDS shall provide the capability to track and capture the required approvals.

3.2.4 PROCESS #4: GENERATE REPORTS

The ISS PDS shall have the capability to generate standard and ad hoc reports. These reports shall include summary reports, data and code queries, and metrics. Reports shall be generated in a format that can be saved in a file on an individuals workstation, a hardcopy printout, or to a screen display supported by standard NASA software loads. The format of the report will be that which is most appropriate for the source. Reports will be either postscript, ASCII or PDF with the user selecting the format.

3.2.5 PROCESS #5: PERFORM ISS PDS ADMINISTRATOR FUNCTIONS

ISS PDS Administrators shall perform the basic administration functions necessary to support the PRACA system via the ISS PDS. The system shall allow the ISS PDS Administrator the capability to assign problem resolution team members, create subsystem notification lists, update lookup lists, release private PRs to public, reassign a PR, and modify problem status.

3.2.6 PROCESS #6: PERFORM TREND ANALYSIS

The ISS PDS shall have the capability to perform system generated trend analyses on PRACA data to identify trends and adverse conditions.

3.2.7 PROCESS #7: SUSTAINING ENGINEERING ACTIVITIES

The ISS PDS shall have the capability to interface with external IS applications. The ISS PDS shall provide PR data to support sustaining engineering activities.

3.3   STATEMENT OF CONCEPTUAL REQUIREMENTS

This section of the RDD describes, in high level terms, the user expectations of what services the ISS PDS will provide.

3.3.1   PROCESS REQUIREMENTS

3.3.1.1   Enter Initial Problem Data

3.3.1.1.1   The ISS PDS shall provide the capability to capture all of the data elements of Appendix C to describe a reportable ISS PRACA problem.

3.3.1.1.2   The ISS PDS shall provide the capability for an ISS PDS General User to enter a new PR into the ISS PDS through data entry screens.

3.3.1.1.3   The ISS PDS shall verify that an ISS PDS General User has entered all required data before the PR is stored in the database. This private PR is stored without a problem number.

3.3.1.1.4   The ISS PDS shall automatically generate a unique local problem report number for PRs with no unique local number entered. These numbers shall be prefaced with the string 'ISSPRACA'.

3.3.1.1.5   The responsible organization shall be the initiating organization until the PR is transferred to, and accepted by, the receiving organization.

3.3.1.1.6   The ISS PDS shall provide an ISS PDS Local Administrator the capability to create a distribution list of users, identified by E-mail addresses, for a subsystem. The distribution list of users will be those users with Sign-off privilege or higher. The list will be a list of values so an ISS PDS Local Administrator does not have to type the mail addresses.

3.3.1.1.7   The ISS PDS shall automatically notify all ISS PDS Local Administrators of the responsible organization of new private PRs.

3.3.1.1.8   The ISS PDS shall automatically notify all ISS PDS Data Administrators of any new private PRs.

3.3.1.1.9   The ISS PDS shall automatically generate a unique problem number for each private PR accepted by an ISS PDS Local Administrator. These numbers must be sequential and PRs cannot be deleted.

3.3.1.1.10   The ISS PDS shall automatically send E-mail notification of a new public PR to the personnel identified in the subsystem distribution list associated with the PR's subsystem.

3.3.1.1.11   The ISS PDS shall provide the capability for the responsible organization to determine that a new PR has been entered into the ISS PDS and is available for review and electronic assignment of responsibility.

3.3.1.1.12   The ISS PDS shall automatically fill in identified PR data fields by using default or system generated values or from data tables. These fields are identified in Appendix C.

3.3.1.1.13   The ISS PDS shall provide an ISS PDS General User the capability to copy selected fields of an existing public PR into a new PR. The user will indicate a copy function is taking place, select the fields to be copied, identify if this is a linked PR or not, and a new private PR will be created. The fields that can be copied are identified in Appendix C.

3.3.1.1.14   The ISS PDS shall provide an ISS PDS General User the capability to link PRs to other PRs. The linked PRs can have only one parent PR with many linked children and a linked child cannot be a parent to other PRs.

3.3.1.1.15   The ISS PDS shall provide the following rules for copying a linked PR. If the source PR is the child of another PR, then the parent's PR number will be copied to the new target PR linked field. If the source PR is not the child of another PR, then the source PR number will be copied to the new target PR linked field.

3.3.1.1.16   The ISS PDS shall verify data interdependencies and validation checks specified in Appendix C. Validation failures shall be displayed to the user.

3.3.1.1.17   Upon electronic file loading of data, data interdependencies and validation checks, specified in Appendix C, shall be made on the uploaded data. Validation failures shall be displayed to the user.

3.3.1.2   View and Update/Edit Problem Data Process

3.3.1.2.1   The ISS PDS shall provide the capability for an ISS PDS Local Administrator of the responsible organization to view and update a private PR that is assigned to the organization, except those fields identified in Appendix C as not editable.

3.3.1.2.2   The ISS PDS shall allow an ISS PDS Power User the capability to correct previously entered data until the problem approval cycle has begun. Those fields that cannot be modified are identified in Appendix C.

3.3.1.2.3   The ISS PDS shall allow an ISS PDS Power User the capability to send the contents of a PR by E-mail to any E-mail entered address. This is not a requirement to build an email system, only to place the data from a PR into the body of a mail message and send to a distribution list.

3.3.1.2.4   The ISS PDS shall provide the capability for an ISS PDS Local Administrator to release a PR for general viewing. The ISS PDS Local Administrator can only release those private PRs that have been assigned to their local organization.

3.3.1.2.5   The ISS PDS shall provide the capability for an ISS PDS Power User to access PRs that are "linked" (i.e., identified by a common relationship) together.

3.3.1.2.6   The ISS PDS shall provide the capability for an ISS PDS Power User to search the data base by field. Wildcards shall be permitted to satisfy a search request.

3.3.1.2.7   The ISS PDS shall display items such that only those fields which the user can update are presented in a modifiable format.

3.3.1.2.8   The ISS PDS shall provide a link to the PALS system using a field described in Appendix C.

3.3.1.2.9   The ISS PDS shall provide an ISS PDS Local Administrator the capability to upload new data from a file into a predetermined set of data fields of an ISS PRACA PR report. This data shall be marked private until moved to public and assigned a number. The interchange file format and procedures are described in the ISS PDS User's Guide and ICD documents that will be written in the design process.

3.3.1.2.10   The ISS PDS shall provide an ISS PDS Local Administrator the capability to transfer ownership of a PR from one responsible organization to another. This transfer shall be initiated by the identified responsible organization and accepted by a different organization prior to transfer. Upon transfer, accept or reject, the ISS PDS shall electronically notify the ISS PDS Local Administrators in the accepting and transferring organizations.

3.3.1.2.11   The ISS PDS shall provide an ISS PDS Local Administrator the capability to create PRTs and uniquely name these teams within an organization.

3.3.1.2.12   The ISS PDS shall provide an ISS PDS Local Administrator the capability to assign members to an existing PRT. These members can be typed in manually or can come from the list of current ISS PDS Power Users or higher. Manual entries do not need to be PRACA users.

3.3.1.2.13 The ISS PDS shall provide an ISS PDS Local Administrator the capability of assigning PRs to an existing PRT. A PR can be assigned to only one PRT. A PRT can be assigned many PRs.

3.3.1.3 Electronic Signature For Problem Data Approval Process

3.3.1.3.1 The ISS PDS shall provide ISS PDS Power Users at the responsible organization the capability of changing the problem status of a PR.

3.3.1.3.2 The ISS PDS shall allow an ISS PDS Power User to close a PR. If PR is parent, child(ren) PRs will be closed. If PR is child, must close Parent PR to close child(ren).

3.3.1.3.3 The ISS PDS shall provide an ISS PDS Local Administrator at the responsible organization the capability to assign electronic close-out signature authority to designated ISS PDS Sign-off Users.

3.3.1.3.4 The ISS PDS shall provide the capability for any signature authorized ISS PDS Sign-off User at the responsible organization to approve or disapprove a problem resolution by means of an electronic signature.

3.3.1.3.5 The ISS PDS shall automatically suspend update authority to the public version of the PR during the approval cycle. The approval cycle begins with the first closure signature entry. A disapproval in any signature field shall end the approval cycle and require the removal of any previous signatures, by the signatories, in order to modify the PR to achieve an approval consensus.

3.3.1.3.6 The ISS PDS shall check for 'Disposition' status before allowing access to the Electronic Signature Page for a specified PR.

3.3.1.3.7 The ISS PDS shall allow 'Open' status PRs to be changed to 'Disposition'.

3.3.1.3.8 The ISS PDS shall allow the 'Disposition' status to be changed to a 'Closed' status when the appropriate number of electronic signatures are entered and approved.

3.3.1.3.9 The ISS PDS shall require only 9 electronic signatures for level 1 PRs.

3.3.1.3.10 The ISS PDS shall require only 4 electronic signatures for level 2 PRs.

3.3.1.3.11 The ISS PDS shall require one and only one electronic signature for 'Closed - Not a Reportable' Problem.

3.3.1.3.12 The ISS PDS shall not allow a 'Closed' or 'Closed - Not a Reportable Problem' PR to be modified.

3.3.1.3.13 The ISS PDS shall allow the Electronic signatures of an 'Interim Closure' PR to be removed and then allow the status to be changed to 'Open'. This will allow the PR to be edited.

3.3.1.3.14 The ISS PDS shall allow changes to Parent PR's status to automatically be implemented in the child(ren) PRs.

3.3.1.3.15 The ISS PDS shall allow closeout signatures input to Parent PRs to automatically flow to child(ren) PRs.

3.3.1.3.16 When Parent PR with a status of "CI" is re-opened, child(ren) PR(s) will revert to "Open" status.

3.3.1.3.17 Parent PRs shall never have a status of "Closed-Linked".

3.3.1.4   Generate Reports Process

3.3.1.4.1   The ISS PDS shall have pagination and page headers for each standard report.

3.3.1.4.2   The ISS PDS shall provide the capability for a ISS PDS General User to run reports for individual public PRs.

3.3.1.4.3   The ISS PDS shall provide the capability to print the reports identified in Appendix F.

3.3.1.4.4   ISS PDS General Users shall have the capability to create ad hoc reports on PRACA data, specifying the fields to be included. The fields which can be queried upon are specified in Appendix C.

3.3.1.4.5   The ISS PDS shall provide the capability to display reports on the terminal screen, print a hardcopy, or save them in a file on their local system.

3.3.1.4.6   All ISS PDS standard reports to be printed shall be compatible in size with available Information Systems printers.

3.3.1.4.7   The ISS PDS shall allow the users to specify the subtitle of a standard report.

3.3.1.4.8   The ISS PDS shall provide the capability for ISS PDS users to specify the printer on which a report will be produced with printer locations identified by a list from which the user may make a selection.

3.3.1.4.9   The ISS PDS shall have all coded data fields printed out with text equivalents per Appendix B.

3.3.1.4.10   The ISS PDS shall provide the capability to sort existing problem data based on a user definable set of data fields and sort criteria. The sorting fields are defined in Appendix C. The sorting will be available for the ad-hoc report capability.

3.3.1.4.11   The ISS PDS shall provide the capability for the users to generate reports for ad-hoc and all problems for various levels of detail. The level of detail shall be selectable by the user. The fields that are used in each level are referenced in Appendix C. These levels are: summary, middle, and full.

3.3.1.4.12   Private PRs will be available for the ISS PDS Local Administrators of the responsible organization.

3.3.1.5   Perform PDS Administrative Functions Process

3.3.1.5.1   The ISS PDS shall provide the ISS PDS Data Administrator the capability to maintain a list of users and their assigned email addresses.

3.3.1.5.2   The ISS PDS shall provide the ISS PDS Local Administrator the capability to create distribution lists from the electronic mailbox addresses maintained by the ISS PDS Data Administrator.

3.3.1.5.3   The ISS PDS shall provide the capability to upload problem data from a standard file format. This function shall be limited to the ISS PDS Local Administrator. The data transfer format shall be in accordance with the specifications in Appendix D.

3.3.1.5.4   The ISS PDS shall provide the ISS PDS Local Administrator the capability to create problem resolution teams.

3.3.1.5.5   The ISS PDS shall provide the ISS PDS Local Administrator the capability to assign personnel to problem resolution teams using the electronic mailbox list administered by the ISS PDS Data Administrator.

3.3.1.5.6 The ISS PDS shall provide the ISS PDS Local Administrator the capability to create subsystem notification lists.

3.3.1.5.7 The ISS PDS shall provide the ISS PDS Local Administrator the capability to assign personnel to subsystem notification lists using the electronic mailbox list administered by the ISS PDS Data Administrator.

3.3.1.5.8 The ISS PDS shall have the capability for the ISS PDS Data Administrator to create and maintain the data in some lookup value tables in the ISS PDS. These tables are identified as: Organization Code, Test/Operation Code, Indenture Level Code, Site Location Code, Reportable Problem Code, Status Code, Failure Mode Code, Defect Code, Material Code, Cause Code, Criticality Code, Recurrence Control Code, Prevailing Condition Code, How Malfunction Code, Disposition Code. Other lookup value tables come from direct links to VMDB.

3.3.1.5.9 The ISS PDS Local Administrator shall have the capability to grant and revoke PDS privileges to users at their respective organizations.

3.3.1.5.10 The ISS PDS Local Administrator shall have the capability to maintain ISS PDS user profiles regarding data access and security. The ISS PDS Local Administrator can maintain all users within his responsible organization. The ISS PDS Data Administrator can maintain all users.

3.3.1.5.11 The ISS PDS Sign-off User or higher shall have the capability to change their password.

3.3.1.6 Perform Trend Analysis

3.3.1.6.1 TBD. Trending will be defined in a future release.

3.3.1.7 Sustaining Engineering Activities

3.3.1.7.1 The ISS PDS shall have the capability to extract failure history from the ISS PDS in support of Mission Evaluation Room (MER) operations. The fields that identify failure history are identified in Appendix C.

3.3.1.7.2 The ISS PDS shall have the capability to link to other IS applications to support MER operations. The fields that link to other systems, and the systems they link to, is defined in Appendix C.

3.3.1.7.3 The ISS PDS shall provide ad-hoc query capability of failure history (software problem reports, GFE problem reports, etc.) from other problem reporting databases in support of MER operations. The systems, and the fields within the systems, that can be linked to, are defined in Appendix D.

3.3.2 GENERAL REQUIREMENTS

3.3.2.1 PDS Access

3.3.2.1.1 The ISS PDS shall provide interactive access to Johnson Space Center (JSC) institutional network as defined in the ISS IS Plan for all authorized users.

3.3.2.1.2 Access to the ISS PDS shall be controlled by an appropriate password verification system for all roles, except the ISS PDS General User.

3.3.2.1.3 User selection of specific ISS PDS functions shall be controlled by the role assigned to a user.

3.3.2.2 Menus and Screens

3.3.2.2.1 Menus shall be the standard user-interface for selecting process options.

3.3.2.2.2 A "HELP" screen shall be provided for each input menu and screen. These help screens shall define the terms on the display and give directions for data entry and system exit.

