

NASA RMC VI

Continuous Risk Management Maturity Assessment

An Improvement Initiative by
Safety, Reliability & Quality Assurance
Policy and Assessment Department/QD40

*Presented by
William E. Powell
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WHY DO CRM?



- As directed by NPR 7120.5, paragraph 4.3.2, Programs/Projects shall implement CRM.
- There are three hundred references to risk and its management in the CAIB Report Vol. 1.
 - “The Shuttle Independent Assessment Team (SIAT) was very concerned with what it perceived as **Risk Management** process erosion created by the desire to reduce costs. (CAIB Report, Vol. 1., Page 114).
 - “All flight entails some measure of **risk**, and this has been the case since before the days of the Wright Brothers. Furthermore, the **risk** is not distributed evenly over the course of the flight. It is greater by far at the beginning and end than during the middle.” (CAIB Report, Vol. 1., Page 207).
- Effective CRM increases the likelihood of success for all Programs/Projects





RISK MANAGEMENT MATURITY ASSESSMENT BACKGROUND



- Earlier Assessments revealed opportunities for improvements of MSFC Programs/Projects Risk Management Implementation.
 - Risk Management Assessment by System Management Office/Safety and Mission Assurance Directorate noted reactive and experimental approach to risk management.
 - Study Results (March, 2003):
 - ~Level 2 (using questionnaire data)
 - ~Level 1 (using product evaluations & interviews)
- MSFC Deputy Center Director authorized initial CRM assessments of four Programs/Projects by S&MA:
 - Project Widget (Project W)
 - Project X-Ray (Project X)
 - Project Yankee (Project Y)
 - Project Zebra (Project Z)
- Utilized a Risk Management Maturity Model that was tailored by S&MA for MSFC Risk Management Assessments
- Assessment results to be briefed at Center PMC meetings



RISK MANAGEMENT MATURITY ASSESSMENT OBJECTIVE



The CRM Assessment objective is to increase MSFC Program/Project performance gains by striving to achieve a Risk Management Maturity Model (RMMM) Level 3 or higher. The results of this assessment process will assist MSFC Programs/Projects by:

- Reducing Cost Overruns
- Reducing Schedule Slips
- Increasing the Likelihood of Mission Success
- Reducing Impact of Problems Through Early Risk Identification
- Supporting NASA CRM Objectives
- Motivating MSFC Program/Project Managers to Comply with CRM per NPR 7120.5 and NPR 8000.4 as an Integral Part of Everyday Operations.



RISK MANAGEMENT MATURITY MODEL (RMMM)



➤ This Risk Management Maturity Model (RMMM) Tool:

- Used for quick and easy point of reference
- Simplified and designed to target weaknesses in a Program/Project's CRM process
- Identifies realistic targets for improvements
- Non-constraining or overly invasive when applied
- Provides guidance for Action Plan generation in developing and enhancing CRM maturity level



RISK MANAGEMENT MATURITY MODEL RELATIONSHIPS



Comparison of Risk Maturity Model Levels

Level	Capability Maturity Model (CMM)	Level	Risk Management Maturity Model (RMMM)
0	<i>Incomplete</i>	1	Ad Hoc
1	<i>Performed</i>	2	Initial
2	<i>Managed</i>	3	Repeatable
3	<i>Defined</i>		
4	<i>Managed Quantitatively</i>	4	Managed
5	<i>Optimizing</i>		

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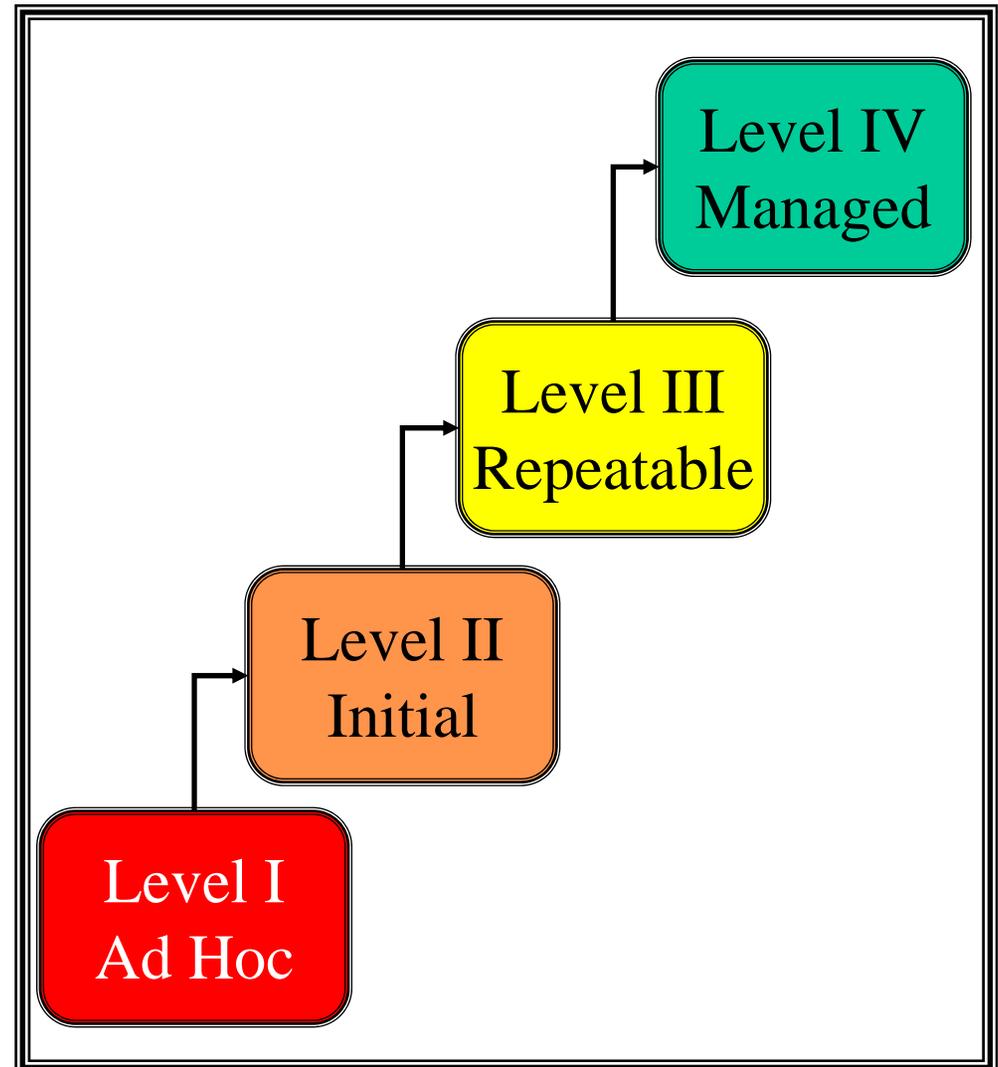


