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John C. Stennis Space Center
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SPR 7120.1 Rev D
January 2022

John C. Stennis Space Center

Risk Management Procedural Requirements

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Basic-1	October 27, 2004	Renay Nelson/X81585	Revalidated per NASA Rules Review.
Revision A	12/15/08	Buddy Newbold x 8-3152	Complete revision to basic document to implement Integrated Risk Management and provide framework that integrates risk-informed decision making and risk-management process within the organizational structure of the Center.
Revision A-1	October 2010	Mike Rewis 8- 2663	Changed all references of acronym for the responsible Office from S&MA to SMA. Corrected typographical and grammatical errors throughout document. Updated Center Director signature block. Updated Appendix C. Removed Appendix E.
Revision B	May 2014	Kimberly R. Johnson 8-3297	Updated risk management procedure to include new methodology which ranks active risks to provide numerical fidelity and assist in the Executive decision-making process. Appendices have been updated to reflect correct use and document flow. Administrative corrections (MRW).
Revision C	June 2016	Kamili M.J. Shaw 8-3025	Updated 1.5, Risk Reporting, to add detail to the heuristic analysis. Replaced IRMA with "central risk management database" throughout. Replaced center watch item or list with medium risks throughout. Deleted Appendix F, SSC RISK TRAINING.
Revision D	January 2022	Kamili M.J. Shaw, Mike Rewis 8-3025	P.2 Defined institutional risks. P.4 Added directorate and organizational risk management plans.

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			<p>Overall changed “concern” or “candidate” to “draft risk” and Probability Impact Diagram to scorecard.</p> <p>1.2 Retitled section 1.2 to be more in line with it’s content.</p> <p>2.6 Added the responsibility for providing risk process guidance and approving risk state transitions.</p> <p>2.7 Added responsibilities for Supervisors, Managers, and Project Managers.</p> <p>3.1 Moved risk reporting to this section from 1.5 and reworded it to better reflect current process.</p> <p>3.3 Added a heuristic analysis section.</p> <p>Appendix B. Added, deleted and reworded definitions to be consistent with changes in the rest of the document.</p> <p>Appendix C. Updated process flow to include research and changed candidate/concern to draft risk</p> <p>Appendic D. Updated the SSC scorecards to those agreed to by the RRP on 4/2019.</p>
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PREFACE

P.1 PURPOSE

- a. This Stennis Procedural Requirement (SPR) implements the requirements for Integrated Risk Management (RM) for John C. Stennis Space Center (SSC), its directorates/offices, and its programs and projects. Defining a tailored RM process that integrates Risk-Informed Decision Making (RIDM) and Continuous Risk Management (CRM) for SSC is the principle purpose of this document.
- b. The purpose of addressing RM at the Center-level is to ensure all risks are identified, captured, and communicated in a common way across the Center. The Integrated RM process set forth in this document provides bottom-up, detailed, continuous assessment of risk; provides support for the identification and mitigation of institutional risks; and integrates RM activities within the SSC organizational structure across the Center and supports RIDM capabilities Center-wide.

P.2 APPLICABILITY

- a. This SPR applies to all SSC directorates and mission support offices.
- b. This SPR applies to NASA SSC contractors to the extent specified by their respective contracts.
- c. For NASA programs/projects/tasks residing at SSC, the requirements in this SPR shall be treated as additional requirements to risk identification and managing responsibilities related to specific NASA program and project goals and objectives. In particular, this document shall be the primary guidance when there is a risk that involves institutional infrastructure or resources. These risks will be referred to hereafter as institutional risks.
- d. This SPR defines the methods and the tools used in the CRM process and the practices to be used within SSC.
- e. In this SPR, a requirement is identified by “shall”; a good practice by “should”; permission by “may” or “can”; and descriptive material by “is” or “are” (or another form of the verb “to be”).

P.3 AUTHORITY

- a. NPD 1000.0, *NASA Governance and Strategic Management Handbook*
- b. NPD 1001.0, *2014 NASA Strategic Plan*

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- c. NPD 8700.1, *NASA Policy for Safety and Mission Success*
- d. NPR 8000.4, *Agency Risk Management Procedural Requirements*
- e. NPR 8820.2, *Facility Project Requirements*
- f. SPD 7120.1, *SSC Institutional Risk Management*

P.4 APPLICABLE DOCUMENTS

- a. SBCC-1150-0013, *Risk Review Panel (RRP) Charter*
- b. SCWI-8080-0001, *Propulsion Test Project Management*

P.5 MEASUREMENT/VERIFICATION

Compliance with requirements cited in this SPR will be monitored through the SSC Safety and Mission Assurance Directorate (SMA) by objective evidence tracked through:

- a. Periodic review of directorate/office level Top Risk Reports.
- b. Periodic review of directorate/office level RM and RIDM processes.