3.3.2.2.3 The ISS PDS shall provide, on request, a selection list of possible values for a coded field.

3.3.2.3 Text Editing

3.3.2.3.1   A text editing capability shall use the functionality of the system used for the application.

3.3.2.4 Time

3.3.2.4.1   The ISS PDS shall display the system entered time stamp dates, specified in Appendix C, in the JSC reference time zone.

3.3.2.4.2   The ISS PDS shall report Chit times in the GMT reference time zone.

3.3.3 INTERFACE REQUIREMENTS

The ISS PDS shall interface with many other Information Systems and NASA (non-Information Systems) databases, to cross-reference ISS PRACA data to related information. In general, this interfacing capability shall be information sharing only, and is based on relating a data element from the ISS PDS to an entity in another database. The responsibility for establishing and maintaining these relationships will be jointly maintained between the various application owners. The interface control definitions for each application is in Appendix D.

3.3.3.1 VMDB Interface Requirements

3.3.3.1.1   There shall be an interface established between VMDB and the ISS PDS.

3.3.3.1.2   The interface with VMDB shall provide the capability to link tables from the VMDB to the ISS PDS to provide list of values for the specified fields in Appendix C. (i.e., notes as VMDB source).

3.3.3.1.3   The interface with the VMDB shall provide the capability to search on part data as specified in the ICD for VMDB in Appendix D.

3.3.3.2 ISS Program Automated Library System (PALS) Interface Requirements

3.3.3.2.1   There shall be an interface established between the ISS PALS and the ISS PDS.

3.3.3.2.2   The interface with ISS PALS shall provide the capability to link related documents to specified problem reports in the ISS PDS.

3.3.3.3 Electronic Mail Interface Requirements

3.3.3.3.1   A list of user email addresses shall be maintained for users identified as ISS PDS Sign-off Users, ISS PDS Power Users, ISS PDS Local Administrators and ISS PDS Data Administrators.

3.3.3.3.2   The capability shall be provided to transfer data from the ISS PDS to Electronic Mail to pass pre-formatted messages for processing and tracking. This shall be a user initiated request. The PRACA distribution list can be used as a list of values or any E-mail address can be entered.

3.3.3.4 Other Information Systems

3.3.3.4.1   The ISS PDS shall have the capability to interface and exchange data with other NASA and non-NASA Information Systems that are identified in Appendix D. As additional interfaces are identified , Interface Control Documents (ICD) will be created and schedules developed.

3.3.3.4.2   ISS PDS shall interface with the KSC SPDMS II PRACA Data System when the ICD is defined and schedules are established.

3.3.3.4.3 ISS PDS shall be able to interchange data with the KSC Payload Data Management System (PDMS) II. Interchange shall include uploads and downloads as defined in Appendix D.

3.3.3.4.4 ISS PDS shall be able to interchange data with the Process Control Management System (PCMS) when the ICD is defined and schedules are established.

3.3.3.4.5 ISS PDS shall interface with the JSC/GFE PRACA Data System when the ICD is defined and schedules are established.

3.3.3.4.6 ISS PDS shall interface with On-Orbit Anomaly Log when the ICD is defined and schedules are established.

3.3.3.4.7 ISS PDS shall interface with the MSFC PRACA Data System when the ICD is defined and schedules are established.

3.3.3.4.8 ISS PDS shall interface with the International Partners/Participants PRACA Data systems as defined in the Bi-lateral Agreements or other agreements when the ICD is defined and schedules are established.

3.3.3.5 Capability to View Data from Multiple Systems Requirements

3.3.3.5.1 The capability shall be provided to access other applications while retaining the session with the ISS PDS. This capability shall be available from any point in the ISS PDS. These applications do not exchange data with PDS. They provide read only capability. Refer to Appendix D for a list of applications to include on the PRACA home page.

3.4 PROCESS DECOMPOSITION MODEL

The ISS PDS Process Decomposition Diagrams provides a hierarchical view of the important functions in each of the processes identified in paragraphs 3.2 (Data Flow) and 3.3 (Conceptual Requirements). The first level of decomposition, Figure 3-3, represents the scope addressed by the ISS PDS. The second level (i.e., items 1.0, 2.0, 3.0, ...) of decomposition represents the same system processes that are identified in the Process Model. Each of these second level functions may be subdivided into third level functions.
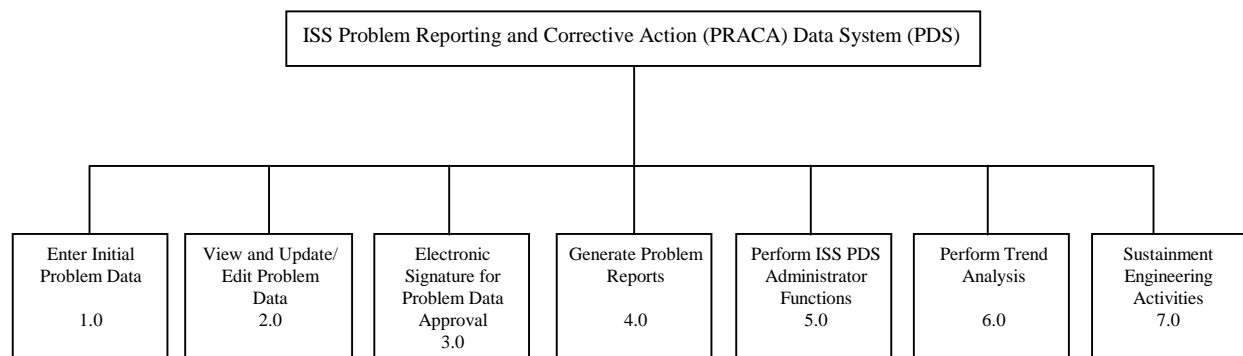
Figure 3-3 PDS Process Decomposition Diagram (PPDD)

3.4.1   PROCESS #1: ENTER INITIAL PROBLEM DATA

Figure 3-4 shows the decomposition of the Enter Initial Problem Data process. Sub-processes include:

—   Process #1.1:   Initiate Problem. The original entry of data for a PR into the ISS PDS.
—   Process #1.1.1:   Enter Data Electronically. The ISS PDS shall allow for an electronic data file to be
                         loaded.
—   Process #1.1.2:   Enter Data Manually. The ISS PDS shall allow a way for user to enter problem data one
                         field at a time.
—   Process #1.1.3:   Initiate New Problem FROM Existing Problem. The ISS PDS shall allow for an existing
                         public PR's fields to be copied to a new PR.
—   Process #1.2:   Check Data. The capability to edit data and perform verification prior to release of the
                         PR for general use.
—   Process #1.2.1:   Manual Check Data. The capability to view and edit data and perform verification, field
                         by field, prior to release of the PR for general use.
—   Process #1.2.2:   Automatic Check Data. The capability to check data with data stored in the PDS or other
                         accessible systems and require correction prior to release of the PR for general use.
—   Process #1.3:   Automatic Data Fill. The ISS PDS shall automatically fill in data fields with default
                         values shown in Appendix C.
—   Process #1.4:   Initial Notification. The system shall electronically notify designated personnel once a
                         PR has been entered.
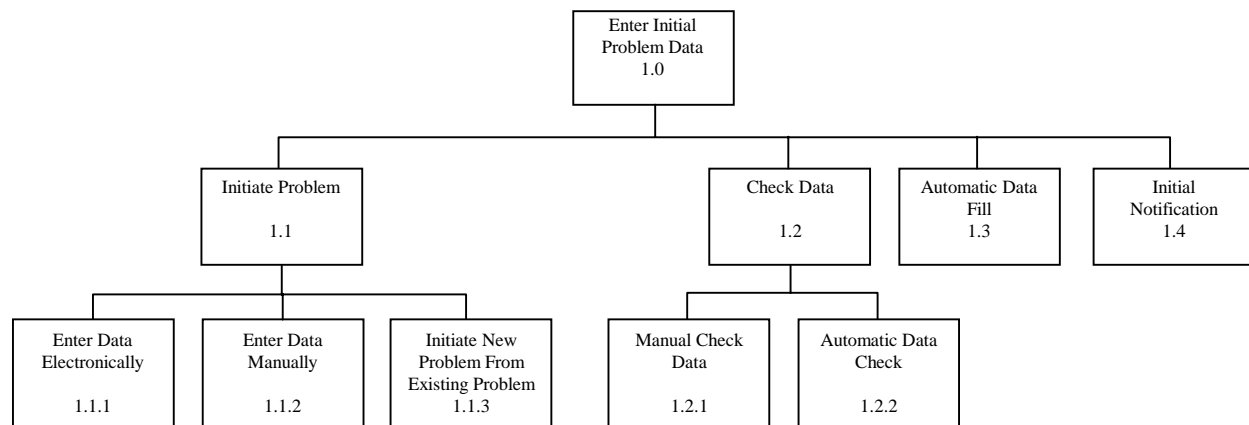
Figure 3-4 PPDD Enter Initial Problem Data Diagram

3.4.2 PROCESS #2: VIEW AND UPDATE/ EDIT PROBLEM DATA

Figure 3-5 shows the decomposition of the View and Update/ Edit Problem Data process. Sub-processes include:

— Process #2.1: Review/Release Problem Data. Each initiated PR will be maintained on-line or viewed by hardcopy for adequacy, validity and completeness by the ISS PDS Local Administrator of the responsible organization after it is entered into the ISS PDS. When the ISS PDS Local Administrator is satisfied with the PR, the PR is released to public.
— Process #2.2: Update Problem Data Fields. Update access to public PRs shall be granted for ISS PDS Power Users.
— Process #2.2.1: Edit Fields. Edit access to public PRs shall be granted for ISS PDS Power Users.
— Process #2.2.2: Enter New Data. Insert access to public PRs shall be granted for ISS PDS Power Users.
— Process #2.3: Notify Users of Problem. When the PR is released to public viewing, personnel designated as associated with the PR will be notified by electronic mail.
— Process #2.4: Assign Responsibility to Problem Data. Responsibility for PRs shall be assigned to ISS PDS users. This shall be done in the "Assigned To" field. This may also be done when personnel is assigned by PRT function.
— Process #2.5: View Problem Data. ISS PDS users can view public PRs. The ISS PDS shall provide the ability to access online supporting PR information.

Figure 3-5 PPDD View and Update/ Edit Problem Data Diagram
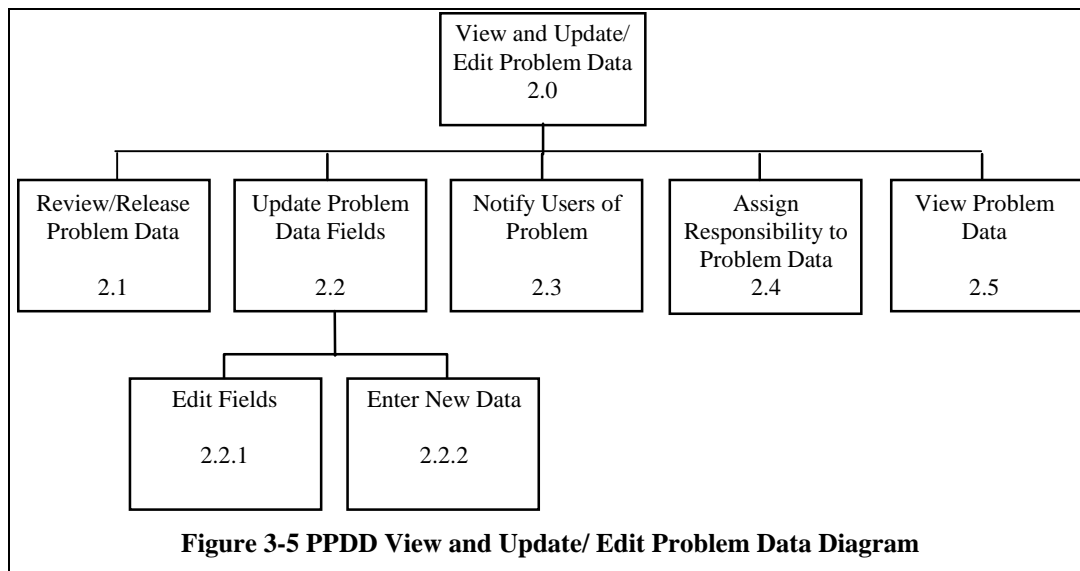
3.4.3 PROCESS # 3: ELECTRONIC SIGNATURE FOR PROBLEM DATA APPROVAL

Figure 3-6 shows the decomposition of the electronic signature for PR data approval process. Sub-processes include:

— Process #3.1: Enter/Update Electronic Signature. The ISS PDS shall provide the capability to enter & update electronic signatures for PRs. Level 1 PRs require 9 signatures. Level 2 PRs require 4 signatures. Not-Reportable PRs require one signature, regardless of level.

— Process #3.2 View Signature Approvals. The ISS PDS shall provide the capability to view electronic signatures that have been input to the system.

— Process #3.3 Lock Problem Report. The ISS PDS shall automatically lock the PR once an electronic signature has been input to the system.

— Process #3.4 Unlock Problem Report. The ISS PDS shall automatically unlock the PR once all electronic signatures have been removed from the system.
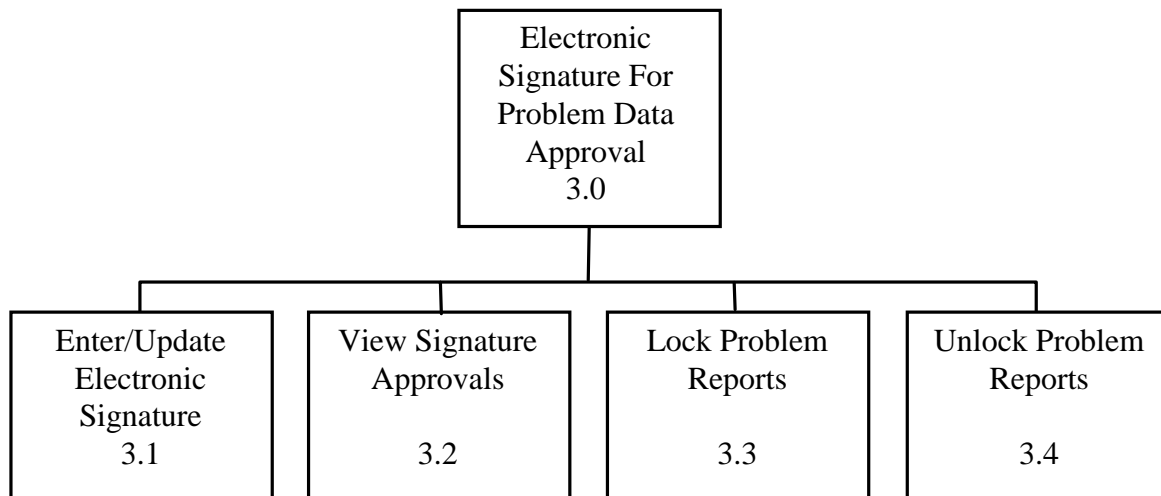
Figure 3-6 PPDD Electronic Signature for Problem Data Approval Diagram

3.4.4 PROCESS #4: GENERATE REPORTS

Figure 3-7 shows the decomposition of the Generate Reports process. Sub-processes include:

— Process #4.1: Generate Standard Reports. The capability to generate standard reports shall be provided to the ISS PDS General Users. The ISS PDS Local Administrator shall be able to generate private PRs. The user will be provided the option of choosing which output device will be used for the report. The options are: disk file in ASCII format, printer in postscript format, web page in PDF format.