RISK MANAGEMENT MATURITY MODEL



RMMM Four Levels of Maturity

- **Ad Hoc:** The program/project is unaware of the need for risk management and has no structured approach to dealing with uncertainty, resulting in a series of crisis for each program/project.
- **Initial:** The program/project is experimenting with the application of risk management, usually through a small number of nominated individuals within specific programs/projects to perform all CRM activities.
- **Repeatable:** The program/project has implemented risk management into their routine business processes and implements risk management in most, if not all, program/project activities.
- **Managed:** The program/project has established a risk-aware culture, not risk-adverse, that requires a proactive approach to the management of risks in all aspects of the program/project.

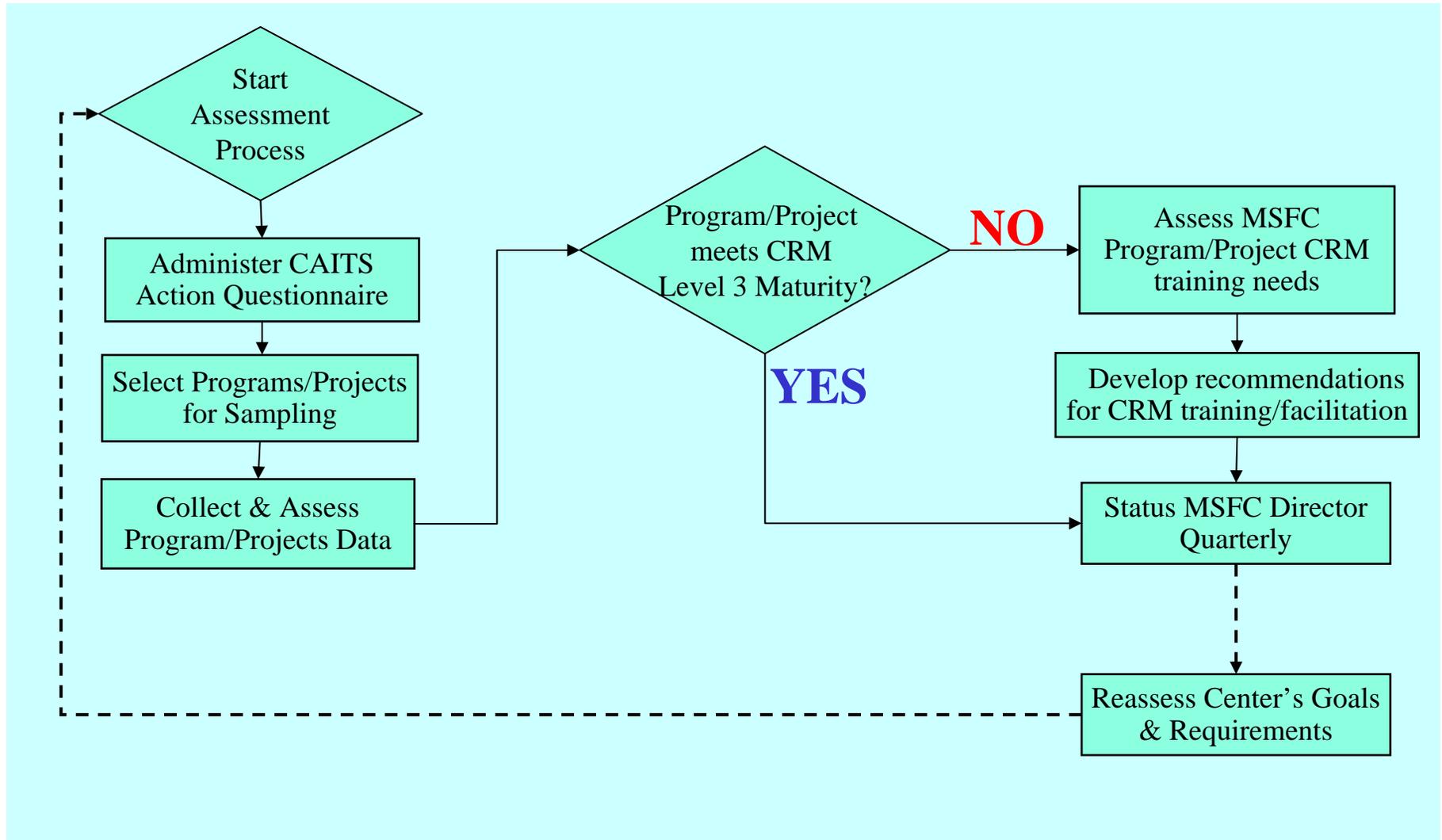




CRM TEAM ASSESSMENT PROCESS



RMMM PROCESS FLOW



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CRM ASSESSMENT DATA SOURCES



- Provided In- brief to Project Managers to introduce Assessment's Objectives and Process
- Distributed S&MA CRM Website Questionnaire and Project Risk Assessment Interview Questionnaires for project team completion
- Reviewed Project Data:
 - Project and Risk Management Plans
 - Project Risk Reports
 - Project Risk Mitigation Plans
 - Project Risk Database Demonstrations
 - Project Cost Performance Data and Schedules
 - Project Risk Management Metrics
- Conducted Personal Interviews with Project Team Members
- Observed Project Meetings
- Applied Noted Observations/Finding to RMMM to determine Maturity Level
- Provided Individual Out brief to Project Managers, noting observations/finding, maturity Level and recommendations for improvement



RISK MANAGEMENT MATURITY MODEL (RMMM) CATEGORY DESCRIPTIONS



CATEGORY	RMMM CATEGORY DESCRIPTIONS
Definition	Awareness of CRM and actively implemented throughout the project life-cycle.
Culture	Management encourages & supports CRM processes throughout the project's life-cycle.
Process	A formalized CRM process is documented in the project risk management plan and supported by project management.
Experience	An established cadre of CRM practitioners provide active support of CRM within the project.
Training	Project personnel that have had formal CRM training on risk principles and are proficient in using the project risk database.
Documents	Project implements CRM as identified in NPR 7120.5, NPR 8000.4, MWI 7120.6 and the project risk management plan.
Application	The project has implemented CRM processes (risk lists, risk matrix, risk waterfall, etc...) throughout the project's life-cycle.