P.6 CANCELLATION

SPR 7120.1, Rev C dated June 2016.

**RICHARD
GILBRECH** Digitally signed by
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CHAPTER 1. INTRODUCTION

1.1 Integrated Risk Management at SSC

a. RM is a method of managing that concentrates on the identification and control of events that have a potential to cause an undesired impact. It is a proactive, risk-informed approach to enable and enhance the decision makers' effective selection of key decision alternatives with implementation and follow-through. In this document, RM is defined in terms of RIDM and CRM. The purpose of integrating RIDM and CRM into a coherent framework at the Center is to foster proactive RM across the Center to better inform decision making through better use of risk information.

b. This SPR implements RM using existing organizational structure and reporting. This approach leverages the NASA Strategic Management Process and assures communication across the entire Center utilizing management councils, directorate/office reviews, and a central risk management database to support RIDM. As a result, the RM process and organization directly correlate with the established organizational structure and provide a simple to use, scalable, and documented process. Utilizing a central risk management database to document and update risks allows the director/manager to create and maintain an information environment where risk information is collected in a coherent manner across the Center and can proceed up from the sub-directorate level through the directorates/offices to the Center level.

1.2 The Organizational Role in the Integrated Risk Management Process at SSC

a. The directorate/office shall provide RM organizational integration and communication.

b. Sub-directorate organizations shall be responsible for carrying out a sustained effort to implement RM and RIDM by adopting best practices within their organization to support directorate/office implementation of the requirements set forth in this document. This includes implementation of these processes for divisions within the directorate/office as well as within the established contractor reporting mechanisms for contractors supporting the mission of the directorate/office. The process is depicted in greater detail in Appendix C of this document.

1.3 Risk Informed Decision Making

a. RIDM is a deliberative process to provide risk information as an element in decision making and takes place at many different venues and many different organizational levels across the Center, including boards and panels and management reviews. RIDM provides the decision maker with an assessment of related risk to support management decisions. The ultimate decision is *informed* and not solely based upon the risk assessment information provided by the RIDM process. RIDM shall be embedded as a routine portion of leadership reviews and implemented by directorates/offices in order to support decision making at that level.

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- b. All SSC institutional risks shall be identified and entered into the central risk management database and assessed based upon likelihood and consequence utilizing the standardized SSC risk scorecard in Appendix D.
- c. Independent risk assessments may be conducted as a part of an organization’s risk-informed process utilizing appropriate analysis techniques.
- d. The results of analyses shall be documented in the central risk management database or the minutes of the RRP meetings. The analyses shall support the SSC RIDM process and shall use the standard SSC scorecard.

1.4 Continuous Risk Management

NASA uses a specific process for the management of risks. This process is referred to as CRM. All directorates/offices shall implement a CRM process aimed at identifying, analyzing, planning, tracking, controlling, communicating, and documenting risks. This process supports integration of organizational performance measures within a comprehensive decision-making framework and is complementary to those activities mentioned above. It aligns with SSC’s established reporting requirements. Coupling CRM to the decision-making processes provides the focus and accountability of RIDM. The collective benefit is a RM process that supports better decisions across the Center. A brief summary of the CRM paradigm is provided in Appendix E.

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CHAPTER 2. RISK MANAGEMENT ROLES AND RESPONSIBILITIES

2.1 John C. Stennis Space Center

SSC consists of directorates and mission support offices that support management of Center functions. Each directorate/office shall identify their organizational risks based upon performance measures and mission support requirements. Each directorate/office shall establish and implement RM and RIDM consistent with requirements set forth in this document.

2.2 Center Director

A key role of the Center Director is to support the directorate/office needs in order to fulfill the Center's role in meeting the Agency's strategic goals. Directorates/offices shall support these practices by exercising their organizational mission and responsibilities as defined by mission statements and organizational structure. The Center Director shall be responsible for management of risks at the Center. These responsibilities include:

- a. Providing appropriate levels of authority, resources and funding necessary for implementation of the SSC risk management program.
- b. Serving as the ultimate risk acceptance/disposition official for SSC organizations.
- c. Incorporating reviews of Top and Medium Center risks into recurring SSC Joint Management Council (JMC) and Center-level Review Boards, as needed, to support risk analysis of decision alternatives and assessment of organizational performance requirement baselines.

2.3 SSC Safety and Mission Assurance Directorate

SMA shall be responsible for implementing a Center-level Integrated RM program and establishing RM guidelines, processes, and common standards throughout SSC. SMA shall serve as the process owner for Integrated RM at SSC. SMA's specific responsibilities include:

- a. Providing appropriate Center-level RM and RIDM policy, guidance and expertise.
- b. Appointing a Center-level Integrated Risk Manager.
- c. Ensuring that appropriate training is available as needed on applicable RM policies, tools, and processes.
- d. Performing independent internal assessments and verification of SSC organizational elements' RM and RIDM processes as directed by the Center Director and/or the SSC JMC.

