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DEFINING THE FUTURE

Relationship Between Risk Management and Project Performance

7th Annual NDIA CMMI Technology Conference
#5527

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Systems Engineer
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- **Over the last 30 years, risk management has grown from a distant voice to a major contributor to project success**
- **Implementation of risk management on projects has produced varying degrees of success due to missed opportunities to maximize return on investment**
- **This presentation examines some problems experienced by projects implementing risk management and some techniques used by the author to address them**

The Evolution of Risk Management on Projects I Have Known

Pitfalls in Implementing Risk Management on Projects

How To Get the Most Out of Implementing Risk Management

Some Results, Measures and Lessons Learned

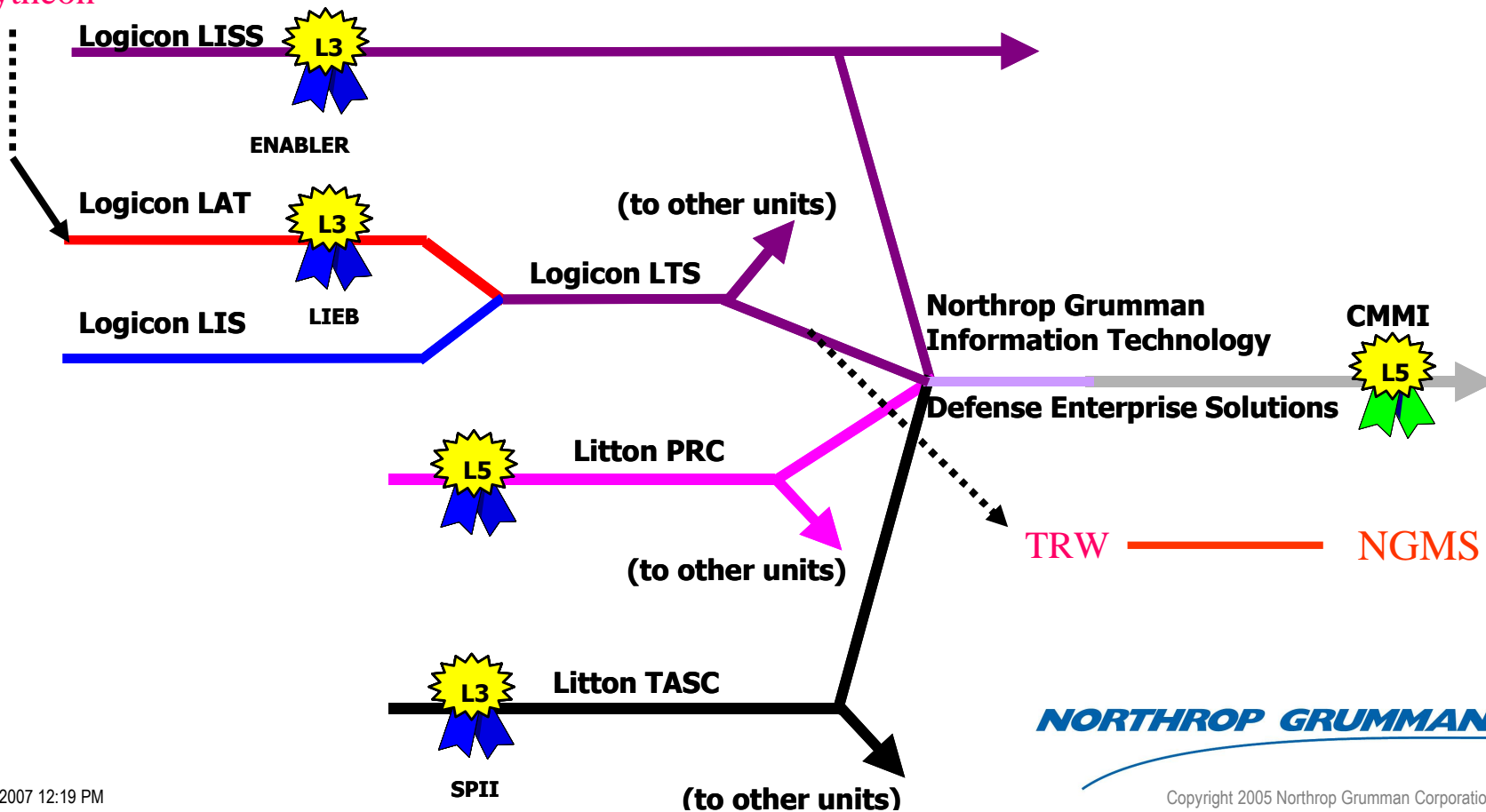
How to Present My Credentials

Westinghouse 1970 --> NGES

