



NASA Integrated Risk Management Process

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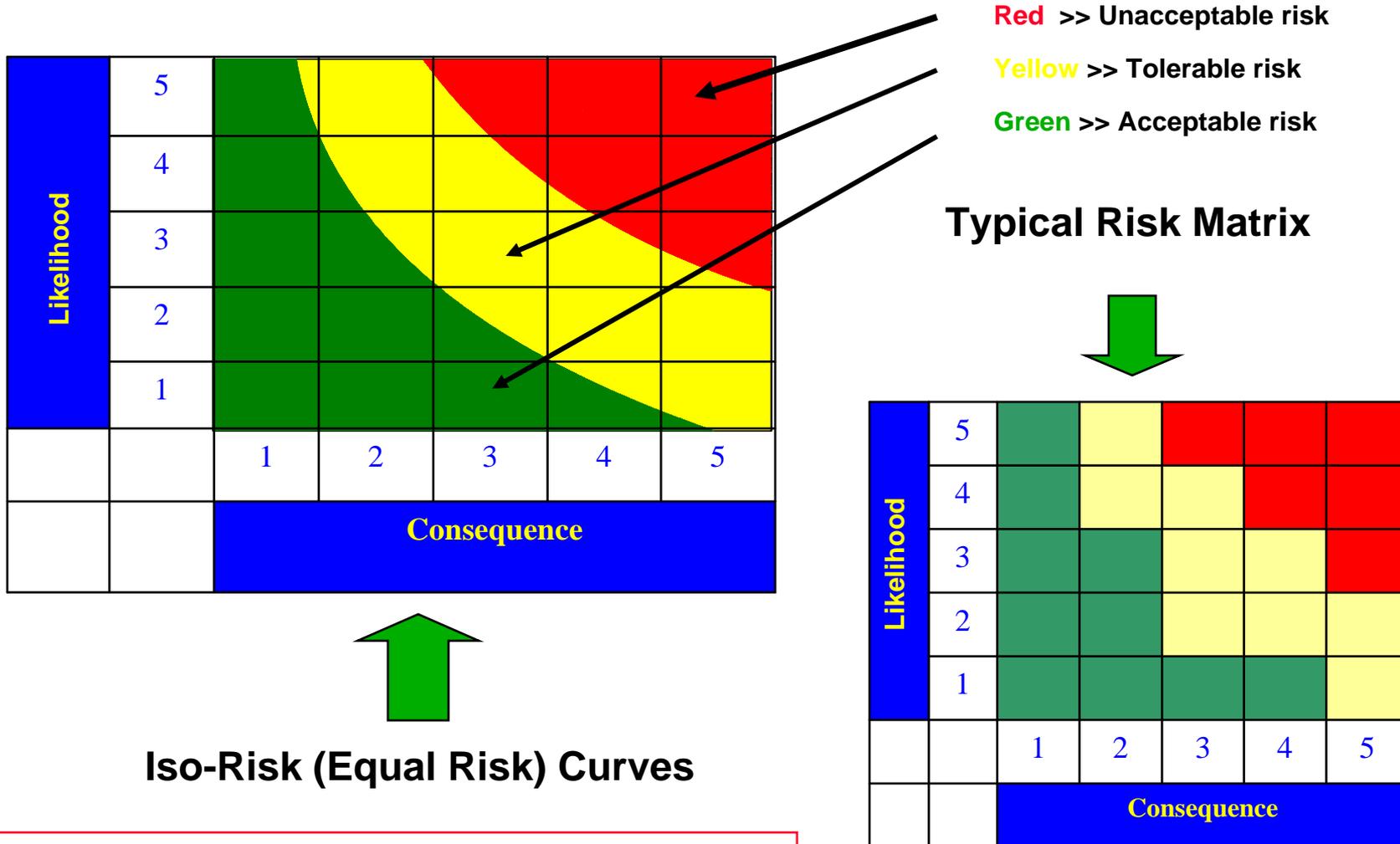