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PROJECT W RISK MANAGEMENT MATURITY MODEL (RMMM) SCORES BY CATEGORY



CATEGORY	RMMM SCORE	RMMM SUMMARY OF RESULTS (See Backup Charts for Details)
Definition	Level 3 Repeatable	The Project W Team has exceeded the criteria established for Levels 1 & 2 and has met the criteria for Level 3 – Repeatable to include: (1) Program/Project has a formalized generic risk process; (2) Risk Management of uncertainty built into all organizational processes; and (3) Risk management implemented on most or all projects/components.
Culture	Level 2 Initial	The Project W Team has exceeded the criteria established for Level 1 and has met the criteria for Level 2 – Initial to include: (1) Management encourages, but does not require, use of Risk Management and risk statusing; (2) Risk process has an established communication path between the risk management team and the program management team, organizational management, customers, and stakeholders and (3) Risk management used only on selected projects/components or on Ad Hoc basis.
Process	Level 3 Repeatable	The Project W Team has exceeded the criteria established for Levels 1 & 2 and has met the criteria for Level 3 – Repeatable to include: (1) Mechanism exists for monitoring corrective actions taken and tracking open risk items to closure. (i.e. Risk Management Database); (2) Program/Project Manager meets weekly/monthly with key suppliers for status reviews to discuss Risk Metrics and program impacts; and (3) Categorize risks into a handling strategy (watched, mitigated, or accepted).
Experience	Level 2 Initial	The Project W Team has exceeded the criteria established for Level 1 and has met the criteria for Level 2 – Initial to include: (1) Limited to individuals who may have had little or no formal training within the past year and (2) Project personnel skill level not adequate for communication phase of the risk management paradigm.
Training	Level 2 Initial	The Project W Team has exceeded the criterion established for Level 1 and has met the criterion for Level 2 – Initial to include: 30% project personnel have some formal CRM training and risk database training.
Documents	Level 3 Repeatable	The Project W Team has exceeded the criteria established for Levels 1 & 2 and has met the criteria for Level 3 – Repeatable to include: (1) Approved Risk Management Plan; (2) Risk list exist and is widely circulated and (3) Utilizes an accepted database to document and control risks.
Application	Level 2 Initial	The Project W Team has exceeded the criteria established for Level 1 and has met the criteria for Level 2 – Initial to include: (1) Minimal qualitative analysis used to support quantitative assessment; (2) The program/project has recurring risk management activities (Program Management Review, Risk Team Meetings, CRM Training, Risk Mitigation Planning, etc.) and (3) Minimal risk mitigation planning and tracking.