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- e. Providing RM support as necessary for communicating RM issues to organizations outside of NASA.
- f. Acting as the central risk management database configuration manager and administrator for SSC.
- g. Providing technical RM support to SSC management councils and review boards through participation in deliberations regarding RM as required and providing periodic reports on the status and results of its ongoing RM Program assessments.
- h. Providing technical RM expertise to the directorate/office's Risk Point-of-Contact (RPOC).
- i. Establishing and conducting an ongoing assessment and verification process for the SSC Integrated RM Program to monitor the wellness of the overall program.

2.4 Center Integrated Risk Manager

The Center Integrated Risk Manager shall be responsible for providing directorate/office-level RM support to planning, risk identification, risk analysis, risk tracking, risk mitigation, and reporting. Responsibilities include:

- a. Serving as the chair of the RRP.
- b. Providing RM expertise in support of RIDM and CRM process implementation and integration activities across the Center.
- c. Providing specific training on the central risk management database, SSC Integrated RM and CRM.
- d. Providing and maintaining a central risk management database to identify, track, analyze, mitigate, and report risks.
- e. Providing technical RM support to SSC JMC and Review Boards as required.
- f. Supporting the development and maintenance of the Top and Medium Center Risk Report.
- g. Providing RM expertise to directorate/office RPOC in support of organizational implementation of RM and RIDM.
- h. Ensuring RM audits of directorates/offices' RM practices and procedures are conducted for best practices and integration opportunities, and to make the results of these audits available to Center senior management.

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2.5 Directors and Office Managers

Each director/manager shall be responsible for implementing, managing, and reporting risks within their organization using the process identified in this SPR. These responsibilities include:

- a. Designating an organizational RPOC to facilitate the process and ensure compliance with SSC's Integrated RM requirements.
- b. Providing the RPOC with sufficient authority and support to represent the organization.
- c. Ensuring that risks are identified and analyzed, and that key decisions of the organization are risk informed.
- d. Managing organizational institutional risk that solely affects their sub-organizational elements.
- e. Ensuring that sub-organizational risks are identified, and that interdependencies are either managed at the current level or elevated.
- f. Assisting in the development and management of risks through participation in appropriate councils and review boards.
- g. Reporting risks to the Center Director, SSC JMC, RRP, and other review boards as required.
- h. Providing appropriate levels of authority, resources and funding necessary for implementation within their respective directorates/offices.
- i. Providing support to the RRP.
- j. Ensuring risk owners and other personnel obtain RM training, as appropriate.
- k. Ensuring the development and coordination of an internal directorate/office RM plan using the template provided in Appendix F as a guide. The director/manager or designated representative's signature is required to reflect approval. Other signatures may be added if applicable. The concurrence of the SMA Director or designee is required on all directorate/office-level plans.
- l. Ensuring risks are reviewed monthly with the aim of identifying, analyzing, tracking, controlling and documenting risks within their organization.

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2.6 Directorate/Office Organizational Risk Point-of-Contact

Each directorate/office shall assign at least one individual to serve as its RPOC with the following responsibilities:

- a. Ensuring the development, implementation, and maintenance of the organizational element's RM plan, central risk management database, RIDM and CRM processes.
- b. Maintaining cognizance of all RM issues for subordinate organizational levels and serving as the point of contact for risk issues elevated from subordinate organizational elements.
- c. Representing the organization as a member of the RRP and coordinating RM activities with SMA, SSC management councils, and review boards.
- d. Ensuring all risk-owners and other individuals who require an account in the central risk management database receive training as needed.
- e. Providing appropriate guidance on RM, RIDM, CRM and the central risk management database.
- f. Serving as approvers, and/or identify appropriate approvers, in the central risk management database with the designated leaders to change risks from one state to another state, i.e. draft to mitigating, mitigating to watching, watching to closed, etc.

2.7 Supervisors, Managers, and Project Managers

Supervisors, managers, and project managers have specific roles in the risk management process as follows:

- a. Assisting with the identification of risk within the organization.
- b. Serving as approvers, and/or identify appropriate approvers, in the central risk management database with the RPOC to change risks from one state to another state, i.e. draft to mitigating, mitigating to watching, watching to closed, etc.
- c. Assuring resources are available for RM and RIDM.

2.8 SSC Joint Management Council and Center Review Boards

- a. The responsible official (e.g., Chair, Executive Secretary) for the SSC JMC, the RRP, and other Center review boards shall establish risk communication protocols (including the frequency and content of reporting) that satisfy the needs and requirements of this document.

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The deliberative process that takes place within these forums is the central element of RIDM at the Center.