Risk Management

- ***Risk Management (RM) is a systematic approach to set the best course of action under uncertainty by identifying, understanding, assessing, acting on, and communicating risk issues.***
- Risk management is a **proactive, risk-informed approach to enable and enhance the decision makers' effective selection of key decision alternatives with implementation and follow-through**



Risk Matrix with Zones of Acceptability





NASA Integrated Risk Management (IRM)

- Risk in the context of mission and strategy
- Risk “**portfolio**” development including
 - Safety risk
 - Technical risk
 - Technological risk
 - Operational and infrastructure risk
 - Schedule risk
 - Cost risk
 - Other type of risk
- Focus on critical risks, their interactions and integration
- Risk control strategy
- Risk monitoring and measurement



Integrated Risk Management Objective at NASA

Integrate all types of risk assessment and management in the Agency into a coherent system that enables and supports improved risk-informed management decisions



NASA IRM Principle

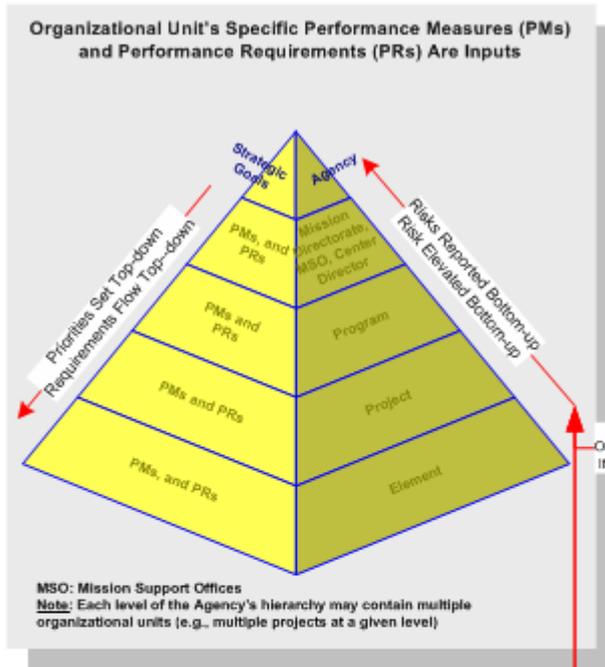
- *Program and project requirements are rigorously coupled to Agency goals in order to support the stated Agency IRM objective*
- The RM framework extends this principle to couple Risk Management explicitly to the performance measures and associated requirements established for mission directorates, programs and projects in a hierarchical fashion.
- This framework is evolutionary in that it uses the continuous risk management (CRM) process that NASA has had for some time