— Process #4.2: Generate Ad Hoc Reports. The capability to generate ad hoc reports shall be provided to the ISS PDS General Users. The ISS PDS Local Administrator shall be able to generate private PR ad-hoc reports.

— Process #4.3: Generate Metric Reports. The capability to generate metric reports shall be provided to the ISS PDS General Users. The ISS PDS Local Administrator shall be able to generate private PR metric reports.
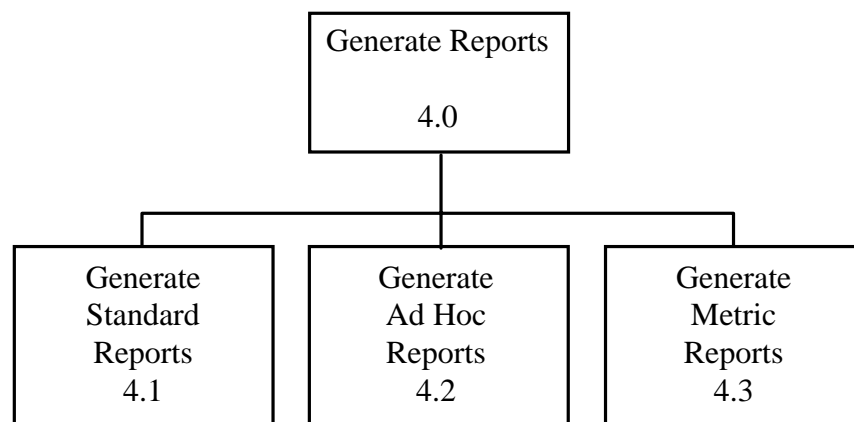
Figure 3-7 PPDD Generate Reports Diagram

3.4.5   PROCESS #5: PERFORM ISS PDS ADMINISTRATIVE FUNCTIONS

Figure 3-8 shows the decomposition of the Perform ISS PDS Administrative Functions process. Sub-processes include:

—   Process #5.1: Maintain User Profiles/Roles. The ISS PDS Local Administrators shall have the capability to maintain ISS PDS User Profiles and Roles for this organization.

—   Process #5.2: Maintain PRACA Tables. The ISS PDS Data Administrator shall have the capability to maintain ISS PDS data tables.

—   Process #5.3 Create/Maintain Distribution Lists.   The ISS PDS Local Administrator shall have the capability to create and maintain distribution lists.

—   Process #5.4: Re-assign Problem to Responsible Organization. The ISS PDS shall allow an ISS PDS Local Administrator the ability to transfer a PR to another organization. The PR must be a public PR before it can be transferred. The ISS PDS Local Administrator of the receiving organization must accept or reject the PR. A PR is locked when in the process of being transferred.

—   Process #5.5: Assign Problem to PRT. The ISS PDS shall provide an ISS PDS Local Administrator the capability to assign a PR to a PRT.

—   Process #5.6: PRT Maintenance. The ISS PDS shall provide an ISS PDS Local Administrator the capability to maintain PRTs. This maintenance shall be defining a PRT, adding and deleting members of a PRT and assigning PRs to a PRT.

—   Process #5.7: Modify Problem Status. The capability to modify problem status shall be provided to the ISS PDS Power User.
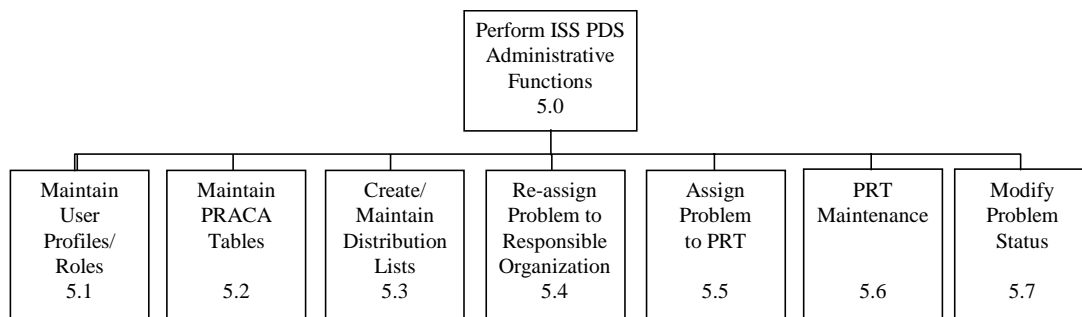
Figure 3-8 PPDD Perform ISS PDS Administrative Functions

3.4.6   PROCESS #6: PERFORM TREND ANALYSIS

Figure 3-9 shows the decomposition of the Perform Trend Analyses processes. The implementation of trending will be fully defined in a future release. Sub-processes include:

— Process #6.1: Create/Modify Trend Routine. Using entry screens, the user can specify ISS PDS data elements and selection criteria for these data elements as well as options for statistical analyses (e.g., type of normalization, goodness of fit trend model) that will serve as inputs into the Trend Analysis Toolbox software. The routines can be named and stored in the users private library. The user has the option to make the routines public.

— Process #6.2: Reference Routine Results to a Problem Report. As part of failure history analysis, a trend routine and specific resultant data sets can be referenced to a specific PR and serve as additional reference material for problem closeout.

— Process #6.3: Execute Trend Routine. Users can submit an existing trend routine to execute immediately or at regular intervals (e.g., every Monday). As part of the execution specification, the resultant data sets and charts can be transmitted to other users or stored in the users private area directory in sequentially named data sets. Users will be able to interactively modify routine parameters in order to determine the presence of trends from the highest generic level (i.e., subsystem) down to individual failure modes for specific components.

— Process #6.4: Edit Routine Results in Report Book. Users can access the Report Books to supplement resultant data sets and charts generated from a trend routine with text. This text should serve to explain whether an adverse trend exists.

— Process #6.5: Distribute Routine Results. Users can copy routine results to a Report Books or to another user via electronic means. Users can transmit data set and charts resulting from an executed routine to the
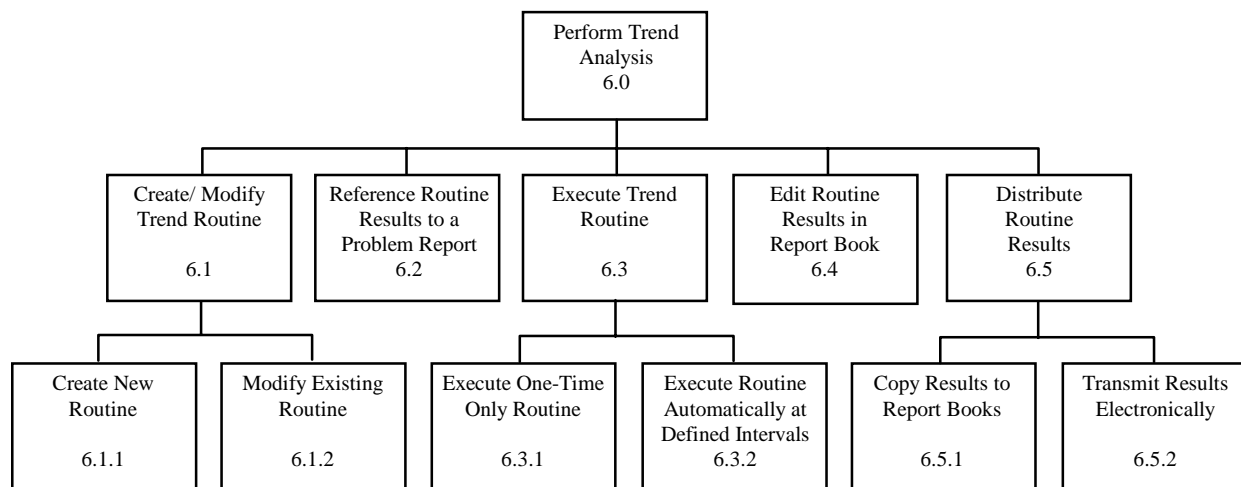
Figure 3-9 PPDD Perform Trend Analysis Diagram

Report Books or to other user(s) via electronic means (e.g., ISS mail).

3.4.7   PROCESS #7: SUSTAINING ENGINEERING ACTIVITIES

Figure 3-10 shows the decomposition of the Sustaining Engineering Activities processes. Sub-processes include:

—   Process #7.1: Failure History Retrieval From ISS PDS. Provide the capability to retrieve significant failure history in support of on-orbit anomaly resolution from the ISS PDS.
—   Process #7.2: Electronic Links to other ISS Applications. Electronic links to other ISS Applications shall be provided to access required information via the PRACA web screens.
—   Process #7.3: Failure History Retrieval From External Databases. Provide the capability to retrieve significant failure history in support of on-orbit anomaly resolution from databases external to the ISS PDS (e.g., GFE Problem Reporting, ISS Software Problem Reporting, etc.).

```
                          ┌─────────────────┐
                          │   Sustaining    │
                          │   Engineering   │
                          │   Activities    │
                          │       7.0       │
                          └─────────────────┘

┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐
│ Failure History │     │ Electronic Links│     │ Failure History │
│ Retrieval From  │     │   to other ISS  │     │ Retrieval From  │
│     ISS PDS     │     │   Applications  │     │     External    │
│                 │     │                 │     │    Database     │
│       7.1       │     │       7.2       │     │       7.3       │
└─────────────────┘     └─────────────────┘     └─────────────────┘
```
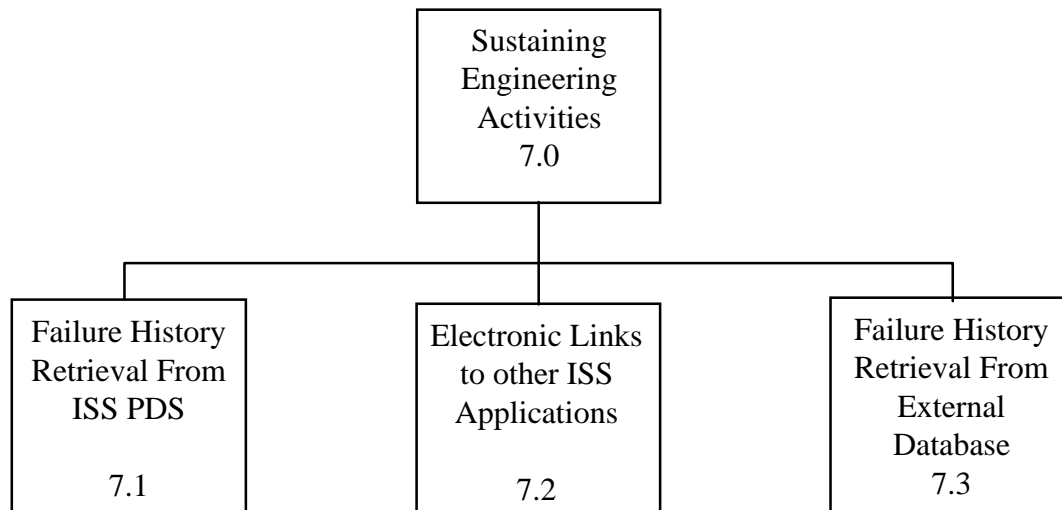
Figure 3-10 PPDD Sustaining Engineering Activities Diagram

3.5   SECURITY

This section describes the security requirements associated with the ISS PDS. Requirements stated in this paragraph cover those security requirements which are in addition to the 'normal' security requirements specified for all Information Systems developed applications.

3.5.1   ISS PRACA ACCESS

No special requirements for ISS PDS beyond normal Information System accesses and security restrictions.

3.5.2   USER AUTHORIZATION

All PRACA User IDs shall be created by the Information System Account Administrator upon the approval of the ISS PDS Data Administrator.

3.5.3   AUTHORIZATION MAINTENANCE

User profiles/roles shall be maintained by ISS PDS Local Administrator regarding data access and security. Users shall maintain their own configurable profile information.

3.5.4   RESTRICTION OF ACCESS TO DATA

Access shall be restricted to users that have access to the ISS team web page.

3.5.5   TRANSACTION LOGGING

The ISS PDS shall record the transaction log-on and log-off time of the last access, date, and the user ID in an audit table.

3.5.6 ELECTRONIC TRANSFER

The ISS PDS shall conform to Class 2 electronic transfer requirements as specified in SSP 3030.

3.6 SYSTEM AVAILABILITY

This paragraph describes the availability requirements associated with the ISS PDS. Requirements stated in this section cover those availability requirements which are in addition, or compatible, to the "high availability" requirements specified for all Information Systems developed applications.

3.6.1 NORMAL HOURS OF OPERATION

Normal hours of operation for the ISS PDS will change with the following four stages:
1.   Until the flight hardware and software for the ISS begin integration testing: The ISS PDS shall be available, at a minimum, from 7 a.m. Eastern time to 5 p.m. Pacific time Monday through Friday. Availability outside of these hours shall be requested by the ISS Application owner per an Information System service request.
2.   After the flight hardware and software for the ISS begin integration testing prior to First Element Launch; The ISS PDS shall be available from 6 a.m. Eastern time until midnight Eastern time 7 days a week. Availability outside of these hours shall be requested by the ISS Application owner per an Information System service request.
3.   After First Element Launch, when the ISS is unmanned and a Shuttle Flight is not in progress: The ISS PDS shall be available from 6 a.m. Eastern time until midnight Eastern time 7 days a week. Availability outside of these hours, Information Systems shall have the system available on short response from the Space Station Control Center or by the ISS Application owner per an Information System service request.
4.   After First Element Launch, when the ISS is manned and/or a Shuttle Flight/Launch countdown is in progress: The ISS PDS shall be available 24 hours a day, 7 days a week. Non-availability shall only be made for emergencies or upon request of the ISS PRACA manager. Normal maintenance shall not remove the ISS PDS from being available. Information Systems shall have a backup (i.e., duplicate) ISS PDS available for use at all times.

3.6.2 DISASTER RECOVERY

Disaster recovery shall be provided by Information Systems in accordance with standard Information Systems disaster recovery plans. At a minimum, a complete backup set of PDS applications and data shall be stored outside of the building housing the PDS.

3.6.3 DATA BACKUP AND ARCHIVING

SSP 30223 requires that all ISS PDS PR data remain in an on-line state for the life of the ISS. All ISS PDS data shall be backed up on a regular schedule.

3.6.4 PERIOD OF DATA RETENTION

The ISS PDS shall be able to maintain the ISS PDS data for the life of the ISS.

3.7 TECHNOLOGY AND TOOLS

Technology and tools requirements per Information System requirements.

3.8 CONFIGURATION MANAGEMENT

Configuration Management requirements per Information Systems requirements.