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RECOMMENDATIONS FOR PROJECT W IMPROVEMENTS

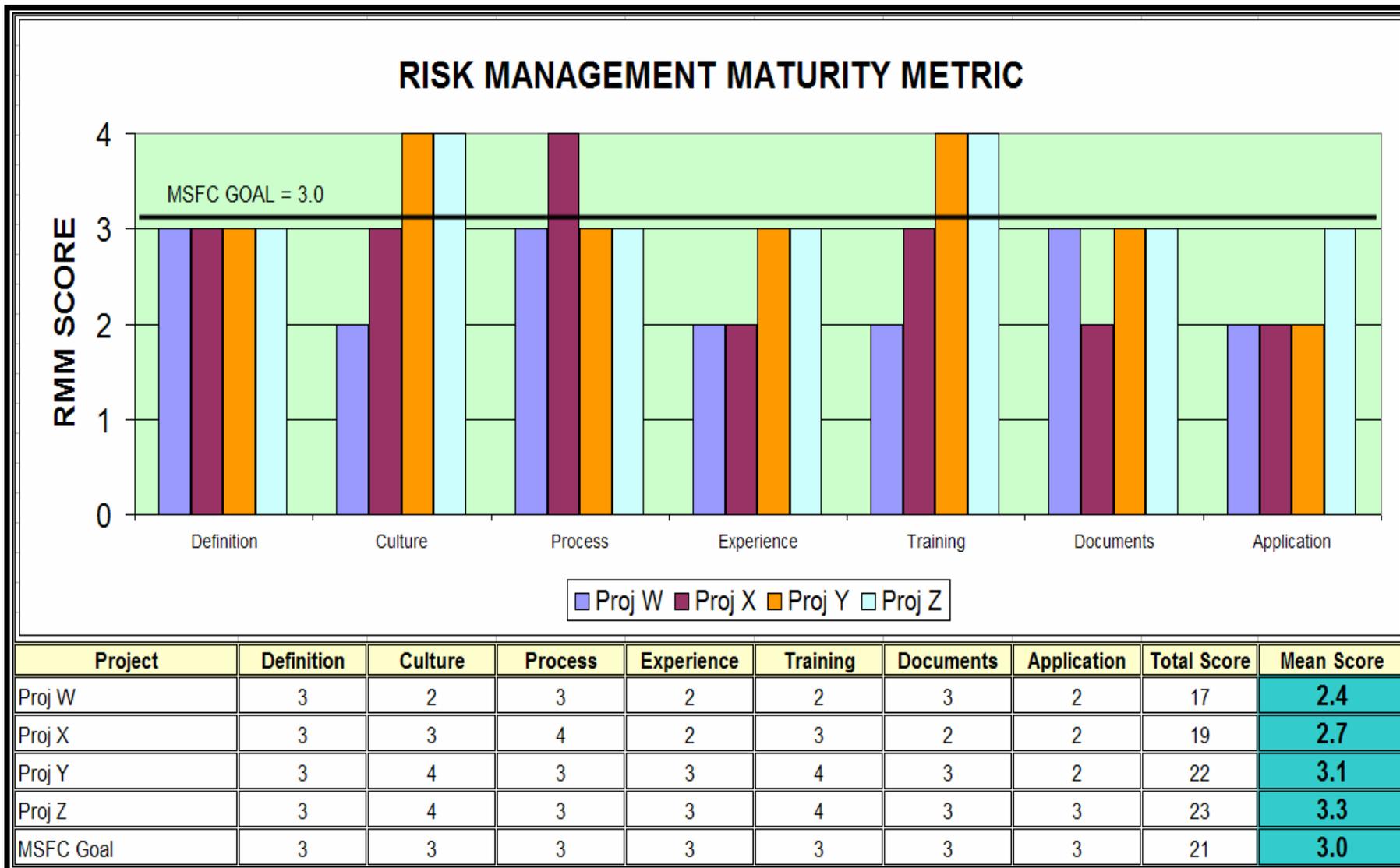


CATEGORY	MSFC GOAL 3	RECOMMENDATIONS TO IMPROVE RMMM SCORE
Definition	Level 3 Repeatable	The Project W Team has successfully achieved a Risk Management Maturity Model Level 3 – Repeatable for “Definition”; however, we encourage the Project W Project Manager to continue striving to maintain this level by ensuring that each project team member is familiar with the requirements of NPR 7120.5, NPR 8000.4, MWI 7120.6 and stays proficient in CRM through remedial training.
Culture	Level 2 Initial	♦ In order for the Project W Team to achieve the MSFC Goal of 3 - Repeatable for “Culture”, the Project W Project Team must demonstrate: (1) That a dedicated Risk Manager supports the concepts of CRM and enforces “Risk Reporting” on weekly/monthly basis as part of the project’s requirements and (2) That the Project W project has dedicated resources for Continuous Risk Management (CRM).
Process	Level 3 Repeatable	The Project W Team has successfully achieved a Risk Management Maturity Model Level 3 – Repeatable for “Process”; however, we encourage the Project W Project Manager to continue striving to maintain this level by ensuring that each project team member is familiar with the requirements of NPR 7120.5, NPR 8000.4, MWI 7120.6, and follow the processes outlined in the Project W Risk Management Plan. In addition each team member should stay proficient in CRM through remedial training with a CRM Workshop.
Experience	Level 2 Initial	♦ In order for the Project W Team to achieve the MSFC Goal of 3 – Repeatable for “Experience”, each project team member must demonstrate: (1) The development and use of specific CRM training skills, processes, and tools that are current and maintained; (2) That the Project W Risk Management plan has been implemented and utilized; and (3) That each team member fully understands the requirements of NPR 7120.5, NPR 8000.4 and MWI 7120.6 and they have been successfully implemented on the Project W project.
Training	Level 2 Initial	♦ In order for the Project W Team to achieve the MSFC Goal of 3 – Repeatable for “Training”, the project team must demonstrate: (1) That 50% of the Project W project personnel have some formal CRM training and that team members are skilled in the RAD risk database (i.e., RAD Access, Risk Identification, Inputting Risk Mitigation Plans, etc.). This can be achieved by scheduling CRM Training to include the CRM Workshop and by establishing an in-house On-the-Job (OJT) training program for RAD to minimize single point failures.
Documents	Level 3 Repeatable	The Project W Team has successfully achieved a Risk Management Maturity Model Level 3 – Repeatable for “Documents”; however, we encourage the Project W Project Manager to continue striving to maintain this level by ensuring that each project team member has access to NPR 7120, NPR 8000.4, MWI 7120.6 and ensure that the Project W Risk Management Plan contains the latest information to include processes regarding CRM.
Application	Level 2 Initial	♦ In order for the Project W Team to achieve the MSFC Goal of 3 – Repeatable for “Application”, the project team must demonstrate: (1) Risk mitigation planning and waterfall charts for appropriate risks exists within the project; and (2) Evidence that some risks are being successfully brought down to an accepted level (from High to Moderate, etc.). This can be achieved by maintaining the existing risk mitigation plans and tracking them.

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RMMM ASSESSMENT RESULTS



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ASSESSMENT FINDINGS/OBSERVATIONS SUMMARY



- Projects have defined and documented appropriate Risk Management requirements and processes but fail to implement continuously.
- Risk Statements are not in compliance with NPR 8000.4 (i.e. One Condition per One Consequence).
- Project Risk Management Plans are not consistently maintained on some projects (i.e. document out-of-date, risk statement structure, context, etc.).
- Project Risk Management Metrics are not utilized to maximum potential.
- Risk Mitigation Plans are not well established or properly implemented.
- Project Teams are incorporating the minimal amount of CRM Training required to achieve project objectives. Remedial training is not being encouraged (CRM Refresher Training, CRM Workshops, etc.)



CRM ASSESSMENT RECOMMENDATIONS



- Risk Management Assessments should be an integral part of Non-Advocate Reviews (NARs) to assure program/project risk management processes are implemented throughout the program/project life-cycle.
- Program/Project Teams should incorporate CRM Training into program/project objectives. Remedial training is highly encouraged for compliance with Agency's standards and requirements.
- Authorize CRM Assessments of additional MSFC Programs/Projects for FY06 including follow up of projects not achieving goal of Level 3 during the initial assessment.



HERE'S HOW S&MA/QD40 CAN HELP



CRM Training Is Available Through S&MA/QD40

- **Introduction to CRM**: This two-day course familiarizes the student with the fundamentals of CRM and provides interactive learning through the implementation of the CRM process. Also, hands-on project team workshops are conducted that are specifically tailored to the needs of the project. Certified CRM instructors facilitate at these workshops.
- **CRM Refresher Course**: This one-day course refreshes the student's knowledge of CRM fundamentals. It is given to project members who have had CRM training in the past, but have not been active in its implementation.
- **CRM Executive Overview**: This presentation familiarizes the project and senior managers with the fundamentals of CRM. This is strictly a process overview and does not provide the in-depth discussion needed for project implementation.
- **Risk Database Training Offered**: Integrated Risk Management Application (IRMA), ePORT, and Active Risk Manager (ARM)



HERE'S HOW S&MA/QD40 CAN HELP



CRM FACILITATION: MSFC recognizes that training and facilitation are key ingredients of any effective CRM Program. Facilitation of the CRM process includes:

- Structured workshops are offered to assist a project in tailoring its CRM Program, preparing CRM plans, developing risk lists, etc.
- Process improvement evaluations are also offered in establishing project risk review boards to develop and implement the CRM process in the technical community.