Hughes Aircraft / Radar 1981

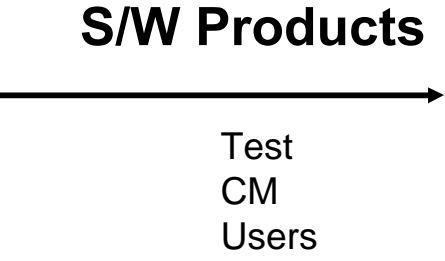
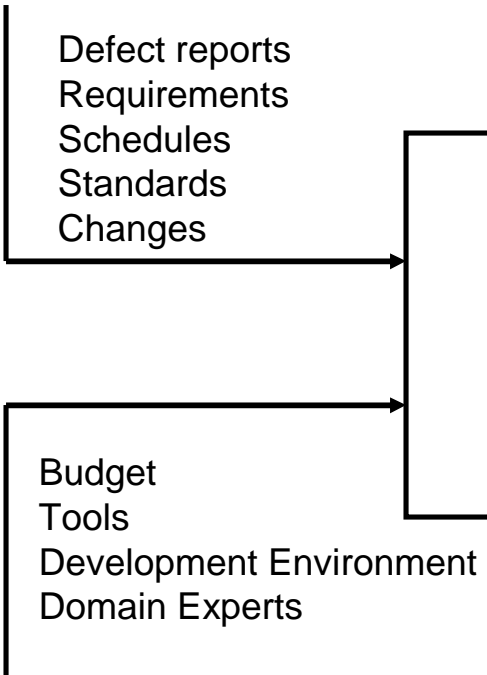


Raytheon

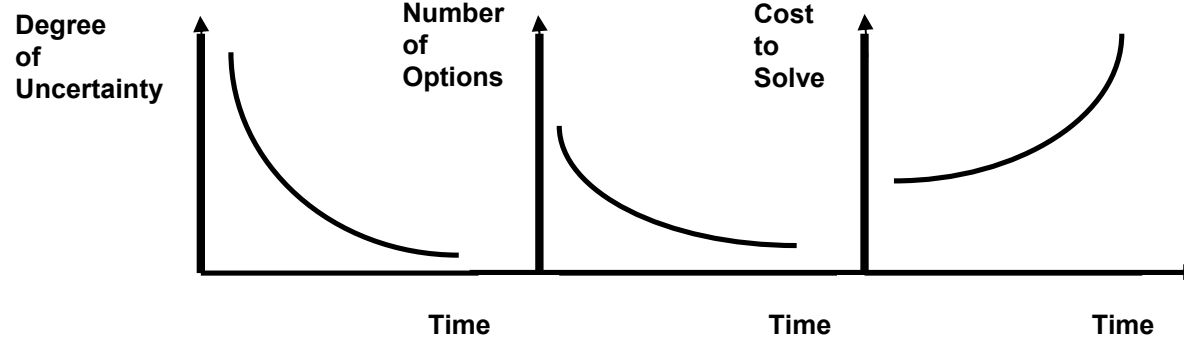


and Often

External Inputs



External Resources



“... some maladies, as doctors say, at their beginning are easy to cure but difficult to recognize...but in the course of time...become easy to recognize but difficult to cure.”

Machiavelli, 1512

from CMM to CMMI

**LEVEL 3
DEFINED**

Organization Process Focus
Organization Process Definition
Training Program
Integrated Software Mgmt

Software Product Engineering

Intergroup Coordination
Peer Reviews

Organization Process Focus
Organization Process Definition
Organizational Training
Integrated Project Management

Risk Management

Requirements Development

Technical Solution

Product Integration

Verification

Validation

Decision Analysis And Resolution

**LEVEL 2
REPEATABLE**

Requirements Management
Software Project Planning
Software Project Tracking & Oversight
Software Subcontract Mgmt
Software Quality Assurance
Software Configuration Mgmt