3.9 TRAINING REQUIREMENTS

Training will be made available for all ISS PDS users. Requirements stated in this section cover those requirements which are in addition, or compatible, to the training requirements specified for all Information Systems developed

applications. Information Systems shall be responsible for providing three types of PDS training methods from which training can be selected by the responsible organizations. These are defined as, classroom, one-on-one, and the training of site trainers. Two courses will be required:

1. General PDS User Course: A General PDS User Course is needed. The course shall cover the ISS PDS's implementation of the SSP 30223 PRACA Requirements Document. Course curriculum shall cover, with hands on training, those features available to the General and ISS PDS Sign-off Users. Additionally, a lecture presentation on other features not available to the General and ISS PDS Sign-off Users shall be included.

2. Advanced PDS User Course: An Advanced PDS User Course is needed. This course shall have the General Course as a pre-requisite. The advanced PDS course shall cover a quick review of the ISS PDS's implementation of the SSP 30223 PRACA Requirements Document and those features available to the General and ISS PDS Sign-off Users. The main goal of the course is to provide hands on in-depth training of those functions available to the responsible organization ISS PDS Local Administrator User Types.

3. The ISS PDS Local Administrator User(s) and ISS PDS Power Users shall receive one-on-one training on the data base design and the application design and features.

4. Provide training on-line via web page access.

4. USER SCENARIOS

The following paragraphs describe the scenarios associated with PR data management utilizing the ISS PDS. These scenarios include PR data input and associated ISS PDS administrative maintenance functions. The scenarios are as follows:

—   Initiate a Problem Identification Report
—   Initiate and Update/ Edit a Problem Resolution Report
—   Provide Electronic Signatures to Close a Problem Report
—   Re-assign a Problem Report
—   Trend Analysis
—   Sustaining Engineering Activities

4.1   Scenario A - Initiate A Problem Identification Report

Scenario A, shown in Figure 4-1, encompasses the process to identify a nonconformance as a PR and the generation of a Problem Identification Report.
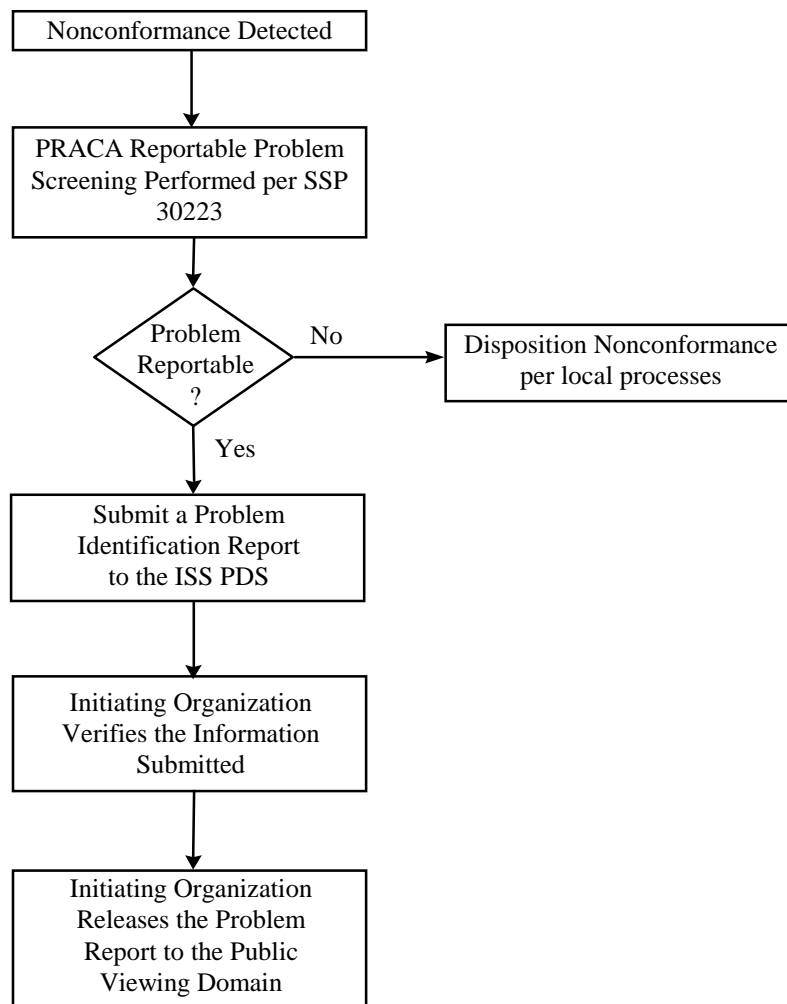
Figure 4-1 Scenario A: Initiate a Problem Identification Report

4.2   Scenario B - Initiate and Update/ Edit a Problem Resolution Report

Scenario B, shown in Figure 4-2, encompasses the process to initiate a Problem Resolution Report and perform update/ edit function until Problem Resolution Report is completed.
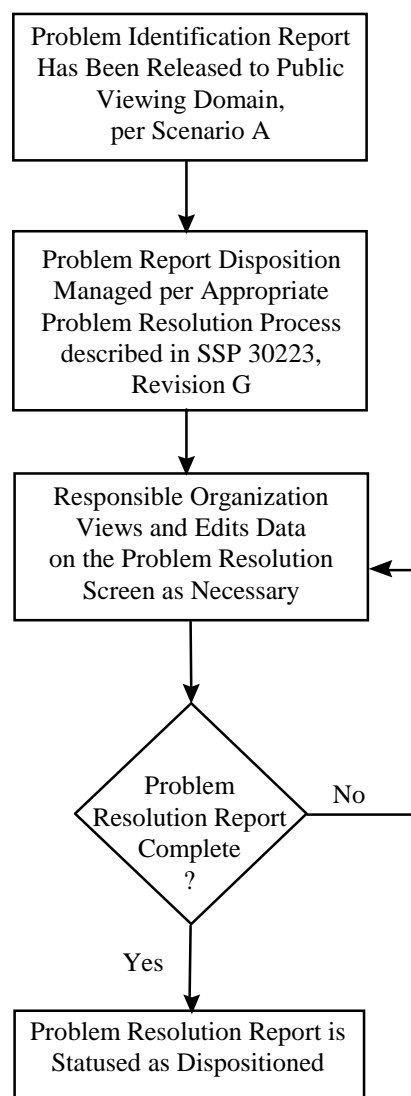
Figure 4-2 Scenario B: Initiate and Update/ Edit a Problem Resolution Report

4.3 Scenario C - Provide Electronic Signatures to Close a Problem Report

Scenario C, shown in Figure 4-3, encompasses the process to provide electronic signatures after a Problem Resolution Report is completed.
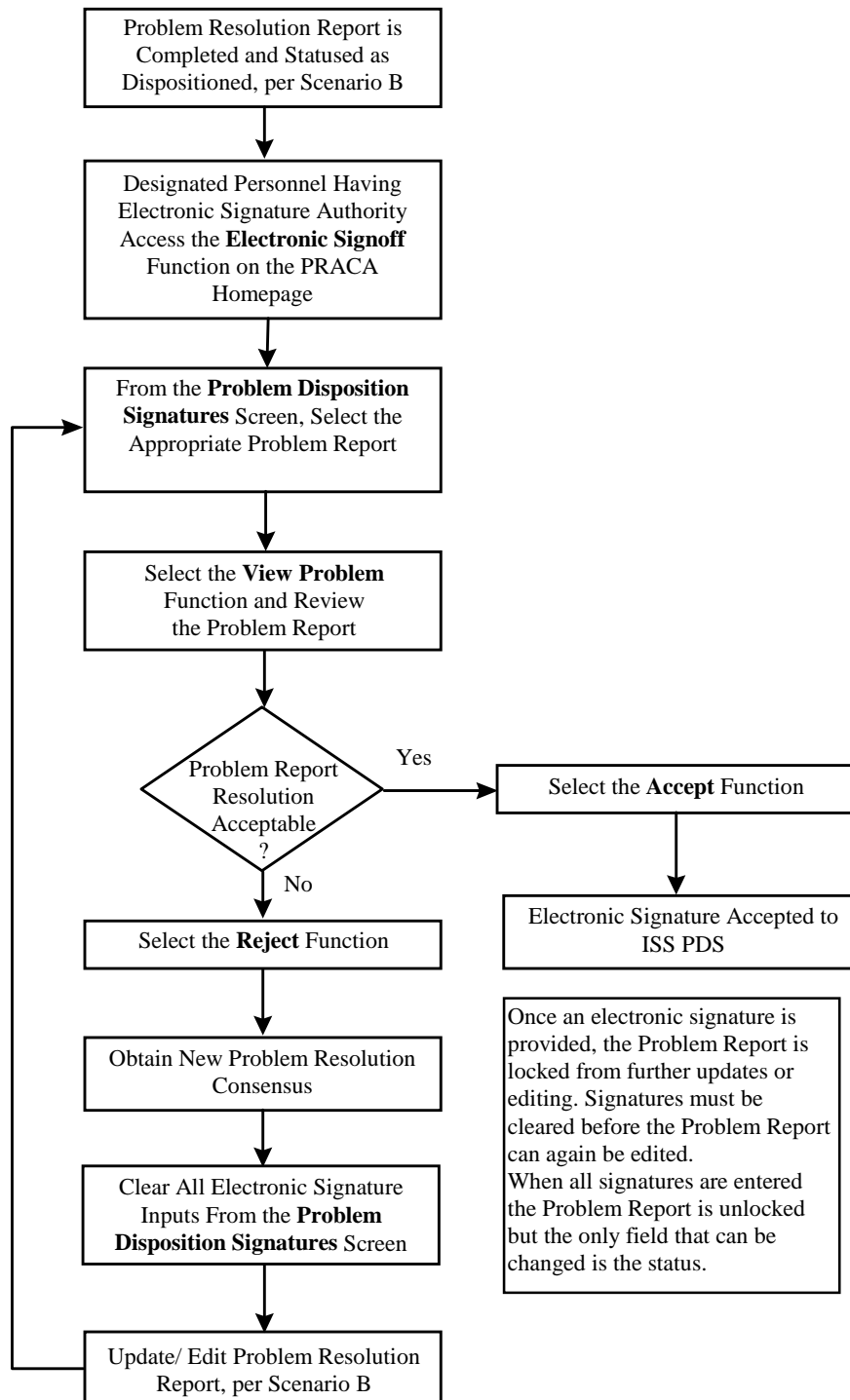
Figure 4-3 Scenario C: Provide Electronic Signatures to Close a Problem Report

4.4 Scenario D - Re-assign a Problem Report

Scenario D, shown in Figure 4-4, encompasses the process to re-assign a PR from one organization to another. PRs shall be initiated at the organization that identified the problem and later assigned to the organization that is responsible for resolution of the problem. Furthermore, this function is appropriate when the design authority responsibilities have been transferred.
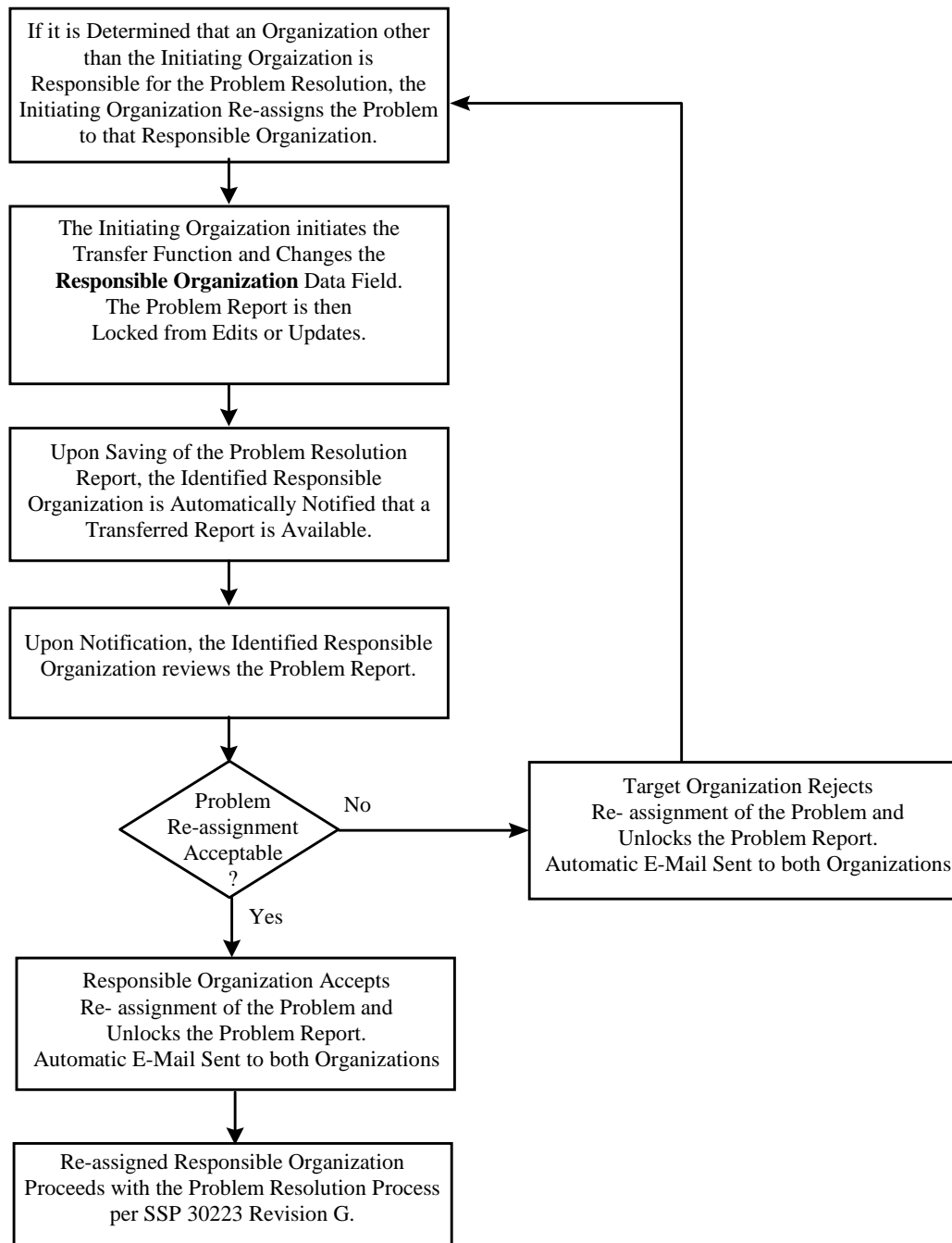
Figure 4-4 Scenario D: Re-assign a Problem Report

4.5 Scenario E - Trend Analysis

Scenario E, as shown in Figure 4-5, describes the problem trend analysis process. This process is automatically performed by the trend analysis function of the ISS PDS and will automatically alert pre-selected individuals if an adverse trend is identified. The trend analysis function will be fully defined in a future release.

a)   Research the ISS PDS and extract data;
b)   Normalize data and construct trend charts for each area of concern (systems, subsystems, parts, etc.);
c)   Prepare summary assessment reports of problem trend analysis.

Trend analysis results will be stored electronically and may be viewed in or downloaded from the ISS PDS.