RISK MANAGEMENT ASSESSMENT PROCESS: S&MA/QD40 has established a Centerwide CRM Risk Management Maturity Model Assessment process to:

- Determine compliance of MSFC programs and projects with CRM approved standards.
- Identify areas for improvement.
- Aid in the successful implementation of CRM at MSFC.

For additional CRM information on tools and Processes, visit the MSFC CRM Web Site:

https://msfcsma3.msfc.nasa.gov/dbwebs/apps/Virtual_S&MA/qs40/crm/

MSFC CRM POCS: Bill Powell, 544-2124 and Keith Layne, 544-4801



RISK MANAGEMENT MATURITY ASSESSMENT BACKUP



BACKUP CHARTS



RISK MANAGEMENT MATURITY LEVEL CRITERIA



Category	Level 1 – Ad Hoc	Level 2 – Initial	Level 3 – Repeatable	Level 4 - Managed
Definition	<ul style="list-style-type: none"> <input type="checkbox"/> Unaware of the need for risk management procedures/processes. <input type="checkbox"/> Little or no attempt to utilize lessons learned from past projects or prepare for future projects 	<ul style="list-style-type: none"> <input type="checkbox"/> Experimenting with risk management through a small number of individuals, not a team concept. <input type="checkbox"/> Risk list has been established but not implemented/managed. 	<ul style="list-style-type: none"> <input type="checkbox"/> Program/Project has a formalized generic risk process. <input type="checkbox"/> Risk Management of uncertainty built into all organizational processes. <input type="checkbox"/> Risk management implemented on most or all projects/components. 	<ul style="list-style-type: none"> <input type="checkbox"/> Active use of the risk data to improve organizational processes and gain a proactive approach to risk management in all aspects of the organization. <input type="checkbox"/> Trend data used to make sound management decisions.

Category	Level 1 – Ad Hoc	Level 2 – Initial	Level 3 – Repeatable	Level 4 - Managed
Culture	<ul style="list-style-type: none"> <input type="checkbox"/> Limited management involvement, there is a tendency to continue with existing processes even in the face of project failures. <input type="checkbox"/> Doesn't fulfill the need for CRM in the program/project. 	<ul style="list-style-type: none"> <input type="checkbox"/> Management encourages, but does not require, use of Risk Management and risk statusing. <input type="checkbox"/> Risk process has an established communication path between the risk management team and the program management team, organizational management, customers, and stakeholders. <input type="checkbox"/> Risk management used only on selected projects/components or on Ad Hoc basis. 	<ul style="list-style-type: none"> <input type="checkbox"/> Dedicated Risk Manager supports CRM concepts and requires risk reporting on a monthly basis. <input type="checkbox"/> Program/Project has dedicated resources for risk management. 	<ul style="list-style-type: none"> <input type="checkbox"/> Program/Project Manager implements a top-down commitment to risk management, with leadership by example <input type="checkbox"/> A process is implemented to resolve program related risk issues between customers, stakeholders, project office etc through status reviews that are on going.

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RISK MANAGEMENT MATURITY LEVEL CRITERIA



Category	Level 1 – Ad Hoc	Level 2 – Initial	Level 3 – Repeatable	Level 4 - Managed
Process	<ul style="list-style-type: none"> <input type="checkbox"/> No documented process exists. <input type="checkbox"/> Limited knowledge of risk interrelationships and how CRM impacts the Program/Project 	<ul style="list-style-type: none"> <input type="checkbox"/> No generic formal processes, although some specific formal methods may be in use. <input type="checkbox"/> Risk Management Metrics have been established (i.e. 5x5, Risk Waterfall, Performance Measurement (EVM) and Logic Networks) <input type="checkbox"/> Process effectiveness depends on the skills of the project risk team and the availability of external support. <input type="checkbox"/> All risk personnel located within program/project. 	<ul style="list-style-type: none"> <input type="checkbox"/> Mechanism exists for monitoring corrective actions taken and tracking open risk items to closure. (i.e. Risk Management Database) <input type="checkbox"/> Program/Project Manager meets weekly/monthly with key suppliers for status reviews to discuss Risk Metrics and program impacts. <input type="checkbox"/> Categorize risks into a handling strategy (watched, mitigated, or accepted). 	<ul style="list-style-type: none"> <input type="checkbox"/> Routine risk metrics are used with consistent feedback for improvement of the program/project. <input type="checkbox"/> Program/Project risks are integrated into the budget and schedule. <input type="checkbox"/> PM shall establish the criteria for accepting risks, document the rationale, and include the signed formal acceptance within the risk acceptance records. <input type="checkbox"/> Active allocation and management of risk related budgets and schedules at all levels.
Category	Level 1 – Ad Hoc	Level 2 – Initial	Level 3 – Repeatable	Level 4 - Managed
Experience	<ul style="list-style-type: none"> <input type="checkbox"/> Does not understand how to identify risk or that risks are inherent in programs/projects. <input type="checkbox"/> Does not understand how risk impacts cost, schedule, safety and technical performance. 	<ul style="list-style-type: none"> <input type="checkbox"/> Limited to individuals who may have had little or no formal training within the past year? <input type="checkbox"/> Project personnel skill level not adequate for communication phase of the risk management paradigm. 	<ul style="list-style-type: none"> <input type="checkbox"/> Development and use of specific, risk management training skills, processes, and tools. <input type="checkbox"/> Implementation of Program/Project Risk Management Plan <input type="checkbox"/> Implementation of NPR 8000.4 	<ul style="list-style-type: none"> <input type="checkbox"/> All program/project team members are aware of risk and capable of implementing the CRM processes for risk reduction.

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RISK MANAGEMENT MATURITY LEVEL CRITERIA



Category	Level 1 – Ad Hoc	Level 2 – Initial	Level 3 – Repeatable	Level 4 - Managed
Training	<input type="checkbox"/> Less than 10% of project personnel have little or no formal CRM training or exposure to CRM concepts.	<input type="checkbox"/> 30% project personnel have some formal CRM training and risk data base training.	<input type="checkbox"/> 50% of project personnel have some formal CRM training and risk data base training.	<input type="checkbox"/> More than 75% of project personnel have some formal CRM training and risk data base training.