Requirements Management

Project Planning

Project Monitoring And Control

Supplier Agreement Management

Product & Process Quality Assurance

Configuration Management

Measurement And Analysis

Manager's Dilemma at Level 3

***I want to use the organization's
standard process, but...***

**... Does it's performance and
quality meet my customer's
expectations?**

- **Most customers care about:**
 - Delivered defects
 - Cost and schedule

**... If not, how should I tailor the
process?**



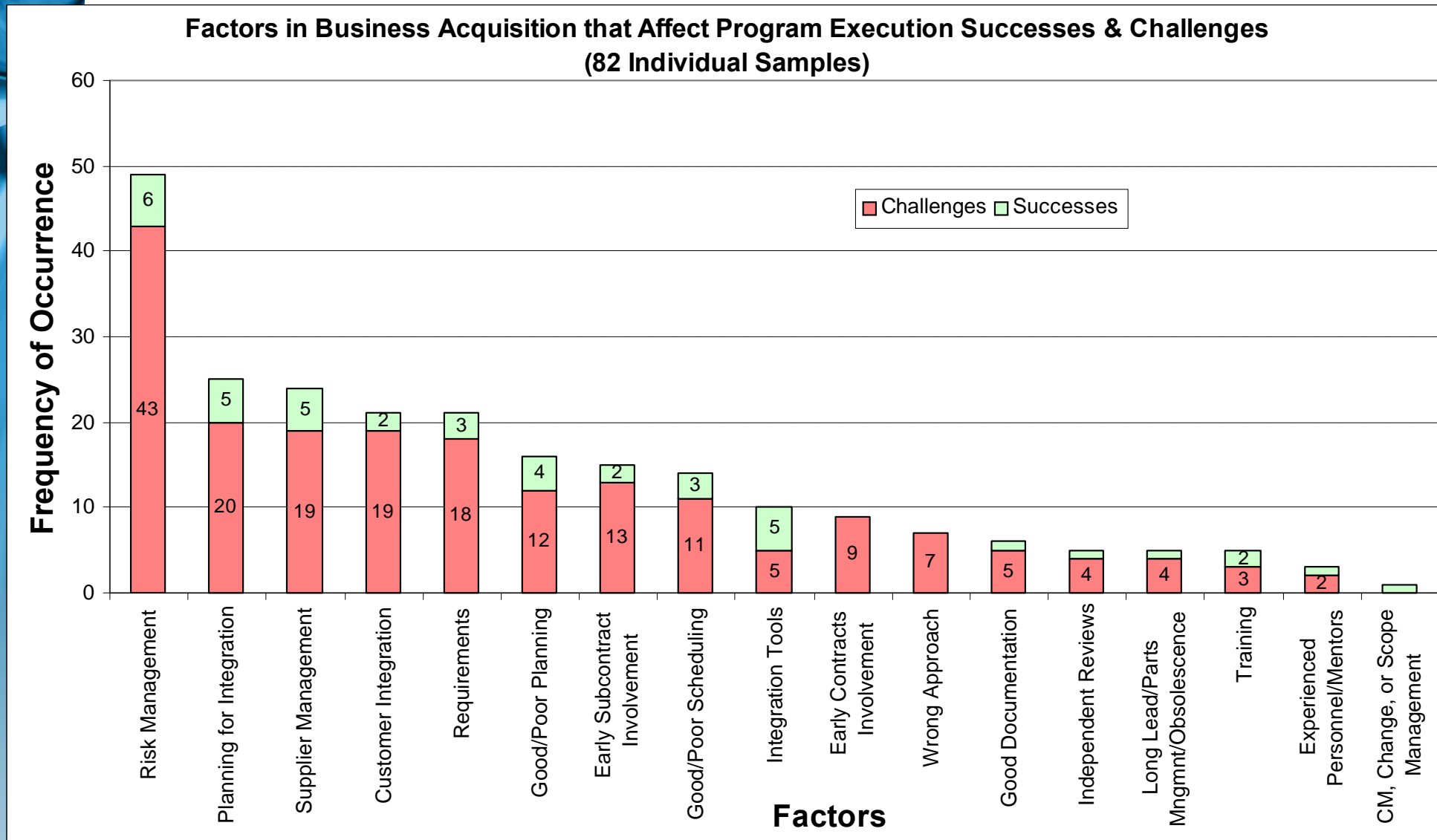
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Managers See Risk Management as High Impact on All Program Phases