- b. This communication may be accomplished using the standard risk reports or other risk-informed communication inputs to support decision making within the specific council or review board. These processes shall be coordinated with the SSC SMA. See Appendix G for the JMC Vetting Process.

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CHAPTER 3. RISK MANAGEMENT ACTIVITIES

3.1 Risk Assessments

All SSC organizational elements shall use the SSC assessment criteria embedded in the central risk management database to support their risk assessment process and the 5x5 scorecard depicted in Appendix D. This scorecard provides a common reference framework across the Center and enables a coherent risk data comparison.

3.2 Risk Reporting

- a. Each directorate and office may identify and manage risk according to their internal plan, but all directorates and offices shall use the central risk management database to report and track risks.
- b. Risks may be handled in several different ways: watch, mitigate, research, or accept. These are called handling strategies. Risks being watched are monitored for a certain trigger that will cause the risk to change to another handling strategy or be closed. Mitigating a risk means taking action to reduce the severity of a risk, either by reducing the probability of it occurring, or by reducing the level of impact if it does occur or both. If a risk is being researched, information is being gathered to make a decision on further action. If a risk is accepted, the consequences of that risk have been accounted for with resources by the appropriate official.
- c. Directorates/offices may establish and maintain an internal top risk list. The criteria for that top risk list can be specified by the directorate/office. This criteria should be communicated to the organization through the organizational risk management plan.
- d. Each directorate/office may maintain an internal watch list. The watch list represents risks that have “watch” as a handling strategy. Normally these risks have a low likelihood or consequence or both. These risks are watched for a defined trigger that spurs additional action.
- e. Directorates/offices may establish a “draft” risk list. These draft risks were formerly considered concerns or candidate risks. Risks may stay in the draft state until they rise to the level of consideration as an organizational risk.
- f. The SMA Directorate shall maintain a Top and Medium Center Risk List. The Top Center risks and selected Medium risks shall be reported to Center senior management through the JMC quarterly. The status of the risks on the Top and Medium Center risk list shall be reviewed by the RRP and reported to Center Director and Center Deputy Director monthly.

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3.3 Heuristic Analysis

The SMA Directorate shall initiate the generation of the Top and Medium Center Risk List once a quarter. All risks in the central risk management database with a handling strategy of mitigate, research or watch will be considered for the Top and Medium Center Risk list. Draft risks and accepted risks shall not be considered. The process to initiate and finalize the list shall be as follows:

- a. The consequences of all active directorate/office risks within the central risk management database shall be rated using six (6) criteria: cost, schedule, performance, safety, duration, and SSC profile. Each criterion is rated from one (1) to five (5) based on the SSC scorecard in Appendix D. Using these criteria, one (1) value shall be calculated considering all six (6) consequence criteria from each risk and the entire risk list shall be ranked.
- b. All of the active risks shall then be plotted in descending order. Inflection points shall be determined from the list of ranked risks using cluster analysis. While the first two (2) inflection points are the most important in the risk management process, more than two (2) inflection points may be used during the analysis. The first two (2) inflection points on the generated curve bound the potential Top and Medium Risks. Specifically, the risks above the highest threshold are considered most significant and noted as potential Top Risks. The risks just beneath the highest threshold and above the second inflection point should also have increased visibility and are noted as potential Medium Risks.
- c. Upon completion of the analysis, the risks identified as potential Top and Medium Center Risks shall be presented to the RRP for evaluation and a vote. The RRP makes the final decision on which risk to present to the Center Director for concurrence. The accepted Top and Medium Center Risks shall be submitted to the Center Director for concurrence. A report of the results shall be generated after each analysis.

3.4 Risk Tracking

Each directorate/office shall track their risks in the central risk management database. The intent of risk tracking is to ensure that all risks are identified, captured, and communicated within the appropriate hierarchical units at the Center. This assures that appropriate risk information is available for decision makers at all levels to support successful risk mitigation.

3.5 Risk Mitigation Planning

- a. Risk mitigation plans shall be developed within the central risk management database and include the specifics of what should be done, when it should be accomplished, and who is responsible.

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- b. All risks rated as red or yellow shall have a mitigation plan developed and documented in the central risk management database. Each plan may have several mitigation tasks as required to adequately address the identified risk. These tasks may be assigned different parties.
- c. Organizational units should reevaluate known risks on a periodic basis. Specifically, at the successful completion of a mitigation step, the likelihood and consequence of the risk shall be adjusted accordingly. Risks on the Top and Medium Center risk list shall be evaluated monthly.