Category	Level 1 – Ad Hoc	Level 2 – Initial	Level 3 – Repeatable	Level 4 - Managed
Documents	<input type="checkbox"/> No Risk Management Plan, risk list, control/process to handle identified risk, and no support program documents available for reference (i.e., NPR 7120.5, NPR 8000.4, and MWI 7120.6)	<input type="checkbox"/> Written Risk Management Plan Risk list exist but not widely circulated. <input type="checkbox"/> Minimal knowledge of CRM documentation (NPR 7120.5, NPR 8000.4 and MWI 7120.6). <input type="checkbox"/> Utilizes a computerized tracking system to document and control risks.	<input type="checkbox"/> Approved Risk Management Plan. <input type="checkbox"/> Risk list exist and is widely circulated. <input type="checkbox"/> Utilizes an accepted database to document and control risks.	<input type="checkbox"/> Approved Risk Management Plan that is followed and updated as required. (Living Document) <input type="checkbox"/> Risk list maintained in a accepted CRM database with Top N risks listed at each organizational level/tier is available to all team members

Category	Level 1 – Ad Hoc	Level 2 – Initial	Level 3 – Repeatable	Level 4 - Managed
Application	<input type="checkbox"/> Does not relate risks to cost, schedule and technical progress. <input type="checkbox"/> Does not have a formal Work Breakdown Structure (WBS) in place. <input type="checkbox"/> No structured application, dedicated resources, risk management tools in use, or risk analysis performed.	<input type="checkbox"/> Minimal qualitative analysis used to support quantitative assessment. <input type="checkbox"/> The program/project has recurring risk management activities (Program Management Review, Risk Team Meetings, CRM Training, Risk Mitigation Planning, etc.) <input type="checkbox"/> Minimal risk mitigation planning and tracking.	<input type="checkbox"/> Risk mitigation planning and mitigation steps for appropriate risks exist throughout the program/project. <input type="checkbox"/> Evidence some risks are being successfully brought down to accepted level (from High to Moderate, etc.).	<input type="checkbox"/> Both qualitative and quantitative risk analysis methodologies used with emphasis on having valid and reliable historical data sources. <input type="checkbox"/> Risks metrics (risk trending, waterfall charts, etc.) are utilized & maintained on a regular basis to communicate that risks are being brought down. <input type="checkbox"/> All risks are being successfully brought down to accepted level (from High to Low, etc.).



CRM ASSESSMENT TERMS



- **Finding – An item which is in violation of the NASA CRM requirements stated in NASA NPRs 7120.5 & 8000.4 or other risk related NASA documents.**
- **Observation – Those items not in violation of NPRs 7120.5 & 8000.4 or other NASA risk management related documents, but would benefit MSFC programs/projects by enhancing their CRM practices.**
- **Rationale – Statement used to justify Findings or Observations.**
- **Recommendation – Provided to assist the MSFC Programs/Projects to be in compliance with NASA risk management requirements and to improve CRM practices.**



RISK MANAGEMENT MATURITY LEVEL ASSESSMENT



Category	Observations/Findings	Rationale	Recommendation	Risk Management Maturity Score
Definition	<ul style="list-style-type: none"> ❑ <u>Observation</u>: Risk Management Plan, Paragraph 4.1.1: Risk statements do not reflect the NASA process of one condition plus one consequence gives one valid risk statement. 	<ul style="list-style-type: none"> ❑ The Project W Team risk management plan does not reflect current NASA HQ S&MA approved risk statement format. CRM best practices indicate that risks are better controlled/mitigated when stated with one condition per consequence/impact. 	<ul style="list-style-type: none"> ❑ The Project W Team should consider updating all risk statements to contain one condition per one consequence. The PM concurs that some statements need to be revised to meet this standard. 	<p style="text-align: center;"><u>Level 3 – Repeatable</u></p> <ul style="list-style-type: none"> ➤ Program/Project has a formalized generic risk process. ➤ Risk Management of uncertainty built into all organizational processes. ➤ Risk management implemented on most or all projects/components.

Category	Observations/Findings	Rationale	Recommendation	Risk Management Maturity Score
Culture	<ul style="list-style-type: none"> ❑ <u>Kudos</u>: Project W PM demonstrated that CRM is being implemented throughout the project. ❑ <u>Finding</u>: Although the Project W Project Team has implemented CRM within the project, the RAD database and risk mitigation plans are not maintained on an up-to-date basis; therefore the Project W Project Team is not achieving their full potential in meeting CRM requirements. 	<ul style="list-style-type: none"> ❑ To ensure that CRM is correctly implemented throughout Project W. ❑ CRM activities to include maintaining a risk database and developing risk mitigation plans should be part of the day-to-day activities of a program/project. 	<ul style="list-style-type: none"> ❑ Continue to implement CRM throughout Project W. ❑ Instill the discipline within Project W that ensures that all CRM activities are being achieved and that they meet project requirements. 	<p style="text-align: center;"><u>Level 2 – Initial</u></p> <ul style="list-style-type: none"> ➤ Management encourages, but does not require, use of Risk Management. ➤ Risk process has an established communication path between the risk management team and the program management team, organizational management, customers, and stakeholders. ➤ Risk management used only on selected projects/components or on Ad Hoc basis.