Figure 4-5, Scenario E: Trend Analysis

1) ISS PDS will automatically initiate the trending function at a specified time interval.

```
ISS PDS automatically initiates the PRACA
Trending Function
```

```
ISS PDS executes the trending routine by:
• Automatic Data Extraction
• Normalize Data
• Construct Charts
• Analysis for Adverse Trends
```

Adverse Trend Identified ? → Trend Assessment complete - No output

2) Trend results shall be placed in a viewable file and maintained by the PDS during the period between trending function executions.

```
Copy output to PRACA Trend Report Book
```

```
ISS PDS automatically notifies preselected
individuals of adverse trend
```

```
ISS PDS Users  access PRACA Trend
Report Book via the PRACA Homepage
```

```
From a system generated list of identified
adverse trends, user selects the appropriate
trend report(s)
```

```
ISS PDS User utilizes trend data as
appropriate
```
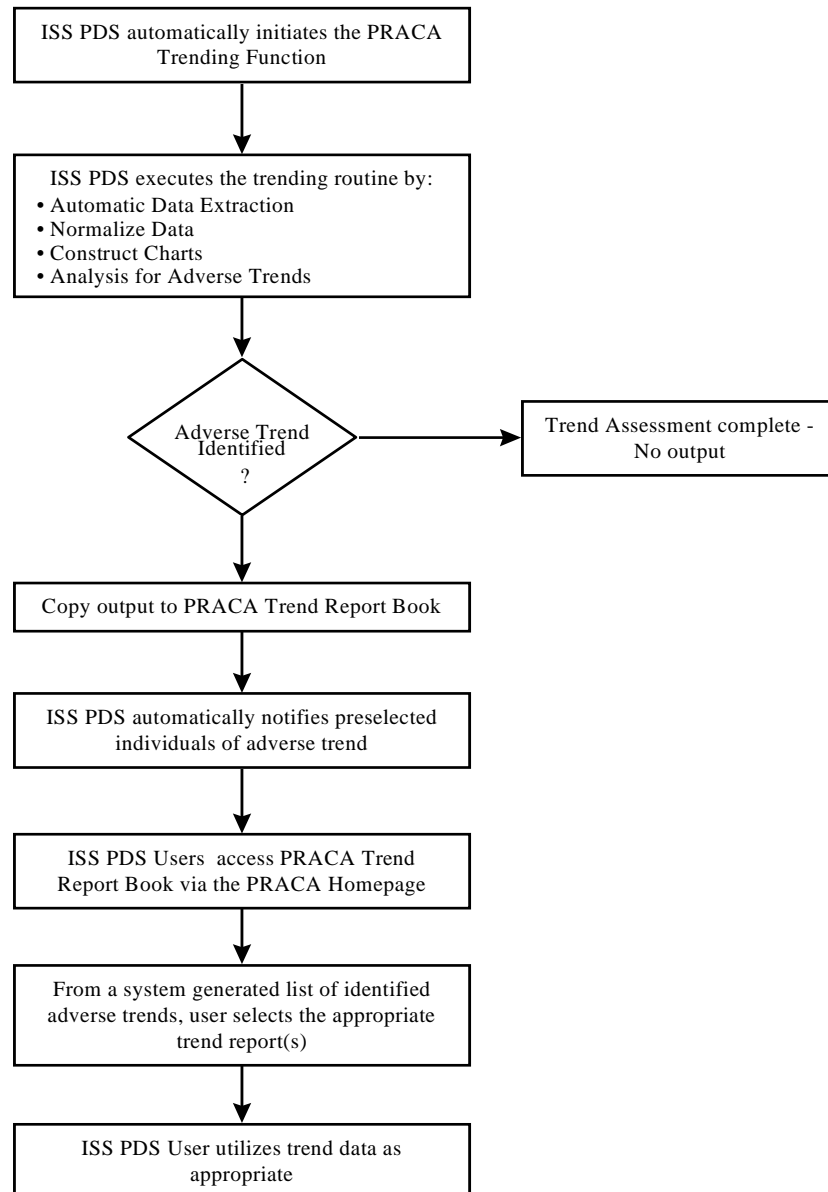
Figure 4-5 Scenario E: Trend Analysis

4.6 Scenario F - Sustaining Engineering Activities

Scenario F, as shown in Figure 4-6, encompasses the sustaining engineering activities process. This scenario is applicable for S&MA personnel supporting on-orbit operations in the Mission Evaluation Room (MER).

1) The majority of sustaining activities will be in support of the Mission Evaluation Room for on-orbit anomalies.

2) Other external database applications can include GFE PRACA, Software Problem Reporting (PMCS), etc.

3) On-orbit anomalies will be screened as to reportability to PRACA. (Needs an IF construct to handle anomalies? Disagree)

On-orbit Anomaly Occurs

ISS PDS User Queries and Retrieves Failure History From the ISS PDS to Support On-Orbit Anomaly Resolution

ISS PDS User Queries and Retrieves Failure History From Other External Database Applications to Support On-Orbit Anomaly Resolution

Failure History is Analyzed and Reported to Anomaly Resolution Team

Proceed to Scenario A

If a Problem Report is Generated, Re-assign Problem to the appropriate Responsible Organization per Scenario D

Figure 4-6 Scenario E: Sustaining Engineering Activities

APPENDIX A - <u>ABBREVIATIONS AND ACRONYMS</u>

COTS	Commercial Off The Shelf
DFD	Data Flow Diagram
GFE	Government Furnished Equipment
HHRS	Hardware History Retrieval System
ICD	Interface Control Documents
IFA	In-Flight Anomaly
IS	Information System
ISS	International Space Station
ISSPO	International Space Station Program Office
JSC	Johnson Space Center
KSC	Kennedy Space Center
MER	Mission Evaluation Room
PALS	Program Automated Library System
PDMS	Payload Data Management System
PDS	PRACA Data System
PPDS	PDS Process Decomposition Diagram
PR	Problem Report
PRACA	Problem Reporting and Corrective Action
PRT	Problem Resolution Team
RDD	Requirements Definition Document
S&MA	Safety & Mission Assurance
SE	Sustaining Engineering
VMDB	Vehicle Master Data Base

APPENDIX B - <u>Code Descriptions</u>

Definitions of codes used in the lookup tables:

Organization Code	Organizations Description
AMES	NASA Ames Research Center
Boeing_CP	Boeing - Canoga Park Work Center
Boeing_HB	Boeing - Huntington Beach Work Center
Boeing_HOU	Boeing - Houston Work Center
Boeing_HSV	Boeing - Huntsville Work Center
Boeing_KSC	Boeing - Kennedy Space Center
Boeing_SCTF	Boeing - Sunny Carter Training Facility
CSA	Canadian Space Agency
ESA	European Space Agency
GFE	Government Provided Equipment
GSFC	Goddard Space Flight Center
ISAC	Information Systems Analysis and Integration Team Contract
ISSPO	International Space Station Program Office
JSC	Johnson Space Center
KhSC	M.V. Krunichev State Research and Production Space Center
KSC	Kennedy Space Center
LARC	Langley Research Center
LERC	Lewis Research Center
MM	Martin Marrieta
MSFC	Marshall Space Flight Center
NASA	National Aeronautics and Space Administration
NASDA	Japan
RSA	Russian Space Agency
RSC	Rocket Space Corporation - ENERGIA
SPAR	SPAR-CSA
STS	Space Transportation System

Table 4-1 Organization Code Values Table

Code	Description
AI	Acceptance Test Procedure, initial testing
AS	Acceptance Test Procedure, NOT initial test
DQ	Qualification or certification test
DT	Development test
FI	Fabrication/Manufacturing (initial build of hardware only)
IP	Field detected post-flight inspection
IS	Inspection (Field) scheduled (Not PM)
IU	Inspection (Field) unscheduled/surveillance
IX	Inspection due to ALERT
MO	Maintenance/Repair (after initial manufacturing)
MP	Preventive maintenance, routine refurbishment
OA	On-orbit assembly
OC	On-Orbit Checkout
OF	In-flight anomaly (non-operational ISS equipment)
OO	On-orbit (operational)
S	Shipping/transporting

SI	Cargo Installation/Removal
SU	Shipping/unpacking
TF	Field detected - testing not during launch processing
TL	Field detected - Lab type testing/usage prior 1st flight H/W
TLP	Field detected - OMRSD type test during launch processing
Y	Cannot be determined

Table 1-2 Test/Operation Code Values Table

Code	Description
E	End item
L	LRU
N	NHA
O	ORU
P	Piece Part
S	SRU

Table 1-3 Indenture Level Code Values Table

Code	Description
C&T	Communications and Tracking System
DMS	Data Management System
ECLSS	Environmental Control and Life Support System
ELMUNIQ	Element Unique
EPS	Electrical Power System
ETCS	External Thermal Control System
EVAS	Extravehicular Activity System
GN&C	Guidance, Navigation and Control System
ITCS	Internal Thermal Control System
MECH	Mechanisms
MS	Man Systems
PROPUL	Propulsion System
STRUCT	Structures

Table 1-4 Distributed System Name Values Table

Code	Description
ACS	ECLSS Atmosphere Control and Supply
ARS	ECLSS Atmosphere Revitalization
ASSYCONT	C&T Assembly/Contingency
AVAIR	ECLSS Avionics Air Cooling
BER&DOC	MECH Berthing and Docking
BGSA	EPS Beta Gimbal/Solar Array
C&TCM	C&T Control and Monitoring
CABAIR	ECLSS Cabin Air Cooling
CERS	EVAS Crew Equipment Retrieval
CHECS	MS Crew Health Care System
CMG	GN&C Control Moment Gyros
CPA	MS Crew Privacy Accommodations
DATAPROC	DMS Data Processing
DATATRAN	DMS Data Transfer
DECAL	MS Decals and Placards

Code	Description
DMSUSER	DMS User Interface
EMU	EVAS Extravehicular Maneuvering Unit
ETCSMC	ETCS System Monitor/Control
EXTVID	C&T External Video
FDS	ECLSS Fire Detection and Suppression
GALLEY	MS Galley/Food Management
H&W	MECH Hatch and Windows
HAL	EVAS Hyperbaric Airlock
HSKPG	MS Housekeeping/Trash Management
HTCOLL	ITCS Heat Collection (H2O) (Low Temp and Mod Temp)
HTREJ	ETCS Heat Rejection (Radiator)
HYDRZ	PROPUL Hydrazine
IAS	C&T Internal Audio
IEA	EPS Integrated Equipment Assembly
ILLUM	MS Illumination
INVMGMT	MS Inventory Management
IP&S	MS Interfacing Partitions and Structures
ISA	GN&C Inertial Sensor Assembly
ITCSMC	ITCS System Monitor/Control
IVS	C&T Internal Video
LOWTEMP	ETCS Heat Transport (Low Temp)
MAIN	MS On-Orbit Maintenance
MDM	DMS Multi/Demultiplexer
MODTEMP	ETCS Heat Transport (Mod Temp)
OPE	MS Operational and Personal Equipment
PASTHRMLE	ETCS Passive Thermal (Ext)
PASTHRMLI	ITCS Passive Thermal (Int)
PEP	MS Portable Emergency Provisions
PH	MS Personal Hygiene
PIT	STRUCT Pre-Integrated Truss
PMAD	EPS Power Management and Distribution
PRIMY	STRUCT Primary Structure
R&MA	MS Restraints and Mobility Aids
RACK	STRUCT Rack
RJET	PROPUL Resistojet
SECND	STRUCT Secondary
SPCU	EVAS Service and Performance C/O Unit
SPTOGR	C&T Space to Ground
STOW	MS Stowage
STRJNT	MECH Structural Joints
THC	ECLSS Temperature and Humidity Control
TOOLEQ	EVAS Tools/Equipment
TRACK	C&T Tracking
TRNSL	EVAS Translation Aids
UHF	C&T UHF Communications
WDRM	MS Wardroom
WKSTNS	MS Integrated Workstations
WM	ECLSS Waste Management
WRM	ECLSS Water Recovery and Management

Table 1-5 Distributed Subsystem Name Values Table

Code	Description
ACRV	Assured Crew Return Vehicle (ACRV)
AL	Airlock (AL)
APM	Columbus Attached Pressurized Module (APM)
BDM	SSPF/SSP Berthing/Docking Mechanisms (BDMs)
ELM	Japanese Experimental Module (JEM) Experiment Logistics Module (ELM)
HAB	Habitation Module (HAB)
ITA	Integrated Truss Assembly (ITA)
JEM	Japanese Experimental Module (JEM) Laboratory and Exposed Facility
MMD	Mobile Servicing Centre Maintenance Depot (MMD)
MPLM	Mini Pressurized Logistics Module (MPLM)
MSC	Mobile Servicing Centre (MSC)
MT	Mobile Transporter (MT)
N1	Resource Node 1 (N1)
N2	Resource Node 2 (N2)
PLM	Pressurized Logistics Module (PLM)
PROP	Propulsion Assembly (PROP)
SPDM	Special Purpose Dexterous Manipulator (SPDM)
SPM	Solar Power Module (SPM)
ULE	Unpressurized Logistics Element (ULE)
USL	U.S. Laboratory Module (USL)

Table 1-6 Flight Element Code Values Table

Site Code	Site Description
Boeing_CP	Boeing - Canoga Park Work Center
Boeing_HB	Boeing - Huntington Beach Work Center
Boeing_HOU	Boeing - Houston Work Center
Boeing_HSV	Boeing - Huntsville Work Center
Boeing_KSC	Boeing - Kennedy Space Center
Boeing_SCTF	Boeing - Sunny Carter Training Facility
GFE	GFE
IFA	In Transit to/from Orbit
ITG	In Transit Ground
JSC	Johnson Space Center
LERC	Lewis Research Center
MM-DENVER	Martin Marietta - Denver
MSFC	Marshall Space Flight Center
NASDA	Nat'l Space Development Agency of Japan
OOA	On Orbit Assembly
RSA	Russian Space Agency
RSC	Rocket Space Corporation - Energia
SPAR	SPAR
VANDENBERG	Vandenberg
WSTF	White Sands Test Facility