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APPENDIX A ACRONYMS

CRM	Continuous Risk Management
JMC	Joint Management Council
NODIS	NASA Online Directives Information System
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
RIDM	Risk Informed Decision Making
RM	Risk Management
RPOC	Risk Point-of-Contact
RRP	Risk Review Panel
SBCC	Stennis Boards, Councils and Committees
SCWI	Stennis Common Work Instruction
SMA	Safety and Mission Assurance Directorate
SSC	John C. Stennis Space Center
SPD	Stennis Policy Directive
SPR	Stennis Procedural Requirements
TechDoc	NASA/SSC Technical Documentation System

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APPENDIX B DEFINITIONS

Word	Definition
Accepted Risk	A risk whose consequences have been accounted for by resources and, should they occur, have determined by the appropriate authority to be acceptable without further mitigation.
Asset	An element of the organizational office (this is usually a specific project or a specific portion of a project and may be seen as similar to a portion of a WBS). It represents the primary resource that is affected by the individual risk.
Candidate Risk	See draft risk.
Closed Risk	A risk that has been fully mitigated, has turned into a problem or can no longer be realized.
Concern	See draft risk.
Condition	A single phrase that describes the current key fact-based situation or environment that is causing concern, doubt, anxiety, or uneasiness. The fact-based aspect of the CONDITION helps to ground the individual risk in reality, in order to prevent the risk database from becoming a repository for purely speculative concerns. The CONDITION represents evidence in support of the concern that can be independently evaluated by risk management personnel and which may be of value in determining an appropriate risk management response during the Plan step.
Consequence	An assessment of the credible, potential impact/result(s) of a risk. It is the part of the risk statement that focuses on the intermediate and long-term impact of a risk and describes the key, negative outcome(s) of the current conditions. It is a single phrase that describes the foreseeable, credible negative impact(s) on the organizational unit's ability to meet its performance requirements. It should describe the impact(s) in terms of failure to meet requirements that can be measured, described, and characterized.
Continuous Risk Management (CRM)	The process that identifies risks; analyzes their impact and prioritizes them; develops and carries out plans for risk mitigation or acceptance; tracks risk and the implementation of plans; supports informed, timely, and effective decisions to control risks and mitigation plans; and assures that risk information is communicated and documented.
Departure	Describes a possible change from the baseline project plan. It is an undesired event that is made credible or more likely as a result of the CONDITION. Unlike the CONDITION, the DEPARTURE is a statement about what might occur at a future time. It is the uncertainty in the occurrence or non-occurrence of the DEPARTURE that is the initially identified source of risk.