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RISK MANAGEMENT MATURITY LEVEL ASSESSMENT



Category	Observations/Findings	Rationale	Recommendation	Risk Management Maturity Score
<p>Process</p>	<p>❑ <u>Finding</u>: The Project W Risk Management Plan, Paragraph 5.2: There is an indication that the Project W Primary risks are not elevated up to the MSFC PMC.</p> <p>❑ <u>Finding</u>: The Project W Risk Management Plan, Paragraph 6.3: Implement Timeframe into the Risk matrix/scoring/ranking process.</p> <p>❑ <u>Observation</u>: Project W Schedules: OGA System indicates -133 Days (Float), Hydrogen ORU indicates -125 Days (Float) and OGS Rack 3 Integration indicates 555 Days (Float)</p>	<p>❑ NPR 8000.4 requires that all primary risks (red risks) be presented to the GPMC or PMC as deemed appropriate. (S&MA CRM Requirements 30901 & 30905)</p> <p>❑ NPR 8000.4, para. 2.3.1, states that timeframe is part of the risk analysis process. A good risk timeframe process will help in the risk ranking process and also determine schedule impact of risks.</p> <p>❑ Risk Metrics do not appear to address the negative float for the OGA System & Hydrogen ORU. The OGS Rack 3 Integration appears to reflect a high float value of 555 days?</p>	<p>❑ Project W Risk Management Plan should develop a risk escalation process to present Project W primary (red) risks to the MSFC PMC. Project W PM states that he does present Top “N” risks to the Director of Space Systems Programs and Projects.</p> <p>❑ Project W shall develop, document and implement the risk timeframe process into the risk mitigation process as it impacts Project W schedule. As identified in NPR 7120.5, risk analysis consists of estimating the likelihood and the consequences of the risk and the timeframe in which action must be taken on an identified risk to avoid adverse consequences. Project W PM will review the requirement and establish a process to incorporate Timeframe as a risk scoring criteria.</p> <p>❑ Project W should review the following schedule impacts: OGA System, Hydrogen ORU and the OGS Rack 3 Integration. Assess the schedule floats to verify if they are accurate in their impact to Project W. Project W PM stated that findings were based on outdated schedule. Additional schedule review is necessary.</p>	<p style="text-align: center;"><u>Level 3 – Repeatable</u></p> <p>➤ Mechanism exists for monitoring corrective actions taken and tracking open risk items to closure. (i.e. Risk Management Database)</p> <p>➤ Program/Project Manager meets weekly/monthly with key suppliers for status reviews to discuss Risk Metrics and program impacts.</p> <p>➤ Categorize risks into a handling strategy (watched, mitigated, or accepted)</p>



RISK MANAGEMENT MATURITY LEVEL ASSESSMENT



Category	Observations/Findings	Rationale	Recommendation	Risk Management Maturity Score
Process (Con't)	<p><input type="checkbox"/> <u>Observation</u>: The Project W Widget Processor Assembly Detailed Report risk context is not documented in current risk reports.</p> <p><input type="checkbox"/> <u>Observation</u>: The Project W Risk Management Plan, Paragraph 4.0: The CRM paradigm is not displayed before the CRM process description.</p> <p><input type="checkbox"/> <u>Observation</u>: The Project W Risk Matrix Report: Risk Matrix Report does not have legend to define state codes.</p>	<p><input type="checkbox"/> A good risk context provides additional information to support the risk statement and its impact to the project.</p> <p><input type="checkbox"/> The CRM paradigm provides a good visual aid of the CRM process.</p> <p><input type="checkbox"/> Legends on the Risk Matrix Reports make it more clear what type of coding is being used.</p>	<p><input type="checkbox"/> Develop, document and implement a risk context process as part of the risk identification process. Additional information on the risk statement will aid in the developing a good mitigation process and also provide archiving (historical) information as it impacts Project W. Project W PM stated that this finding was based on outdated risk mitigation plans. Additional risk mitigation review is necessary.</p> <p><input type="checkbox"/> Add CRM paradigm before the CRM process description to strengthen the message of the CRM process. Project W PM acknowledges as helpful training aid.</p> <p><input type="checkbox"/> Develop clear and concise legends that are easily understood by all Project W members and NASA management. Project W PM acknowledges addition of a report legend could be a helpful report aid.</p>	<p><u>Level 3 – Repeatable</u></p> <p>➤ Mechanism exists for monitoring corrective actions taken and tracking open risk items to closure. (i.e. Risk Management Database)</p> <p>➤ Program/Project Manager meets weekly/monthly with key suppliers for status reviews to discuss Risk Metrics and program impacts.</p> <p>➤ Categorize risks into a handling strategy (watched, mitigated, or accepted).</p>



RISK MANAGEMENT MATURITY LEVEL ASSESSMENT



Category	Observations/Findings	Rationale	Recommendation	Risk Management Maturity Score
Process (Con't)	<input type="checkbox"/> <u>Observation:</u> The Project W Risk Management Plan, Paragraph 7.0: Risk Reporting process does not clearly indicate the risk escalation.	<input type="checkbox"/> The Risk Management Plan and/or other internal documents do not indicate how the Risk Reports are utilized, what risk data captured by what reports etc. Risk Management is most effective when communicated on a regular basis.	<input type="checkbox"/> The Project W Risk Management Plan or internal documents should clearly indicate how/what Risk Reports are utilized by the Project Manager, Project Team etc. Implement a process that summarizes and report risk on an established routine basis. Project W PM stated that they perform monthly reviews and they also implement a risk roll-up/escalation process.	<p><u>Level 3 – Repeatable</u></p> <ul style="list-style-type: none"> ➤ Mechanism exists for monitoring corrective actions taken and tracking open risk items to closure. (i.e. Risk Management Database) ➤ Program/Project Manager meets weekly/monthly with key suppliers for status reviews to discuss Risk Metrics and program impacts. ➤ Categorize risks into a handling strategy (watched, mitigated, or accepted)

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Experience	<p><input type="checkbox"/> <u>Kudo</u>: Decisions regarding risk mitigation actions include considerations of the cost, schedule, technical, and safety impacts of mitigating the risks and of the potential impacts if the unmitigated risks were to be realized.</p> <p><input type="checkbox"/> <u>Kudo</u>: Risks are reviewed with the ISS Program customer during the course of the yearly POP budget planning cycle. As a result, agreements are made with regard to how much contingency funding will be budgeted for Project W project risks. Typically, the contingency funding is held by the Program office as a reserve and dispensed to the project over the course of the year as needed.</p>	<p><input type="checkbox"/> None Required.</p> <p><input type="checkbox"/> None Required.</p>	<p><input type="checkbox"/> None Required.</p> <p><input type="checkbox"/> None Required</p>	<p><u>Level 2 – Initial</u></p> <p>➤ Limited to individuals who may have had little or no formal training.</p> <p>➤ Project personnel skill level not adequate for communication phase of the risk management paradigm.</p>

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Training	<p><input type="checkbox"/> <u>Observation</u>: Project W Project Team is uncertain how many project team members have had CRM Training or Risk Database Training.</p>	<p><input type="checkbox"/> CRM Training and Risk Database Training should be required of project team members.</p>	<p><input type="checkbox"/> Review Project W Project Team member’s training records to determine training requirements.</p>	<p><u>Level 2 – Initial</u></p> <p>➤ 30% or less of project personnel have some formal CRM training and risk data base training.</p>