Table 1-7 Site Location Code Values Table

Code	Description

DESIGN	Design
DH	Hardware design
DHA	Hardware design -Age (time)
DHC	Hardware design -Life (Cycle)
DHE	Hardware design -Hardware design environment (chemical or physical)
DHF	Hardware design -Operational Flow
DHH	Hardware design -High cycle fatigue
DHL	Hardware design -Low cycle fatigue
DHM	Hardware design -Operational chemical environment
DHO	Hardware design -Overstress/loads
DHP	Hardware design -Hardware design instructions, planning, or procedures
DHT	Hardware design -Operational thermal environment
DHV	Hardware design -Operational vibration
DS	Software design
DW	Software design -Hardware design workmanship
E	Externally induced (EI)
EOE	-EMI
ES	Induced by shipping, transporting, or handling
ESE	Induced by shipping, transporting, or handling environment (chemical or physical)
ESP	Induced by shipping, transporting, or handling instructions, planning, or procedures
EST	Induced by shipping, transporting, or handling equipment or tooling
ESW	Induced by shipping, transporting, or handling workmanship
ET	Induced by test/use (formal ATP and subsequent)
ETE	Induced by test/use (formal ATP and subsequent) environment (chemical or physical)
ETP	Induced by test/use (formal ATP and subsequent) instructions, planning, inspection, (damaged during inspection of other hardware) or procedures
ETT	Induced by test/use (formal ATP and subsequent) equipment of tooling
ETW	Induced by test/use (formal ATP and subsequent) workmanship
F	Failure, indication, but failure does not exist
M	Manufacturing
MA	Manufacturing assembly or fabrication
MAE	Manufacturing assembly of fabrication environment (chemical of physical)
MAP	Manufacturing assembly or fabrication instructions, planning, or procedures
MAT	Manufacturing assembly or fabrication equipment or tooling
MAW	Manufacturing assembly or fabrication workmanship
MM	Manufacturing moving or transportation (handling)
MME	Manufacturing moving or transportation (handling) environment (chemical or physical)
MMP	Manufacturing moving or transportation (handling) instructions, planning, or procedures
MMT	Manufacturing moving or transportation (handling) equipment or tooling
MMW	Manufacturing moving or transportation (handling) workmanship
MN	Manufacturing inspection
MNE	Manufacturing inspection environment (chemical or physical)
MNP	Manufacturing inspection instructions, planning, or procedures
MNT	Manufacturing inspection equipment or tooling
MNW	Manufacturing inspection workmanship
MP	Manufacturing process (except assembly, inspection, and test)
MPE	Manufacturing process (except assembly, inspection, and test) environment

	(chemical or physical)
MPP	Manufacturing process (except assembly, inspection, and test) instructions, planning, or procedures
MPT	Manufacturing process (except assembly, inspection, and test) equipment or tooling
MPW	Manufacturing process (except assembly, inspection, and test) workmanship
MT	Manufacturing test (pre-ATP)
MTE	Manufacturing test (pre-ATP) environment (chemical or physical)
MTP	Manufacturing test (pre-ATP) instructions, planning, or procedures
MTT	Manufacturing test (pre-ATP) equipment or tooling
MTW	Manufacturing test (pre-ATP) workmanship
OA	Operator induced caused by operator error (on orbit)
OB	Caused by improper command by other than direct operator
OC	Improper instruction/procedure
OD	Software induced
OH	Induced by failure or improper operation of other hardware
OO	Other
S	Software
U	Cause unknown
UA	Cause unknown - One time anomaly
UF	Cause unknown - Unexplained anomaly in flight hardware
UK	Cause unknown - Failure analysis/investigation not performed
UN	Cause unknown - Unexplained anomaly in nonflight certified hardware
Z	None - Problem reported in error
ZI	None - Incorrect fault isolation

Table 1-8 Reportable Problem Code Values Table

Code	Description	One Signature
C	Closed	
CI	Interim Closure	
CL	Closed - Linked	Y
CN	Closed - Not a Reportable Problem	Y
D	Dispositioned	
O	Open	

Table 1-9 Status Code Values Table

Code	Description
EAF	Fails Off
EAN	No output
EB	Fails on
EC	Premature inadvertent output (operation) or shutdown
ED	Delayed output (operation) or shutdown
EE	Random output (output is completely random at all times)
EED	Output data values erratic
EES	Output signal erratic due to improper switch operation
EF	Intermittent output (device has inconsistent output)
EG	Signal level high or low, or zero level shift
EH	Digital data error
EI	Computer halt/interrupt

Code	Description
EJ	Waveform or bias incorrect
EJB	Bandwidth too broad or too narrow
EJN	Electrical signal to noise rejection low
EJR	Antenna radiation pattern error
EJV	VSWR out of spec, impedance mismatch, return signal loss
EK	Out of phase
EKS	Loss of electrical signal lock or synchronization
EL	Short, low resistance, low voltage or high current
EM	Arcing, corona, or static discharge
EMI	EMI condition
EN	Open, high resistance, high voltage or low current
EQ	Incorrect output present (category not available)
ET	Measurement anomaly (Detailed code used by NSTS-Orbiter)
EV	Not to spec
EVA	Velocity data out of spec
EVB	Resolver data out of spec limits
EVC	Gyro/accelerometer axis alignment out of spec/drifting
EVD	Gyro/accelerometer bias out of spec/drifting
EVE	Gyro/accelerometer scale factor out of spec/drifting
EVF	Timing/position error in slewing/torquing inertial platform
EVG	Inertial platform gimbal angle out of spec/drifting
EVH	Parameter deviation in excess of 1 or3 sigma spec limits
EVJ	Built in test equipment indicates hardware failure
EVK	Failure in BITE circuit (BITE on BITE)
EVL	Failure ID flag indicating instrumentation failed
EVM	Continuity/megger failure
EVN	Servo interrupt/miscompare
EVP	Out of tolerance (function)
MA	Fails to start
MB	Fails to stop
MC	Premature, fast, premature cutoff, or inadvertent operation
MD	Delayed or slow operation
ME	Random
MF	Intermittent
MMB	Binding, jamming, or seizing
MMR	Rubbing or fretting
MO	Vibration MSFC Code
MP	Fails open or fails to close (or retract) completely
MQ	Fails closed or fails to open (or extend) completely
MR	Output torque high of low
MS	Structure or insulation failure
MSI	Thermal protection loss, inadequate insulation
MT	Temp of pressure high or low
MU	Out of tolerance (functional)
MV	External leakage
MW	Internal leakage
MX	Flow or thrusts anomalies
MXC	Flow anomaly -cavitation
NA	Not Applicable
OO	Other

Code	Description
ZZ	No problem

Table 1-10 Failure Mode Code Values Table

Code	Description
CE	Detail item or part extraneous, where not required
CN	Contaminated, dirty or wet; inclusions in material
CR	Corroded, oxidized, pitted, or rusted
CX	Material includes bubbles, holes, or voids; or porosity excessive
DA	Damaged surface - Abraded, chipped, dinged, gouged, nicked, roughed or scratched
DB	Damaged shape - Bent, buckled, crimped, collapsed, crushed, deformed, expanded, shrunk, or twisted
DC	Damaged structure - Broken, burst, cracked, cut, fractured, punctured, ruptured, shattered, split, or torn
DD	Damaged - Material delaminated, detached, flaking, loose, peeling, or separated
EM	Electrically misadjusted, misaligned, miscalibrated, or mismatched
EP	Electrical value of item or electrical, electronic, Electromechanical (EEE) part found to be inappropriate or incorrect
ER	(Pin) protruding or recessed
ES	Electrically overstressed
ET	Damaged by Electrostatic Discharge (ESD)
HD	Damaged - Burnt, melted, overheated, or scorched
HS	Temperature sensitivity affecting function - No more specific defect applies
MA	Mechanically misadjusted, misaligned, mispositioned misrouted, or miswired - If not MISFIT or TORQUE
MB	Improper torque threaded assembly
MC	Clearance excessive or insufficient; structural misfit, mismatched
MD	Material dimension or weight excessive or insufficient - If not MISFIT or WORN
ME	Damaged by corrosion, friction, or wear
ML	Degraded by age, radiation, or rot; life limit exceeded
MM	Material, part, or software missing or omitted (oversight in assembly)
MT	Material, part type, or software inappropriate, incorrect, or mislabeled; wrong part specified or used
MU	Material overstressed/overpressurized (no true defect identified)
MW	Miswired or misrouted
NA	Not Applicable
OO	Other
PA	Electrical leakage
PB	Failure of gross hermetic leakage test
PC	Failure of fine hermetic leakage test
PE	Viod, hole, hillock
PF	Migration of metal in EEE Part
PG	Intermetalic growth, "purple plague"
PK	EEE Part contaminated with internal particles
PL	EEE Part material chemically contaminated internally/externally
PP	Incorrect temperature associated with EEE part process (curing, etc)
PQ	Incorrect time associated with EEE part process (curing, etc)
PR	Wrong EEE Part used
PS	Open in EEE part circuitry
PT	Short in EEE part internal circuitry
PU	Material in EEE part smeared

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Code	Description
PW	Dimension in EEE part incorrect/wrong
PX	Problem unconfirmed, part check out OK
PZ	EEE Part defect
XA	No failure analysis performed at all
XB	No failure analysis performed on parts
XN	No defect applicable
XU	Defect unknown - unexplained anomaly

Table 1-11 Defect Code Values Table

Code	Description
A	Electrical circuit element(s) - No more specific classification applies
B	Electrical circuit board - No more specific classification applies
C	EEE Part - Capacitor, connector, transistor, diode, integrated circuit, resistor, etc. (FSCN. group 59) - No more specific classification applies
CA	Defect in EEE part subcomponent - no lower classification possible
CB	Defect in EEE part external lead
CC	Defect in EEE part case/package
CD	Defect in EEE part metallization
CE	Defect in EEE part passivation or glassification coating
CF	Defect in EEE part bond wire dressing
CG	Defect in EEE part internal wire (not bondwire)
CH	Defect in EEE part relays/switch contacts/ wiper
CJ	Defect in EEE part manufacturing process
CK	Defect in epoxy material in EEE part (not die attach)
CL	Defect in bonding EEE part die
CN	Defect in spring within EEE part
CP	Defect in EEE part internal wire bonding pad
CQ	Defect in EEE part marking/labeling
CR	Defect in bearing/rotor/pivot
CS	Electrically conducting pin, socket(connector) or terminal
CT	Defect in crimp (electrical terminations/thermal compression bond)
D	Active or passive element of an electronic circuit device
E	Electrical conductor - Circuit breaker, switch contacts, or wipers; connector pin, part lead or wire
F	Encapsulation, insulation, or potting
G	Solder
H	Braze or weld - Metallurgical, thermal compression, or ultrasonic bond
J	Finish, lacquer, paint, or plating
K	Adhesive, chemical bond, or lamination
L	Fastener - Bolt, nut, cotter pin, rivet, screw, tie-down, etc.
M	Mechanism; hydraulic or mechanical drive linkage element(s) - No more specific classification applies
N	Hole, nozzle, orifice, or vent; poppet
O	Other
P	Diaphragm; gasket, O-ring, or seal
Q	Grease, lubricant, or oil
R	Fluid - Gas or liquid, but not lube
S	Structural element(s) or material - No more specific classification applies
T	Substrate material - No more specific classification applies

Code	Description
W	Magnetic or optical recording media
X	Software or firmware algorithm - No hardware detail applies
Y	Manner or mode of operation or use - No detail applicable
Z	No material defect applies

Table 1-12 Material Code Values Table

Code	Description
1	Console Operator Error-Nonconformance resulting from an incorrect command entered from a terminal or console
2	Design Deficiency/nonconformance-Caused by insufficient or incorrect drawing or specification requirements. (In most cases this requires an engineering change or material review type disposition.)
3	Procedure/work auth error-Nonconformance resulting from mistakes in WADs. Includes procedural logic deficiencies, incorrect instructions or callouts, etc.
4	Workmanship (Fabrication/installation/ buildup error) - Nonconformance due to noncompliance with prescribed procedures, instructions (rules), or damage(nonconformance) resulting from human error.
6	Failure/damage due to Associated equipment malfunction.
7	Expired/Limited shelf life/service
8	Failure - Used when a functional component does not perform to specification and requires additional investigation to determine the cause.
9	Materials deficiency/degradation - Non conformance as a result of material not performing due to weakness (aging, settling, etc.) or composition defect. Does not include expired shelf life, environmental damage, or operational degradation.
A	Vendor responsibility - Applies only to nonconformances apparently caused by vendors. Used especially when part is discrepant upon receipt or installation.
B	Shipping/handling damage - any damage incurred during transporting of hardware
C	Contamination
D	Environmental damage - damage resulting from exposure to operational or environmental elements.
E	Launch damage(Pad fac & GSE) - Not to be used for flight hardware. (See Code P - Flight Damage)
F	Removed per cannibalization
H	S/W Prog/Coding error - Incorrect, missing logic, or syntax error
L	Unexplained anomaly - a condition (ghost/phantom) which cannot be duplicated
M	Insufficient Data
N	No discrepancy/explained condition - Used when investigation or troubleshooting determines the condition is normal to system operation.
P	Flight damage - Applies to flight hardware between "T Minus 0" to "Wheel Stop" on landing or SRB splashdown.
R	Housekeeping -
S	Interference - Physical/electronic (Not to be used when caused by design, workmanship, or other applicable cause code.)
T	Operational degradation/wearout - Nonconformances resulting from expected wear and tear during operation or functioning or equipment.
U	Unavoidable damage/nonoconformance - Damage/nonconformance as a direct result of rework, repair, or normal processing.
V	Designated Verification (DV) escape - Step in process accepted by a DV that is later determined by QC to be in error.
W	Planning/scheduling error

Table 1-13 Cause Code Values Table

Code	Description

Code	Description
1	Single point Failure; loss of SSMB, flight, ground personnel
1P	Single point failure protected by safety device
1R	Redundant items; loss of SSMB, flight, ground personnel
1S	Single point failure of safety device or component
1SR	Failure of redundant system components that provide safety
2	Single point failure that results in loss of mission support
2R	Redundant item failures causing loss of mission support
3	All others

Table 1-14 FMEA Criticality Code Values Table

Code	Translation	Description
A	PURG	Parts/componenets purged from inventory
B	WAIVER	None - waiver
C	OPER	Change in operational procedure
D	OTHER	Other
Q	QA/QC	Change in Quality Requirements
0	EXPL	Explanation rather than corrective action. To be the primary code if the problem is explained for any operation.
1	DES	Design change (engineering order released, drawing change, etc.) approved by NASA
2	MFG	Manufacturing method, procedure, or process changed
3	F/TE	Facility or test, or inspection equipment changed
4	TEST	Test or operating, or inspection procedure changed
5	TRNG	Training or certification of personnel changed
6	MNTN	Maintenance changed (other than a change in time or cycle use limit)
7	LT/C	Limit time or cycle use of component
8	SHIP	Shipping or transportation changed
9	SE	Support equipment changed

Table 1-15 Recurrence Control Code Values Table

Code		Description
A	SOLAR	Solar Activity
C	EMI	Electromagnetic interference (EMI)
EO	OP ENVIRON	Operational environment (rain, lightening, freezing temp)
ET	ENVIRON TEST	Environment (salt, fog, humidity, etc.)
F	FUNCTIONAL	Functional test or use
FC	CALIBRATION	Hanger or Laboratory calibration
FL	FLIGHT	Liftoff or Landing
IF	IN FIELD	Field testing/operation prior to first flight
IS	IN FIELD	Field testing/operation subsequent of first flight
L	LIFE TEST	Life test
N	INSPECTION	Inspection
O	OTHER	Other (condition known, but no code applicable)
P	PRESSURE	Pressure
Q	THERMAL VAC	Thermal vacuum
R	STORAGE	Storage
S	SHIPPING	Handling, packaging, shipping, or transportation
T	THERMAL	Thermal cycle or soak
U	UNK	Unknown