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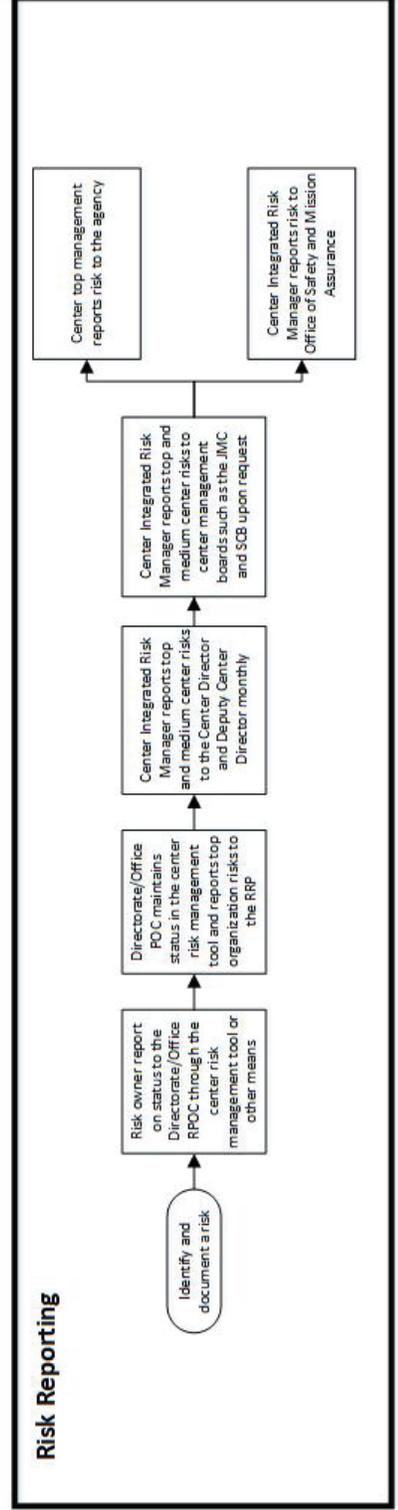
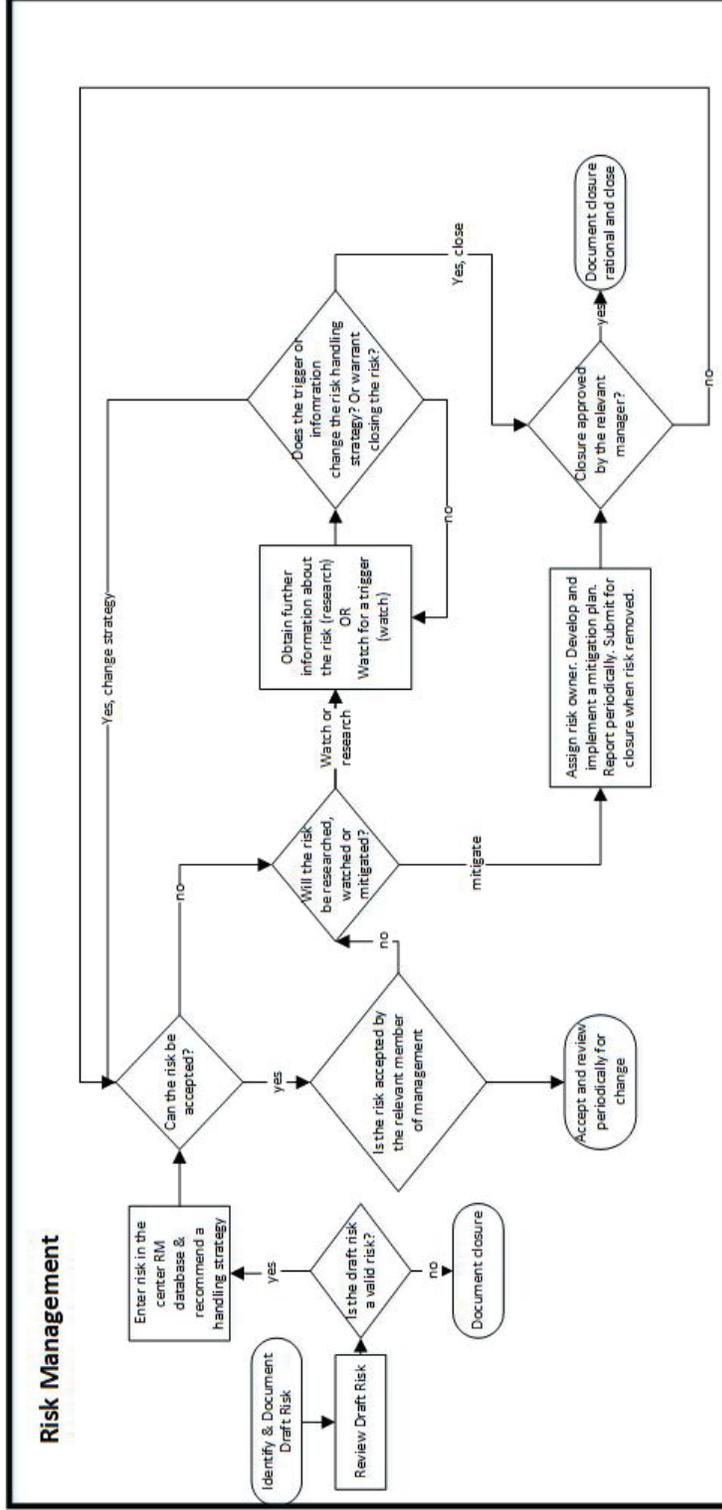
Word	Definition
Draft Risk	A potential risk that has been identified and is pending approval by the RPOC, supervisor, manager or project manager to be a formal risk. A risk may stay in the draft state indefinitely but if action is being taken or it is being watched for a trigger it should be approved as a risk.
Handling Strategy	How a risk will be approached. Options in the SSC process are watch, mitigate, research or accept.
Impact	See consequence.
Joint Management Council (JMC)	Center-level risk decision making authority that includes leadership from all directorates and offices. Among other duties, the JMC serves as the central element for risk informed decision making at the Center-level.
Likelihood	The probability that a risk will occur.
Medium Risk Report	Risks that are deemed less significant than a top risk but are not tolerable and are being mitigated. These are generally rated as yellow but are sometimes red using the SSC scorecard
Mitigate	Taking action to reduce the severity of a risk, either by reducing the probability of it occurring, or by reducing the level of impact if it does occur, or both.
Mitigation Plan	A plan put in place to mitigate a risk impact. The plan can consist of a number of steps. The plan can act to mitigate the impact of more than one risk. For example, a mitigating plan which involves staff training or safety initiatives could act to mitigate a number of risks within the organization.
Open Risk	A risk that is being mitigated, watched, or researched. Generally closed or accepted risks are not included in open/active risk lists.
Probability	The chance of something occurring.
Problem	A risk that has already occurred. Also referred to as an issue.
Research	Obtain additional information about a risk for further action, evaluation, or analysis.
Risk	The scenario(s) leading to degraded performance with respect to one or more performance measures in combination with the probability and the consequences should the degraded performance occur.
Risk Informed Decision Making (RIDM)	A deliberative process in consultation with the organizational unit at the next lower level to inform management decision-making. RIDM requires the risk analysis of alternatives and the selection of a decision alternative that is informed by these results.