Risk Management within NASA Hierarchy



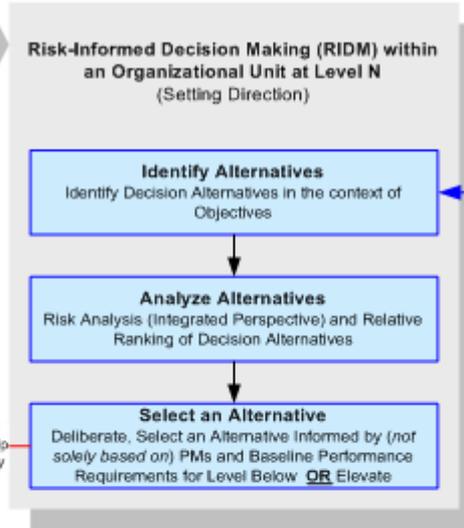
a

Organization hierarchy



b

Risk-Informed Decision Making (RIDM) Process



c

Continuous Risk Management (CRM) Process





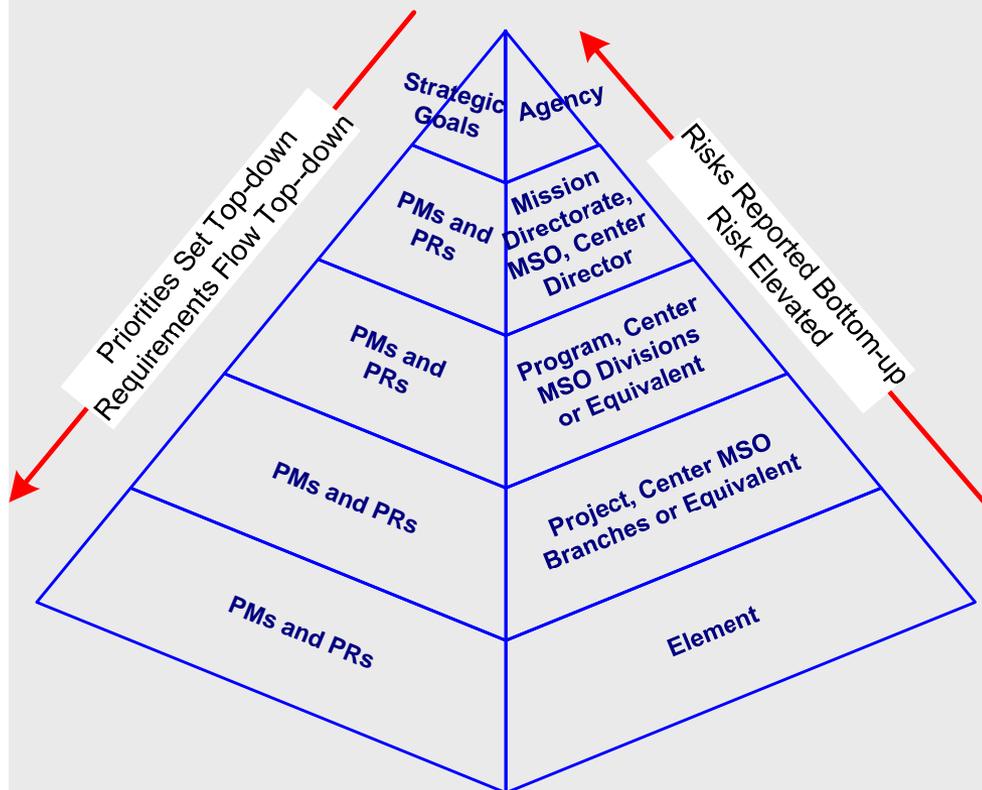
Key Definitions

- **Performance Measure** – A metric used to characterize the performance of a system, process, or activity in fulfilling one of its intended objectives
- **Performance Measure Threshold** - A level for a performance measure that, when exceeded, “triggers” management processes to rectify undesirable performance.
- **Performance Requirement** - The value of a performance measure to be achieved by an organizational unit’s work that had been agreed-upon to satisfy the needs of the next higher organizational level



(a) Organizational Structure

Organizational Unit's Specific Performance Measures (PMs) and Performance Requirements (PRs) Are Inputs



MSO: Mission Support Offices

Note: Each level of the Agency hierarchy may contain multiple functional units (e.g., multiple projects at a given level).

- ✓ Each organization unit at a given NASA level negotiates with units in the level below a set of deliverables, performance measures, performance requirements, resources, and schedules for the tasks to be performed by the unit.
- ✓ The lower level organization unit manages risks against these specifications and, as appropriate, elevates risks to the higher level.
- ✓ The approach is **performance based**, i.e., each unit determines the best way to achieve its performance requirements.
- ✓ Risks may be elevated up in stepwise progression.
- ✓ Each organization unit oversees the risk management of the units at the lower level and manages the risks at its own level



(b) Risk-Informed Decision Making (RIDM)

Risk-Informed Decision Making (RIDM)
Within an Organizational Unit at Level N
(Setting Direction)

Identify Alternatives

Identify Decision Alternatives in the context of Objectives



Analyze Alternatives

Risk Analysis (Integrated Perspective) and Relative Ranking of Decision Alternatives



Select an Alternative

Deliberate, Select an Alternative Informed by (*not solely based on*) PMs, and Baseline Performance Requirements for Level Below **OR** Elevate