Code		Description
V	VIBRATION	Vibration
X	ALERT	ALERT report

Table 1-16 Prevailing Condition Code Values Table

Code	Description
002	TEMPORARY INSTALLED HDWR.-NOT REMOVED
003	BOUNCE
008	NOISY
009	DRIVE TRAIN/MOTOR FAULTY
010	FOCUS POOR OR INCORRECT
011	SOLDERING FAULTY
012	SWITCH FAULTY
013	FAN FAULTY
014	WIRE/CONDUCTOR/CABLE INSULATION FAULTY
015	WIRE/CONDUCTOR/CABLE FAULTY
016	WIRE/CONDUCTOR/CABLE SHIELD FAULTY
017	DISCOLORED/STAINED
018	DRAWING/SPECIFICATION ERROR
019	THREADS GALLED/ DEFECTIVE
020	WORN, CHAFED, OR FRAYED
021	INTERFERENCE (PHYSICAL)
022	FLAKING/PEELING
023	TRANSISTOR FAULTY
024	DIODE FAULTY
026	INTEGRATED CIRCUIT FAULTY
029	AMPERAGE/CURRENT INCORRECT
030	SEAL/GASKET/O-RING DAMAGED
031	SHARP/PROTRUDING OBJECT
034	UNAUTHORIZED WORK
035	CLEANLINESS INCORRECT/VOIDED
036	SEALING SURFACES FAULTY
037	FLUCTUATES, UNSTABLE, OR ERRATIC
038	SHELF/AGE LIFE EXPIRED
039	TIME/CYCLE LIMITS EXCEEDED
040	SAMPLES FAILED ANALYSIS
042	MATERIALS INCORRECT
043	COMPONENT HAS MISSING/DEFECTIVE SUBCOMPONENT PART
044	MEMORY PLANE DEFECTIVE
046	SIGNAL LOST/INCORRECT
064	MODULATION INCORRECT
070	BROKEN
080	BURNED OUT OR DEFECTIVE LAMP, METER, OR INDICATING DEVICE
084	PACKAGING IMPROPER
085	DOCUMENTATION IMPROPEER/MISSING
086	HANDLING IMPROPER
088	GAIN INCORRECT
092	MISMATCHED
093	DIMENSION(S) INCORRECT
094	KEYBOARD DEFECTIVE
095	BELT DEFECTIVE
096	REPAIR INCORRECT
105	COMMON HARDWARE LOOSE/DAMAGED (BOLTS, NUTS, SCREWS, RIVETS, FASTENERS, CLAMPS, ETC.)
106	COMMON HARDWARE MISSING (BOLTS, NUTS, SCREWS, RIVETS, FASTENERS, CLAMPS,

Code	Description
	ETC.)
108	SAFETY WIRE OR KEY BROKEN, FAULTY OR MISSING
111	BURST OR RUPTURED
116	CUT
117	DETERIORATED
127	ADJUSTMENT OR ALIGNMENT IMPROPER
128	FLOW RATE INCORRECT
135	BINDING, STUCK, OR JAMMED
137	BELLOWS DEFECTIVE
159	CONFIGURATION INCORRECT
160	CONTACTS/CONNECTION DEFECTIVE (PINS BENT/RECESSED/NOT PROPERLY SEATED ETC)
161	CRIMP FAULTY
167	TORQUE INCORRECT
168	PHASING ERROR/PHASE REVERSAL
169	VOLTAGE INCORRECT
170	CORRODED
178	FLUID/GAS LEVEL INCORRECT
181	COMPRESSION FAULTY
190	CRACKED
206	GOUGES
207	VOIDS
208	PULL TEST FAILURE
209	DENSITY TEST FAILURE
211	POT LIFE EXPIRED
213	PUNCTURE/PINHOLE
214	BUBBLE/BLISTER
216	ROUGHNESS/WAVINESS
217	STEP/GAP OUT OF TOLERANCE
218	STITCHING DEFECTIVE
220	WATERPROOFING FAULTY/MISSING
221	BOND FAULTY
223	GAP FILLER DAMAGED
224	GAP FILLER MISSING
225	POPPET FAILURE/FAULTY
226	POWER OUTAGE (FACILITY)
227	ENVIRONMENT SPECIFICATION EXCEEDED
228	BACKSHELL BROKEN/LOOSE
230	DIRTY, CONTAMINATED, OR SATURATED BY FOREIGN MATERIAL
241	HYDROSTAT FAILED
242	FAILED TO OPERATE OR FUNCTION, SPECIFIC REASON UNKNOWN
245	PROOF TEST/PROOFLOAD FAILS
246	MAINTENANCE IMPROPER OR FAULTY
247	INSTALLED/ASSEMBLED IMPROPERLY
248	PROOF TEST/PROOFLOAD OVERDUE
249	HYDROSTAT OVERDUE
250	CALIBRATION OVERDUE
251	CALIBRATION FAULTY
252	CALIBRATION FAILED
255	OUTPUT INCORRECT

Code	Description
256	VALIDATION/OPERATIONAL CHECK (PM) OVERDUE
290	DIAGNOSTIC/AUTOMATIC TEST FAILURE
334	TEMPERATURE INCORRECT
350	INSULATION (THERMAL) FAULTY
373	VALVE CRACK/RESEAT FAULTY
381	LEAKING, INTERNAL OR EXTERNAL
425	NICKED
426	POWER SUPPLY/SOURCE FAULTY
427	PATCH FAULTY (ELECTRONIC)
428	STATIC DISCHARGE (INADVERTENT)
429	DATA BUSS FAULTY
430	AMPLIFIER FAULTY
431	INSERT DAMAGE
432	EDGE MEMBER FAULTY
433	SCREED FAULTY
434	LENS DEFECTIVE
435	CRYSTAL DEFECTIVE
436	FLOW RESTRICTOR FAULTY
437	OPTION PLANE FAULTY
438	CONTROLLER FAULTY
439	SENSOR FAULTY
440	FRETTING
441	HORSE COLLAR FAULTY
442	NUT PLATE DEFECTIVE
443	HYDRAULIC FLUID SEEPAGE
447	LOGIC WRONG
455	PRINTED CIRCUIT BOARD ASSEMBLY FAULTY
472	FUSE/CIRCUIT PROTECTOR DEFECTIVE
518	ROUTING IMPROPER
520	PITTED
525	PRESSURE INCORRECT
561	UNADJUSTABLE
567	RESISTANCE INCORRECT
585	SHEARED
602	FAILED OR DAMAGED DUE TO MALFUNCTION OF ASSOCIATED EQUIPMENT OR ITEM
615	SHORTED
622	WET/CONDENSATION
623	TRANSMITTER FAULTY
624	RECEIVER FAULTY
629	RELAY MALFUNCTION
632	EXPENDED
665	TENSION INCORRECT
670	S/W COMPILER FUNCTION INCORRECT
671	S/W UNACCEPTABLE CONFIGURE ERROR
672	S/W CODE LOGIC PROBLEM
673	S/W DATA BASE INCORRECTLY CONFIGURED
679	S/W DOES NOT MEET REQUIREMENTS
680	S/W REQUIREMENTS INCORRECT
681	S/W DOES NOT MEET SPECIFICATIONS
682	S/W SPECIFICATION INCORRECT

Code	Description
683	S/W USER GUIDE INCORRECT
684	S/W OPERATING SYSTEM PROBLEM
685	ADDRESS INCORRECT
690	VIBRATION EXCESSIVE
692	VIDEO FAULTY
693	AUDIO FAULTY
695	SYNC ABSENT OF INCORRECT
697	TAPE, PROGRAM, OR CHECKOUT FAULTY
698	CARD, PROGRAM, OR CHECKOUT FAULTY
710	BEARING FAILURE OR FAULTY
730	LOOSE
748	FREQUENCY ERRATIC OF INCORRECT
750	MISSING
751	LOST
752	FOUND
780	BENT, BUCKLED, COLLAPSED, DENTED, DISTORTED, OR TWISTED
782	TIRE DEFECTIVE
799	NO DEFECT
806	INTEGRITY CONTROL SEAL HAS UNAUTHORIZED BREAK OR MISSING
820	OBSOLETE/EXCESS
846	DELAMINATED/DEBONDED
847	CRUSHED FOAM
849	RAISED METAL/SURFACE
850	FILLER BAR OVERHEATED/DEFECTIVE
851	PART SHORTAGE TRANSFERRED (USE WITH RAMA ONLY)
852	OPEN WORK TRANSFERRED (USE WITH RAMA ONLY)
853	SPECIFICATION VIOLATION
854	SIP DEFECTIVE
855	FILTER DEFECTIVE
856	HEAD DEFECTIVE
857	MODULE DEFECTIVE
858	TRANSDUCER DEFECTIVE
859	RESISTOR DEFECTIVE
860	REGULATOR DEFECTIVE
861	OSCILLATION FAULTY
862	LED DEFECTIVE
863	SOLENOID DEFECTIVE
865	PROTECTOVE COATING/SEALANT DEFECTIVE
900	BURNED OR OVERHEATED
901	INTERMITTENT
902	SLUMPED TILE
903	REPAIR DETERIORATED
904	TOLERANCE REQUIREMENT NOT MET (PHYSICAL)
910	CHIPPED
916	SUSPECT PROBLEM, IMPENDING OR INCIPIENT FAILURE INDICATED BY ANALYSIS
931	ACCIDENTAL OR INADVERTENT OPERATION, RELEASE, OR ACTIVATION
935	SCRATCHED OR SCORED
936	IDENTIFICATION MISSING OR ERRONEOUS
939	PROGRAM LOADING NOT POSSIBLE
940	COMPUTER SOFTWARE ERROR

Code	Description
943	DATA ERROR
944	PARITY ERROR
946	PRINTOUT INCORRECT OR MISSING
947	TORN
948	BARE METAL
949	COMPUTER BIT/WORD LOCK UNATTAINED
952	SOLID PROPELLANT TO LINER OR CASE SEPARATION
954	SOLID PROPELLANT DEFECT
956	COMPUTER EQUIPMENT MALFUNCTION
958	DISPLAY INCORRECT
965	WELD/BRAZE DEFECTIVE
966	RF WINDOW SUCK-IN, BROKEN, OR CRACKED
986	PULSE INCORRECT/DISTORTION
988	VACUUM INCORRECT
998	INSPECTION BYPASSED

Table 1-17 How Malfunction Code Values Table

Code	Description
1	STANDARD REPAIR
2	REPAIR (MATERIAL REVIEW)
3	REMOVE & REPLACE
4	REWORK TO DRAWING/SPECIFICATION
5	CLEAN
6	ADJUST
7	CALIBRATE/PROOFLOAD/HYDROSTAT/VALIDATION
8	RETEST/REVERIFY ONLY
9	USE AS IS (MATERIAL REVIEW)
A	SCRAP
B	SEND TO VENDOR/RESPONSIBLE ORGANIZATION
C	REWORKED BY REPLACEMENT OF SUBCOMPONENTS
D	ENGINEERING CHANGE
E	WAIVER/DEVIATION/EXCEPTION
F	REVISE CODE/SOFTWARE
G	RECOMPILE
H	REPLACE/RECOPY MEDIA
J	REVISE DOCUMENTATION/REQUIREMENT
K	NO ACTION TAKEN
L	RELOAD SOFTWARE
M	MAINTENANCE PERFORMED
N	EXTEND SHELF LIFE/DUE DATE
P	REPLENISH FLUID/GAS
Q	DOWNGRADE TO TEST/TRAINING/NON-FLIGHT USE ONLY
R	SUBSTANTIATE/VERIFY/ATTACH IDENTIFICATION (ID)/DOCUMENTATION
S	SPECIAL/ADMINISTRATIVE CLOSURE
T	TRANSFER TO OTHER CONTRACTOR
V	VOID OR REDUNDANT/DUPLICATE
W	WORKMANSHIP/PROCEDURE REINFORCED
X	PUT IN UNSERVICEABLE HOLD (FOR LOGISTICS ASSESSMENT)
Y	PROBLEM UNRESOLVED-ADDITIONAL REPORT ORIGINATED
Z	TRANSFERRED TO ANOTHER WAD

Table 1-18 Disposition Code Vales Table

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APPENDIX C - Data Elements

Definitions of data elements:

Data Field	M/O[1]	Key[2]	Edit	Copy Select	Interdependencies	Validity Checks	Ad-Hoc Query	Level S/M/F[3]	Char. Length	Link to Appl	Time Edit	Default
					Problem Identification Report Fields							
ISS PDS Problem No.	M	System	-	-	-	-	Y	S	5	-	Y	
Unique system generated problem number.												
Local Problem Number	M	AN	N	Y	N	N	Y	S	20	N/A	N	
Nonconformance report number or system generated number used for traceability of the problem to a nonconformance reporting system.												
Initiator Name	M	A	N	Y	N	Y	Y	S	25	N/A	N	
Individual submitting the problem identification report.												
Signature Title	O		N	N	N	N	N		25	N/A	N	
Organization submitting the problem identification report.												
Initiating Organization	M	Table	N	Y	N	Y	Y	S	10	N/A	N	
Organization submitting the problem identification report.												
Initiator E-mail	M	AN	N	N	N	N	N	F	25	N/A	N	
E-mail of initiating individual												
Initiator Phone	M	AN	N	Y	N	Y	N	F	21	N/A	N	
Phone Number of initiating individual												
Logistics Control Number	M	AN	Y	Y	N	Y	Y	F	10	N/A	N	
Number used for tracking hardware usage by logistics.												
Problem Title	M	AN	Y	Y	N	Y	Y	S	100	N/A	N	
One line summary of the problem.												
Detected Date/Time	M	AN	Y	N	N	Y	N	M	DATE	N/A	N	
Date/time that the nonconformance was detected or entered on a nonconformance tag.												
Detected During	M	AN	Y	Y	N	Y	Y	M	32	N/A	N	
Document type and number describing the operation being performed when the nonconformance was discovered (i.e., Test Procedure X, Operation Z, etc.)												
Test/Operation Code	M	Table	Y	Y	N	Y	Y	M	3	N/A	N	
Code identifying the type of test/operation at the time of problem detection.												
PR Level Status	M	Y/N	Y	Y	N	N	Y	S	1	N/A	Y	Level 2

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Data Field	M/O[1]	Key[2]	Edit	Copy Select	Interdependencies	Validity Checks	Ad-Hoc Query	Level S/M/F[3]	Char. Length	Link to Appl	Time Edit	Default
Problem Identification Report Fields												
Level 1 or Level 2 problem report. (Defaults to Level 2 status)												
Indenture Level	M	Table	Y	Y	N	Y	Y	S	1	N/A	N	
Indicates the indenture level of the part identified.												
ORU/LRU Name	M	AN	Y	Y	N	Y	Y	S	60	N/A	N	
The ISS part name of the identified hardware												
ORU/LRU Part Number	M	AN	Y	Y	N	Y	Y	S	40	VMDB	N	
The ISS part number of the identified hardware.												
ORU/LRU Serial/Lot No.	M	AN	Y	N	N	Y	Y	S	20	N/A	N	
The serial or lot number of the identified hardware.												
Impacted Flight Event	M	Table	Y	Y	N	Y	Y	S	25	VMDB	N	
The first flight launch for which the reported problem could be expected to impact.												
SRU Adverse Trend Indicator	M	Y/N	Y	Y	N	Y	Y	S	1	N/A	N	
Indicates whether the reported problem is the result of an adverse trend that has been detected for hardware at the SRU level.												
SRU Name	O	AN	Y	Y	Y	N	Y	S	60	N/A	N	
Name of the identified part whose indenture is at the SRU level.												
SRU Part Number	O	AN	Y	Y	Y	N	Y	S	40	VMDB	N	
The ISS part number of the identified hardware.												
SRU Serial/Lot No.	O	AN	Y	N	Y	N	Y	S	20	N/A	N	
The serial or lot number of the identified hardware.												
Next Higher Assembly Name	M	AN	Y	Y	N	Y	Y	F	60	N/A	N	
The name of the particular NHA containing the reported part.												
Next Higher Assembly ID Number	M	AN	Y	Y	N	Y	Y	F	40	N/A	N	
The ISS part number of the identified NHA.												
Distributed System Name	M	Table	Y	Y	N	Y	Y	M	10	VMDB	N	
ISSP Distributed System Name per VMDB listing.												
Distributed Subsystem Name	M	Table	Y	Y	N	Y	Y	M	10	VMDB	N	
ISSP Distributed Subsystem Name per VMDB listing.												
Flight Element Code	M	Table	Y	Y	N	Y	Y	M	5	VMDB	N	
A code which consists of an abbreviated name for the flight element.												
Site Location	M	Table	Y	Y	N	Y	Y	S	30	N/A	N	
Site at which the problem was detected.												
Reportable Problem	M	Table	Y	Y	N	Y	Y	S	2	N/A	N	

Problem Identification Report Fields											
Data Field	M/O[1]	Key[2]	Edit	Copy Select	Interdependencies	Validity Checks	Ad-Hoc Query	Level S/M/F[3]	Char. Length	Link to Appl	Time Edit	Default
Definition												
	Code for type of reportable problem in accordance with SSP 30223, Section 3.2.2, Revision G.											
Fracture Critical Indicator	M	Y/N	Y	Y	N	Y	Y	S	1	N/A	N	N
	Is the identified part a fracture critical part? (Yes/No) Defaults to No.											
Reportable Problem Description	M	ANU	Y	Y	N	Y	Y	S	U	N/A	Y	
	Concise description of the problem to include information which assists in the problem identification, such as symptoms of failure, built-in-test indications, (i.e., what happened) to include comparison of expected events and/or results versus actual events and/or results. This is a scrolling field with each entry being date stamped and permanently retained with the logical record.											