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Word	Definition
Risk Management (RM)	An organized, systematic decision-making process that efficiently identifies, analyzes, plans, tracks, controls, communicates, and documents risks.
Risk Point of Contact (RPOC)	Individual(s) responsible for providing RM support to the Directorate/Office and representing the directorate/office on the RRP.
Risk Management Plan (RMP)	Document that formally defines and establishes an organization's approach to conducting RM including the organization's RM strategy; organizational structure, relationships, and responsibilities for managing risk; guidelines and policies regarding processes, metrics and tools for executing and communicating an Integrated RM methodology; and the RM resource investments required.
Risk Owner	The individual to whom the risk is assigned for purposes of responsibility and accountability.
Risk Review Panel (RRP)	The risk vetting committee of SSC composed of a representative from all directorates and offices. They are responsible for reviewing all risks submitted to senior management and developing a proposed Center-level Top and Medium risk report for submission to senior management.
Risk Score	A numeric representation of the overall risk severity, taking into account both the risk consequence and the probability of that impact occurring.
Risk Statement	A descriptive statement that defines the condition of the risk and its consequence. SSC uses the condition, departure, asset and consequence to formulate risk statements.
Top Risk	Those undesirable events are above a certain threshold defined by a Center, directorate or office. Top risks can be identified in a directorate or office or as top Center risk list.
Watch	Track a risk until a defined trigger requires additional action.
Watch List	Risks that have a handling strategy as watch. The impacts (consequences) of these risks are normally are tolerable given the current environment/circumstances. The impacts may be intolerable if the current environment/circumstances change, so these risks are monitored for a trigger that might warrant additional action. These risks are generally rated as green using the SSC scorecard.

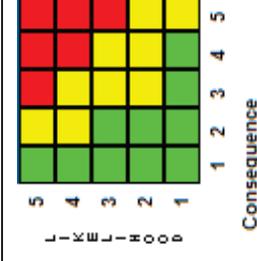
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APPENDIX C SSC RISK MANAGEMENT PROCESS FLOW



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APPENDIX D SSC SCORECARD



LIKELIHOOD RATING

1 Very Low	Qualitative: Very unlikely to occur, management not required in most cases. Strong controls in place. Quantitative: $\leq 10\%$ (for risks with primary impact on Cost, Schedule, or Performance) or $\leq E-5$ (for risks with primary impact on Safety)
2 Low	Qualitative: Not likely to occur, management not required in all cases. Controls have minor limitations/uncertainties. Quantitative: $\leq 11-35\%$ (for risks with primary impact on Cost, Schedule, or Performance) or $\leq E-4$ (for risks with primary impact on Safety)
3 Moderate	Qualitative: May occur, management required in some cases. Controls exist with some uncertainties. Quantitative: $\leq 36-65\%$ (for risks with primary impact on Cost, Schedule, or Performance) or $\leq E-3$ (for risks with primary impact on Safety)
4 High	Qualitative: Highly likely to occur, most cases require management attention. Controls have significant uncertainties. Quantitative: $\leq 66-90\%$ (for risks with primary impact on Cost, Schedule, or Performance) or $\leq E-2$ (for risks with primary impact on Safety)

LIKELIHOOD

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5	Very High	<p>Qualitative: Nearly certain to occur, requires immediate management attention. Controls have little or no effect.</p> <p>Quantitative: >90% (for risks with primary impact on Cost, Schedule, or Performance) or <=E-1 (for risks with primary impact on Safety)</p>
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Table D.1 SSC Scorecard – Likelihood Definitions
Table D.2 SSC Scorecard – Consequence Definitions