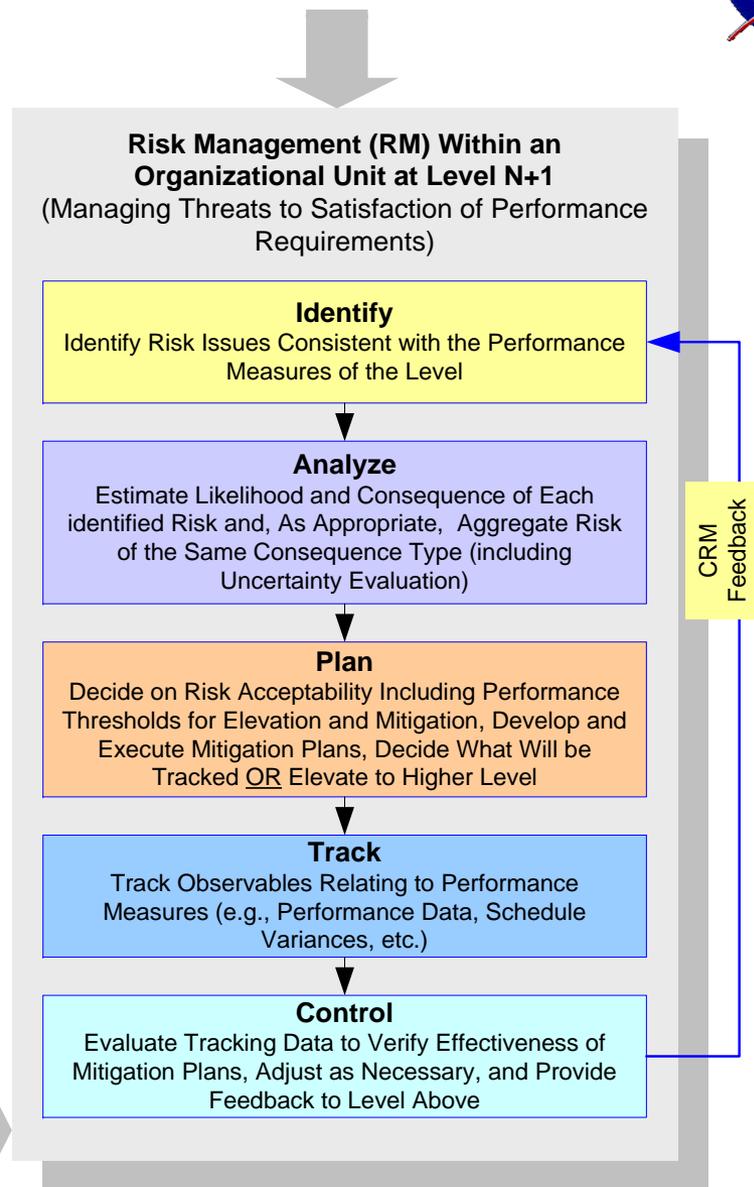
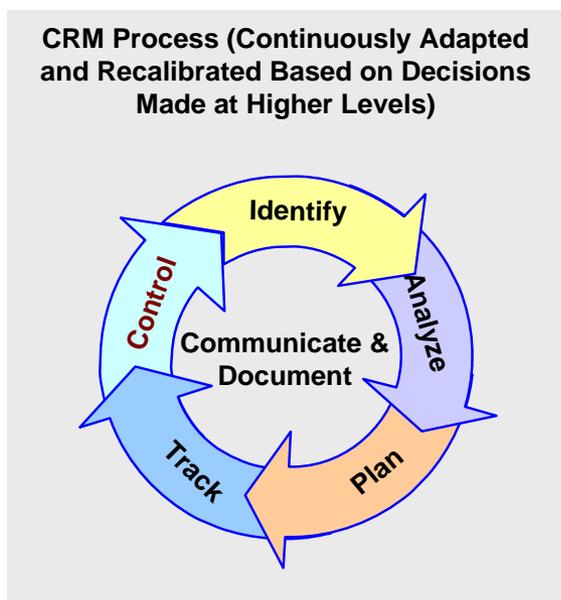
In this process, decisions that impact lower level entities are analyzed. When a risk informed alternative is selected, the performance measure (PM) values underlying the decision define “success.” Stated differently, this success becomes the baseline performance requirement for the lower level entity.