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Documents	<p><input type="checkbox"/> <u>Observation</u>: Risk Management Plan: NASA documentation references are outdated.</p> <p><input type="checkbox"/> <u>Finding</u>: Project W Risk List: No Risk Owner identified with each risk.</p> <p><input type="checkbox"/> <u>Finding</u>: Risk Management Plan: NPR 8000.4 is not reflected in the document.</p> <p><input type="checkbox"/> <u>Observation</u>: Risk Management Plan: Safety performance is not addressed in the Risk Management Plan.</p> <p><input type="checkbox"/> <u>Kudo</u>: Risk Management Plan: Risk Management Process & Data Flow is noteworthy.</p>	<p><input type="checkbox"/> Does not reflect the current NASA documentation.</p> <p><input type="checkbox"/> Each risk should have a risk owner identified in order to discuss risk issues with (mitigation, status, etc.)</p> <p><input type="checkbox"/> NPR 8000.4 is the master risk management process document for NASA.</p> <p><input type="checkbox"/> Safety performance must be addressed along with cost, schedule & technical constraints in the risk management plan.</p> <p><input type="checkbox"/> Good process definition & flow.</p>	<p><input type="checkbox"/> Implement the latest version of the NASA documents for reference and process implementation. Project W PM acknowledges that Project W RM plan requires a review and possible update.</p> <p><input type="checkbox"/> Identify a Risk Owner for each risk identified on the Risk List as per NPR 8000.4, Para. 2.4.1 & Appendix C. The Project W PM assures us that a Risk Owner is assigned to each risk.</p> <p><input type="checkbox"/> Add NPR 8000.4 to Project W Risk Management Plan reference section as per NPR 7120.5C, para. 3.3.</p> <p><input type="checkbox"/> Safety performance should be documented in the risk management plan either separately or addressed under technical performance as per NPR 7120.5, para. 3.2.5.2.d.6.ii.</p> <p><input type="checkbox"/> None Required.</p>	<p><u>Level 3 – Repeatable</u></p> <p>➤ Approved Risk Management Plan.</p> <p>➤ Risk list exist and is widely circulated.</p> <p>➤ Utilizes an accepted database to document and control risks.</p>

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Application	<ul style="list-style-type: none"> <input type="checkbox"/> <u>Observation</u>: Project W Risk List: Risk lists ECDs are not up to date. <input type="checkbox"/> <u>Observation</u>: Project W Risk List: No date when risk was identified. <input type="checkbox"/> <u>Observation</u>: Project W Risk Matrix report trending section: open vs. closed numbers are confusing. <input type="checkbox"/> <u>Observation</u>: Risk Trend report: Total Exposure/10 is not defined? <input type="checkbox"/> <u>Observation</u>: Risk Reports do not address Accepted Risks. 	<ul style="list-style-type: none"> <input type="checkbox"/> Risk list should be updated to reflect current status of risk. <input type="checkbox"/> Need to determine age of risk <input type="checkbox"/> Need to differentiate between open vs. closed risk for clearer data presentation. <input type="checkbox"/> Total Exposure/10 not defined. <input type="checkbox"/> Risk List does not reflect any risks that have been accepted. 	<ul style="list-style-type: none"> <input type="checkbox"/> Update risk list to reflect correct mitigation status i.e. ECD, rank or Actual Completion Date (ACD), Open/Closed. <input type="checkbox"/> Modify risk list to include risk identification date. <input type="checkbox"/> Differentiate between open vs. closed risk for clearer data presentation will illustrate how well the CRM process is being implemented throughout program. <input type="checkbox"/> Define Total Exposure/10 algorithm. <input type="checkbox"/> Risks that have been accepted shall be signed off by the Project Manager in accordance with NPR 8000.4. Primary Risks that have been accepted shall be approved through the PMC in accordance with NPR 7120.5. 	<p style="text-align: center;"><u>Level 2 – Initial</u></p> <ul style="list-style-type: none"> ➤ Minimal qualitative analysis used to support quantitative assessment. ➤ The program/project has recurring risk management activities (Program Management Review, Risk Team Meetings, CRM Training, Risk Mitigation Planning, etc.) ➤ Minimal risk mitigation planning and tracking.

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Application (Con't)	<p><input type="checkbox"/> <u>Observation:</u> Risk Mitigation Report appears to be out of sequence and Completed Status column not updated.</p> <p><input type="checkbox"/> <u>Observation:</u> Reference Risk Mitigation Report: Mitigation Plan Cost column unchecked for all mitigation tasks?</p> <p><input type="checkbox"/> <u>Observation:</u> In the sample risk report provided (W032), Mitigation Plan Historical Events/Status Report: Appears to be incomplete or truncated report.</p> <p><input type="checkbox"/> <u>Observation:</u> Risk Management Plan: Require a top level integrated Project W Master schedule for analysis.</p>	<p><input type="checkbox"/> Sample Risk Mitigation report tasks lists appear out of sequence and did not show a logical mitigation flow.</p> <p><input type="checkbox"/> Cost column appears to be required but is not being used and can not determine what/why the data is needed.</p> <p><input type="checkbox"/> In the sample risk report provided (W032), there is only one entry reported in the historical event section of the report.</p> <p><input type="checkbox"/> To provide a better understanding for reviewing schedule risks and impacts.</p>	<p><input type="checkbox"/> Risk mitigation tasks should be listed in chronological order or provide rational for tasks flow.</p> <p><input type="checkbox"/> Provide rational & documentation for Cost column in detailed risk report.</p> <p><input type="checkbox"/> Provide a more complete and concise record of events in the Mitigation Plan Historical Events/Status Report.</p> <p><input type="checkbox"/> Deliver a top level full schedule from Project W project management team. This would allow Project W Risk Management to track risk as they impact project milestones.</p>	<p><u>Level 2 – Initial</u></p> <p>➤ Minimal qualitative analysis used to support quantitative assessment.</p> <p>➤ The program/project has recurring risk management activities (Program Management Review, Risk Team Meetings, CRM Training, Risk Mitigation Planning, etc.)</p> <p>➤ Minimal risk mitigation planning and tracking.</p>