Problem Resolution Report											
Data Field	M/O[2]	Key[2]	Edit	Copy Select	Interdependencies	Validity Checks	Ad-Hoc Query	Level S/M/F[3]	Char. Length	Link to Appl	Time Edit	Default
Assigned to Name	M	AN	Y	Y	N	Y	Y	S	25	N/A	N	
	Individual to which the problem report has been assigned to as the point of contact for problem resolution.											
Responsible Organization	M	Table	Y	Y	N	Y	Y	S	10	N/A	N	
	Organization responsible for disposition and resolution of the reported problem.											
Assigned to Phone	M	AN	Y	Y	N	N	N	F	21	N/A	N	
	Phone number of the responsible individual.											
Status	M	Table	Y	N	N	N	Y	S	2	N/A	Y	Open
	Status of problem (e.g., Open, Closed, etc.) (Defaults to Open)											
Manufacturer Name	M	Table	Y	Y	N	N	Y	F	45	VMDB	N	
	Manufacturer, vendor, or developer name.											
Manufacturer Cage Code	M	Table	Y	Y	Y	N	Y	F	6	VMDB	N	
	Manufacturer, vendor, or developer cage code.											
ORU/LRU/SRU PRACA Failure Mode Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
	Code identifying the failure mode of the problem as a post-analysis entry by problem resolution team.											
ORU/LRU/SRU Defect Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
	Code describing the classification of the problem responsible for the failure mode or characterization of the unsatisfactory condition.											

Problem Resolution Report											
Data Field	M/ O[2]	Key[2]	Edit	Copy Select	Interdependencies	Validity Checks	Ad-Hoc Query	Level S/M/F[3]	Char. Length	Link to Appl	Time Edit	Default
ORU/LRU/SRU Material Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code describing the classification of the hardware material responsible for the failure mode or characterization of the unsatisfactory condition.												
ORU/LRU/SRU Cause Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code identifying the event or series of events occurring at the lowest level of assembly which is directly responsible for the problem from a post-analysis entry by the problem resolution team.												
Nonconforming Article (NCA) Name	M	AN	Y	Y	N	N	Y	M	60	N/A	N	
Nonconforming Article - Lowest-level traceable defective part. Name of the actual part that failed or caused failure.												
NCA Part Number	M	AN	Y	Y	N	N	Y	M	40	VMDB	N	
Part number of NCA.												
NCA Serial/Lot Number	M	AN	Y	N	N	N	Y	M	20	N/A	N	
Serial or lot number of NCA.												
NCA Failure Mode Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code identifying the failure mode of the NCA as a post-analysis entry by problem resolution team.												
NCA Defect Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code describing the classification of the NCA responsible for the failure mode or characterization of the unsatisfactory condition.												
NCA Material Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code describing the classification of the NCA material responsible for the failure mode or characterization of the unsatisfactory condition.												
NCA Cause Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code identifying the event or series of events occurring at the lowest level of assembly for the NCA which is directly responsible for the problem from a post-analysis entry by the problem resolution team.												
Linked-to-PR	O	List	Y	N	N	N	N	S	-	N/A	N	
Identifies the parent problem report to which the problem report is linked.												
Referenced PR Numbers	O	System	-	-	Y	-	-	S	-	-	-	
Identifies the child problem reports that are linked to the problem report.												
FMEA Criticality Code	M	Table	Y	Y	N	Y	Y	S	3	N/A	N	
Identification of the criticality for the worst case effect associated with the FMEA worksheets associated with the problem.												
FMEA Number	O	AN	Y	Y	N	N	Y	F	40	VMDB	N	
Unique FMEA worksheet number which identifies the hardware item and specific failure mode being analyzed.												

Data Field	M/O[2]	Key[2]	Edit	Copy Select	Interdependencies	Validity Checks	Ad-Hoc Query	Level S/M/F[3]	Char. Length	Link to Appl	Time Edit	Default
Problem Resolution Report												
Action Item Narrative	O	ANU	Y	N	N	N	N	S	U	N/A	Y	
Narrative documenting specific actions that must be completed prior to resolution and closure of the problem report. This is a scrolling field with each entry being date stamped and permanently retained with the logical record.												
Cause/Investigation Summary	M	ANU	Y	Y	N	N	Y	S	U	N/A	Y	
Documentation of investigation results should include related problems, problem history, generic impacts, and failure analysis results. This is a scrolling field with each entry being date stamped and permanently retained with the logical record.												
Corrective Action/Recurrence Control Narrative	M	ANU	Y	Y	N	N	Y	S	U	N/A	Y	
Documentation of corrective actions taken and recurrence controls used to prevent or mitigate the recurrence of the problem. This is a scrolling field with each entry being date stamped and permanently retained with the logical record.												
Recurrence Control Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code identifying the primary method to prevent recurrence of the problem.												
How Malfunction Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code identifying how a malfunction occurred.												
Disposition Code	M	Table	Y	Y	N	N	Y	M	3	N/A	N	
Code identifying the disposition of a problem.												
Wavier/Deviation Number	O	AN	Y	Y	N	N	Y	M	20	N/A	N	
Waiver or deviation number (ISSP Number) required to close out the reportable problem or the nonconformance report.												
Prevailing Condition Code	M	Table	Y	Y	N	N	Y	F	2	N/A	N	
Environment type when detected.												
Limited Life Indicator	O	Y/N	Y	Y	N	N	Y	F	1	N/A	N	
Yes/No (Defaults to N)												
Limited Life Explanation	O	ANU	Y	Y	Y	N	Y	F	U	N/A	Y	
Description of Limited Life consideration.												
Operating Times/Cycles	O	N	Y	N	Y	N	N	F	10	N/A	N	
Time/cycle reading or estimate.												
Operating Times/Cycles Units	O	AN	Y	Y	Y	N	N	F	1	N/A	N	
Units for which the times/cycles are recorded.												
In-Flight Anomaly (IFA) Problem Number	O	AN	Y	Y	N	N	Y	S	5	N/A	N	
Unique number identifying the IFA for which the problem report is associated.												
CHIT Number	O	AN	Y	Y	N	N	Y	S	5	N/A	N	

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Problem Resolution Report											
Data Field	M/ O[2]	Key[2]	Edit	Copy Select	Interdependencies	Validity Checks	Ad-Hoc Query	Level S/M/F[3]	Char. Length	Link to Appl	Time Edit	Default
Unique number identifying the CHIT for which the problem report is associated.												
IFA/CHIT Notes	O	ANU	Y	Y	Y	N	Y	S	U	N/A	Y	
Concise notes of relevant information describing the on-orbit conditions, activities, operations, etc. to support problem resolution. This is a scrolling field with each entry being date stamped and permanently retained with the logical record.												
Signatures	-	System	-	-	-	-	-	F	-	-	Y	
System generated listing the close out signatures input to the PDS for problem report closure.												
Related Document(s)	-	System	-	-	-	-	-	F	-	PALS	N	
Reference to documents (waivers, alerts, SCANs, etc.) associated with the identification or resolution of the problem.												

APPENDIX D - <u>Interface Control Descriptions</u>

Description of the interface controls for the following systems:

5. INTERFACE CONTROL DESCRIPTIONS

5.1 VMDB

5.1.1 ORU/LRU PART NUMBER

5.1.2 SRU PART NUMBER

5.1.3 NCA PART NUMBER

5.1.4 FMEA NUMBER

5.1.5 IMPACTED FLIGHT EVENT

5.1.6 DISTRIBUTED SYSTEM NAME

5.1.7 DISTRIBUTED SUBSYSTEM NAME

5.1.8 FLIGHT ELEMENT CODE

5.1.9 MANUFACTURER NAME

5.1.10 MANUFACTURER CAGE CODE

5.1.11 TO VMDB

5.2 PALS

5.2.1 RELATED DOCUMENT

5.3 Other - Other application interfaces - TBD.

APPENDIX E - <u>Reports</u>

6. CREATE THE FOLLOWING REPORTS:

<u>Note: All reports shall have a system date in the upper right hand corner which indicates the date the report was run.</u>

6.1   Summary Statistics by Flight report

Provide the capability of downloading said report as a .csv file to be opened <u>directly</u> in Excel. The report will contain a count of Total PRs, Total Open, Open, Dispositioned, Closed, Level 1, and Level 2 Problem Reports. Report will be sorted by Responsible Organization with a secondary sort by subsystem. Fields to be included are: PR#, Status, Open Date, Close Date, Element, Subsystem, Boeing S&MA, Boeing Engineering, NASA S&MA, NASA Engineering, Boeing S&MA, Boeing Engineering, NASA S&MA, NASA Engineering, NASA DCB, Tag No., Problem Title. After being grouped by flight, report should be sorted in the following order: by status (with closed statuses at the bottom), by subsystem, and by PR number. Users should be able to select report on one specific flight or all.

6.2   Executive Summary Statistics By Flight

Provide a summary report which includes the following Grand Total counts: Total PR, Total Open, Open, Dispositioned, Closed, Level 1, Level 2 for each Responsible Organization.

6.3   Summary Statistics

Provide a summary report grouped by responsible organization and then status that includes the following fields: Responsible Organization, Status, and Count.

6.4   PDS Users by Organization

Provide a report that displays the following fields: Responsible Organization, Name, and Account. Sort by Responsible Organization and then by Name.

6.5   PRs by Flight Element Code

Provide a report that displays the following fields: Flight Element, System, Responsible Organization, PR #, Title. Sort by Flight Element and then by System.

6.6 (This is the same as 6.3)

6.7 Summary Reports

6.7.1 ALL PROBLEMS

Provide a summary report that displays the following fields for all PRACA problems: Problem #, Responsible Organization, Status, Signatures Completed/Required, Open date/Close date, Title. Sort by PR #.

6.7.2 BY RESPONSIBLE ORGANIZATION

Provide a report that displays the following fields: Status, Subsystem, Problem #, Signatures Completed/Required, Last Released, Title. Group by Responsible Organization. Provide capability for user to specify one specific responsible orqanization or all organizations. Include sub-total counts of Total PRs, Total Open, and Total Closed for each responsible organization and a grand total at the end of the report.

6.7.3 BY FLIGHT

Provide a report that displays the following fields: Status, Responsible Organization, Problem #, Signatures Completed/Required, Element Code, and Title. Group by Flight. Provide capability for user to specify one specific flight or all flights. Include sub-total counts of Total Prs, Total Open, and Total Closed for each flight and a grand total at the end of the report.

6.7.4 BY SYSTEM

Provide a report that displays the following fields: Subsystem, Status, Responsible Organization, Problem #, Signatures Completed/Required, Title. Group by System, Subsystem, and finally Problem #. Provide capability for user to specify one specific system or all systems. Include sub-total counts of Total Prs, Total Open, and Total Closed for each system and a grand total at the end of the report.

6.7.5 BY SUBSYSTEM

Provide a report that displays the following fields: Status, Responsible Organization, Problem #, Signatures Completed/Required, Title. Group by Subsystem   Provide capability for user to specify one specific subsystem or all subsystems. Include sub-total counts of Total Prs, Total Open, and Total Closed for each subsystem and a grand total at the end of the report.
.

6.7.6 CUSTOMIZED REPORT

Provide a report that allows the user to define a set of variables which include: Responsible Organization, Problem Status, Subsystem, and System Level. User should be able to select variables from a drop down list. Report should display Problem # and Problem Title.

6.7.7 ADHOC QUERY

Provide a report that allows the user to set criteria in any field of the Initial or Resolution form. Date criteria should include the "less than", "greater than", "between" operations.

6.8 Summary Statistics by Subsystem

Provide capability for the Summary Statistics by Subsystem report to be downloaded as a .csv file and opened directly in Excel. Provide a Summary Statistics by Subsystem report which includes the following fields: PR#, Status, Open Date, Close Date, Flight, Location , Boeing S&MA, Boeing Engineering, NASA S&MA, NASA Engineering, Boeing S&MA, Boeing Engineering, NASA S&MA, NASA Engineering, NASA DCB, Tag No., Problem Title, grouped by Subsystem.. Report should also display total counts by : Total PR, Total Open, Open, Dispositioned, Closed, Level 1, Level 2. After being grouped by Subsystem, report should be sorted in the

following order: by status (with closed statuses at the bottom), by flight, and by PR number. Users should be able to select report on one specific subsystem or all subsystems.

6.9 Executive Summary Statistics by Subsystem

 Provide a summary report which includes the following Grand Total counts: Total PR, Total Open, Open, Dispositioned, Closed, Level 1, Level 2 for each Subsystem.

6.10 Non-Closed Problem Report(s) - Aging Metric

Provide aging metric reports based on non-closed Problem Reports. These report should be graphical bar charts showing number of non-closed PRs aged less than 30 days, 30-59 days, 60-89 days, 90-120 days and over 120 days. Users should have the opportunity to select one parameter for the report. Those parameters should include Responsible Organization, Flight, System, and Subsystem. They should also be able to generate a report showing all non-closed Problem Reports.