Work Instruction (WI)

DIRECTIVE NO.	322-WI-8270.0.3	**APPROVED BY Signature:**	*Original Sign By*
EFFECTIVE DATE:	October 7, 2010	**NAME:**	Anthony J. DiVenti
EXPIRATION DATE:	October 7, 2015	**TITLE:**	Chief, Reliability and Risk Analysis Branch

COMPLIANCE IS MANDATORY

Responsible Office: 322 / Reliability and Risk Analysis Branch

Title: Project Reliability Program Plan/Probabilistic Risk Assessment Plan Preparation (RPP/PRAP)

PREFACE

P.1 PURPOSE

This document establishes the process for the preparation, documentation, and approval of a project Reliability Program Plan (RPP)/Probabilistic Risk Assessment Analysis Plan (PRAP) document(s). These documents may be separate or integrated into one document.

P.2 APPLICABILITY

This work instruction applies to Code 322 Reliability Engineers developing or revising project RPP/PRAP document(s).

P.3 REFERENCES

a. NPR 8705.4, Risk Classification for NASA Payloads
b. NPR 8705.5, Technical Probabilistic Risk Assessment (PRA) Procedures for Safety and Mission Success for NASA Programs and Projects
c. MIL-STD-785,Reliability Program for Systems and Equipment Development and Production,
d. NASA Probabilistic Risk Assessment Procedures Guide for NASA Managers and Practitioners, Version 1.1.
e. 320-MAR-1001, Standard Mission Assurance Requirements

P.4 CANCELLATION

None

P.5 TOOLS, EQUIPMENT, AND MATERIALS

None

P.6 SAFETY PRECAUTIONS AND WARNINGS

None

P.7 TRAINING

None

P.8 RECORDS

Record Title	Record Custodian	Retention
Project RPP	Original: Project Office (Copy to: 322 Administrator)	* NRRS 8/103 temporary. Destroy/delete between 5 and 30 years after program/project termination.
Project PRAP	Original: Project Office (Copy to: 322 Administrator)	* NRRS 8/103 temporary. Destroy/delete between 5 and 30 years after program/project termination.

P.9 MEASUREMENT/VERIFICATION

None

INSTRUCTIONS

In this document, a requirement is identified by "shall," a good practice by "should," permission by "may" or "can," expectation by "will," and descriptive material by "is."

1. General
   The Reliability Engineer shall develop/integrate plan(s) for performing Reliability and Risk Assessment activities for a given Goddard Program/Project.
   a. The plan(s) shall identify the tasks to be performed, describe how the tasks will be implemented, and establish controls to help ensure activities are implemented as planned.
   b. The plan(s) shall discuss the scheduling of tasks relative to project milestones and identify responsibilities of all participants.
   c. The plan(s) shall describe the activities that ensure that reliability functions are an integral part of the design and development process and interact effectively with other project disciplines, including systems engineering, hardware design and product assurance.
   d. The plan(s) shall describe how reliability analyses will be integrated with the design process and other assurance practices to maximize the probability of meeting mission success criteria.
   e. The Reliability Program Plan (RPP) shall be based on MIL-STD-785 with modifications where necessary to account for any differences between military and NASA Programs (e.g., NASA NPR 8705.4 Risk Classification for NASA Payloads).
   f. NPR 8705.5 is the primary document that delineates Probabilistic Risk Assessment (PRA) planning requirements. The Probabilistic Risk Assessment Plan (PRAP) shall be based on NPR 8705.5 Probabilistic Risk Assessment (PRA) Procedures for NASA Programs and Projects.

2. Project RPP/PRAP
   a. The Reliability Engineer shall develop a project Reliability Program Plan/Probabilistic Risk Analysis Plan using 322-RPP-1001, the Standard Reliability Program Plan/Probabilistic Risk Analysis Plan (SRPP/SPRAP) and requirements from the Project Mission Assurance Requirements (MAR) document.
   b. The Reliability Engineer shall tailor the contents from all sections of the SRPP/SPRAP by the Class of Mission and the Project MAR in the draft project RPP/PRAP.

3. Reliability Requirements
   a. The baseline set of reliability task requirements are contained in 322-RPP-1001 (SRPP/SPRAP) and the Project MAR document. This SRPP/SPRAP includes the required tasks, recommended schedules, acronym list, reliability performance requirements, and tailoring table. The tailoring table contains information related to changes in requirements for various mission classifications. The Project MAR contains specific Reliability requirements for the project.

4. PRA Requirements

a. In accordance with NPR 8705.5: The PRA planning document shall contain the following elements:
    i. The plan shall be developed in conjunction with the Program/Project Manager. With the Program/Project Manager, a decision shall be made as to whether a PRA is required or not. (Note: NPR 8705.5 states that all Class A and/or Category 1 programs/projects shall have a PRA conducted. Other programs/projects may elect not to perform PRA. In these cases, the Program/Project shall (by working with their Mission Assurance [Code 300] counterparts) obtain concurrence from the SMA Technical Authority at HQ. Appropriate rationale shall be documented as to why such a decision was made.
    ii. When a PRA is being performed, a plan shall be developed to:
        1. Define the objective(s) of the PRA and its intended applications to support decisions and technical reviews for selected life-cycle phases
        2. Define the uses (and life-cycle phases) that are supported by a PRA
        3. Describe the scope and level of detail of the PRA, including the identification of end-states (undesirable consequences, performance measures, figures of merit) of interest, which are consistent with the PRA objectives and applications
        4. Define the quantitative performance measures and numerical criteria that are evaluated by the PRA consistent with the objectives and application
        5. Develop a PRA schedule compatible with the objectives, applications, and life-cycle phases identified by the program/project manager
        6. Define how internal reviews will be conducted in order to enhance the PRA's quality and credibility, and to assure consistency with the requirements of NPR 8705.5 and the PRA plan.
        7. Address that all PRA inputs, products, models, analyses, and documentation are made readily available for Independent Peer Reviews consistent with the objectives and applications defined in the approved PRA plan.

5. Review of the RPP/PRAP

    a. A Code 322 peer review of the RPP/PRAP shall be performed before submittal to the CSO and project.

6. RPP/PRAP Revisions

    a. The Reliability Engineer shall periodically (nominally once each quarter) assess the RPP for adequacy to address project or program requirements.
        i. Necessary revisions shall be generated to address any deficiencies or changes in scope or requirements.
        ii. Decisions to not change the RPP shall be documented to maintain a record of currency for each RPP.

b. The Reliability Engineer shall submit revisions to the approved RPP to Reliability and Risk Assessment Branch management for approval prior to submitting such revisions to the program or project office.

Appendix A – Definitions

None

Appendix B – Acronyms

CSO	Chief Safety & Mission Assurance Officer
MAR	Mission Assurance Requirements Document
PRA	Probabilistic Risk Assessment
PRAP	Probabilistic Risk Assessment Analysis Plan
RPP	Reliability Program Plan
SPRAP	Standard Probabilistic Risk Assessment Analysis Plan
SRPP	Standard Reliability Program Plan

CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline	10/07/2010	Initial Release