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		Very Low—1	Low—2	Moderate—3	High—4	Very High—5
Consequence Rating—Level						
Cost		\$0 - \$500,000 no or little impact to schedule impact can be compensated with available margin	\$500,001 - \$1,000,000 small impact with slight schedule changes impact can be accommodated with margin and reserve	\$1,000,001 - \$5,000,000 moderate impact to schedule impact can be accommodated with margin and reserve	\$5,000,001 - \$10,000,000 major schedule impacts recovery possible with change in customer or contract agreements	Over \$10,000,000 no recovery in critical path or no ability to meet agency/mission capability need date or contract deliverable date
Schedule		there is some margin remaining no change to milestone dates 0 months to < 1 month	there is some margin and/or reserve remaining no or small changes to milestones 1 month to < 2 months	consumes all reserve and margin some impact to milestones 2 months to < 3 months	consumes all margin and reserve major impact to milestones 3 months to < 6 months	consumes all margin and reserve unable to achieve major milestones > 6 months
Performance / Technical		Nuisance to operations or generation of an internal non-compliance. No impact on Project/Program Mission objective	Mild corrective actions or slight modifications are available to achieve Program Mission goal, to maintain Agency capability, or remedy non-compliance to current or future Missions Minor impact on Project/Program Mission objective	Corrective actions or modifications may be technically feasible. Program Mission goal, Agency capability, or non-compliance remedy cannot be achieved through available resources or time constraints to current or future Missions Moderate impact on Project/Program Mission objective	Corrective actions or modifications may be technically feasible. Program Mission goal, Agency capability, or non-compliance remedy cannot be achieved through available resources or time constraints to current or future Missions Major impact on Project/Program Mission objective	Corrective actions or modifications may not be technically feasible Project/Program Mission goals are not achievable
Safety		No loss of Center or Agency capability No corrective action or modification is needed to current or future Missions Magnitude of harm or discomfort to employees, contractors, or public is not greater than ordinarily encountered in daily life or injury only requiring first aid	Minor loss of Center or Agency capability, or Administrative regulatory non-compliance. Minor impact due to reduced performance or data, with no workaround required; and acceptable loss of capability or baseline infrastructure capability from an operations standpoint. Technical requirements can be met with minor change in current scope, cost, and schedule Minor medical treatment (does not adversely affect personal safety or health)	Moderate loss of Center or Agency capability, or Moderate regulatory non-compliance. Moderate impact due to reduced performance or data, using available workaround; and can meet requirements with some degradation in performance or infrastructure capability (e.g., loss of efficiency skill, or redundancy). Technical requirements can be met with moderate change in scope, cost, and schedule Medical treatment for a injury or incapacitation	Major loss of Center or Agency capability, or Major regulatory non-compliance. Major impact due to degraded performance or data, with workarounds to be established; or significant degradation in performance or infrastructure capability (e.g., loss of efficiency, skills, or redundancy). Technical requirements can be met with significant change in scope, cost, and schedule Severe injury or incapacitation	Complete loss of critical Center or Agency capability for current or future Missions Unacceptable technical impacts; technical goals cannot be met; loss of performance or critical support infrastructure capability (e.g., loss of efficiency, skills, or redundancy). Cannot meet technical requirements Death or permanent disability
Duration		0 to 1 month	1 to 6 months	6 months to 1 year	1 to 5 years	> 5 years
Profile		No concern from outside SSC (Ex. Internal activities)	Little political effects or generates minor local interest	Registers politically locally (Ex. Small projects with congressional funding, university projects) or requires un-planned engagement with NASA Headquarters/Mission Directorates	Political consequences, local media coverage, loss of jobs	Negative political/regional impact, large media coverage, probable loss of jobs, environmentally sensitive, high cost projects with congressional funding (Ex. SLS related)

Impact / Consequence

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APPENDIX E CONTINUOUS RISK MANAGEMENT

The CRM paradigm depicts the different activities composing RM. CRM provides ongoing assurance of progress towards the achievement of performance requirements. The model is represented as a circle to emphasize that RM is a continuous process while the arrows show the logical and temporal flow of information between the activities in RM. Communication is placed in the center because it is both the conduit through which all information flows and often the major obstacle to RM. In essence, the paradigm is a framework for RM. A brief summary of the CRM activities follows.



- a. **Identify.** Before risks can be managed, they must be identified. Identification surfaces risks before they become problems and adversely affect a project. An effective approach for surfacing risks is by the application of a disciplined and systematic process that encourages personnel to raise concerns and issues for subsequent analysis.
- b. **Analyze.** Analysis is the conversion of risk data into risk decision-making information. Analysis provides the basis for the project manager to work on the “right” risks.
- c. **Plan.** Planning turns risk information into decisions and actions (both present and future). Planning involves developing actions to address individual risks, prioritizing risk actions and creating a risk mitigation plan.
- d. **Track.** Tracking consists of monitoring the status of risks and actions taken to ameliorate risks. Appropriate risk metrics are identified and monitored to enable the evaluation of the status of risks themselves and of risk mitigation plans.
- e. **Control.** Risk control corrects for deviations from planned risk actions. Once risk metrics and triggering events (“Triggering Events” are warning or control limits) have been chosen, there is nothing unique about risk control. Rather, risk control melds into project management and

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relies on project management processes to control risk action plans, correct for variations from plans, respond to triggering events, and improve RM processes.

f. **Communicate/Document**. Risk communication and documentation lies at the center of the model to emphasize both their pervasiveness and criticality. Without an effective documentation system and successful communication, no RM approach can be viable. While communication facilitates interaction among the elements of the model, there are higher level communications to consider as well. To be analyzed and managed correctly, risks must be communicated to and between the directorates/offices. This is accomplished via the SSC JMC and supported by the RRP process.

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APPENDIX F SSC ORGANIZATIONAL RISK MANAGEMENT PLAN OUTLINE

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APPENDIX G JMC RISK VETTING PROCESS FLOW