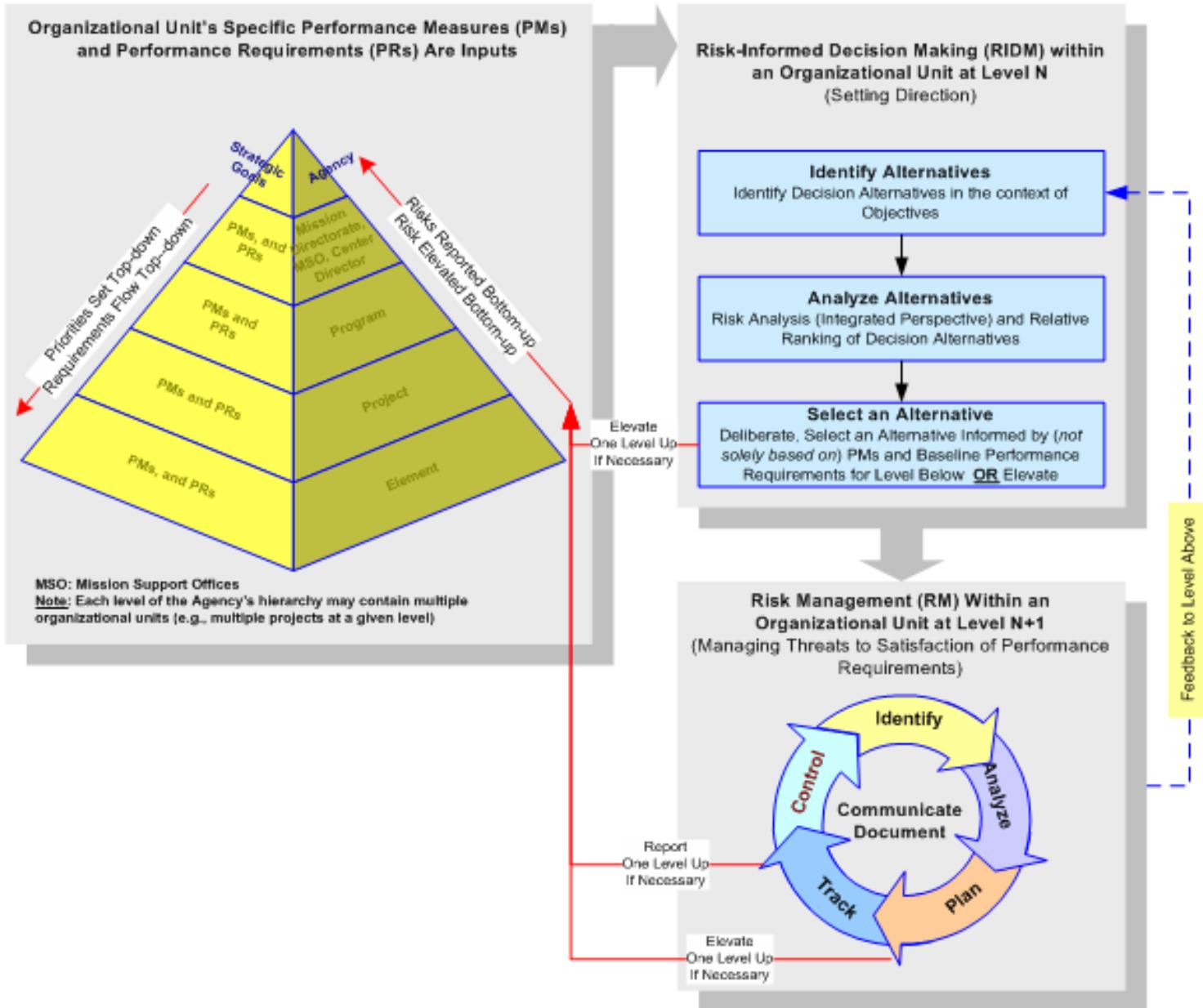
(c) Continuous Risk Management (CRM)

The CRM process is applied within an organization unit at a given level of the organization hierarchy.

The scope of this activity comprises “risks” that threaten the accomplishment of baseline performance requirements determined through a RIDM process at the higher level.



RM Integration in NASA Hierarchy



NASA RM Document Structure