	PRE-PROPOSAL PROPOSAL	PROGRAM INITIATION	PROGRAM EXECUTION
Scope Management	4	6	9
Cost Management	4	4	9
Schedule Management	6	7	8
Risk Management	6	7	9
Quality Management	3	3	4
Integration Management	6	8	9
Subcontract Pgm. Management	6	7	7
Communications Management	5	5	5
Tech Performance Management	6	9	7
Issue Resolution Management	2	4	4

Where 9 is a high impact Critical Need that can be remediated by L&D

Management is Almost Twice as Likely to Help as the Next Best Factor



Company at Risk of Not Managing Optimal Level?

- **Lacking Senior Management sponsorship**
- **Lacking a risk management a plan**
- **Lacking training**
- **Lacking an open atmosphere for communication**
- **Lacking a wide perspective**
- **Lacking sufficient risk identification documentation to support the analysis step, including clear statement of risk context**
- **Lacking more than just risk identification - need a complete implementation**
- **Lacking meetings on a regular basis**
- **Lacking flowed down to teammates, subcontractors, and vendors**

Ingness or Inability to Predict is a Major Handicap

- **“Not a single company that made vacuum tubes makes semiconductors today”**
- **Forewarned is forearmed “to enhance the positive and minimize the negatives”**
- **“It’s obviously an art. And it’s not unscientific”**
- **“If you’re managing anything, you had better prepare for things changing”**
- **“You can’t wait for things to happen and then react”**

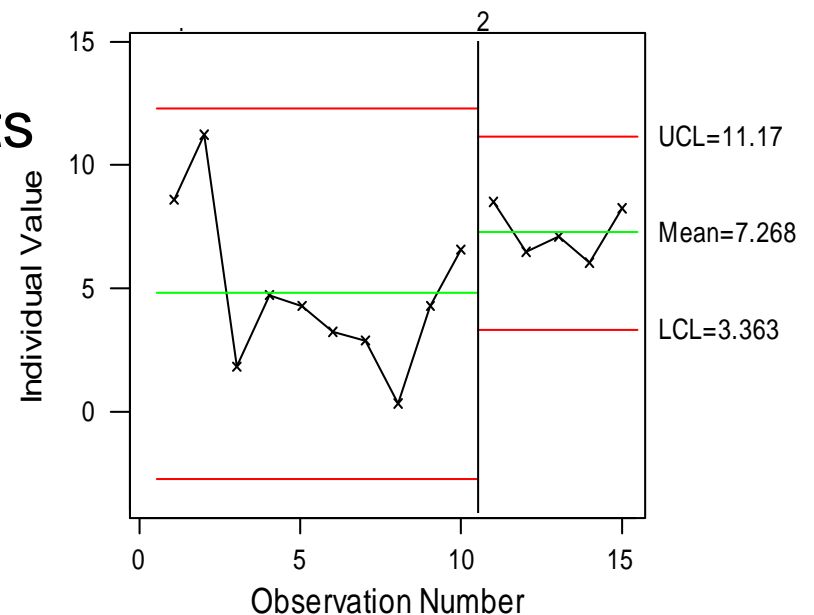
Quotes attributed to Simon Ramo, the R in TRW, by the Daily Breeze Business section
September 15, 2007

Risks is much easier at CMMI

- **Much of the hard work in establishing a foundation is finished, with plenty of room to grow**
 - Risk Management is now up and running smoothly, and can be integrated into other well-understood Process Areas
- **Innovative process improvements are readily available for implementation**
 - Lean Six Sigma processes are easily imported from other practitioners and projects
- **Level 4 and 5 project activities make available information for use in identifying goals and their risks**
 - Meaningful metrics and interaction with stakeholders reveal places where risk can be identified and managed
- **The project, management, and individuals realize real benefits from Level 4 and 5 operations**
 - Level 4 metrics increase moral by showing progress towards goals while Level 5 activities improve the work environment

be Used to Get Ahead of the

- **Easier to catch problems before they actively attack your project via Risk Management and stakeholder involvement**
- **Level 3 firmly in place**
- **Now one can reduce the variation**
 - Train people
 - Create procedures/checklists
 - Strengthen process audits
- **Increase the effectiveness (increase the mean)**
 - New/enhanced processes
 - Reduce waste and re-work
 - Replicate best practices



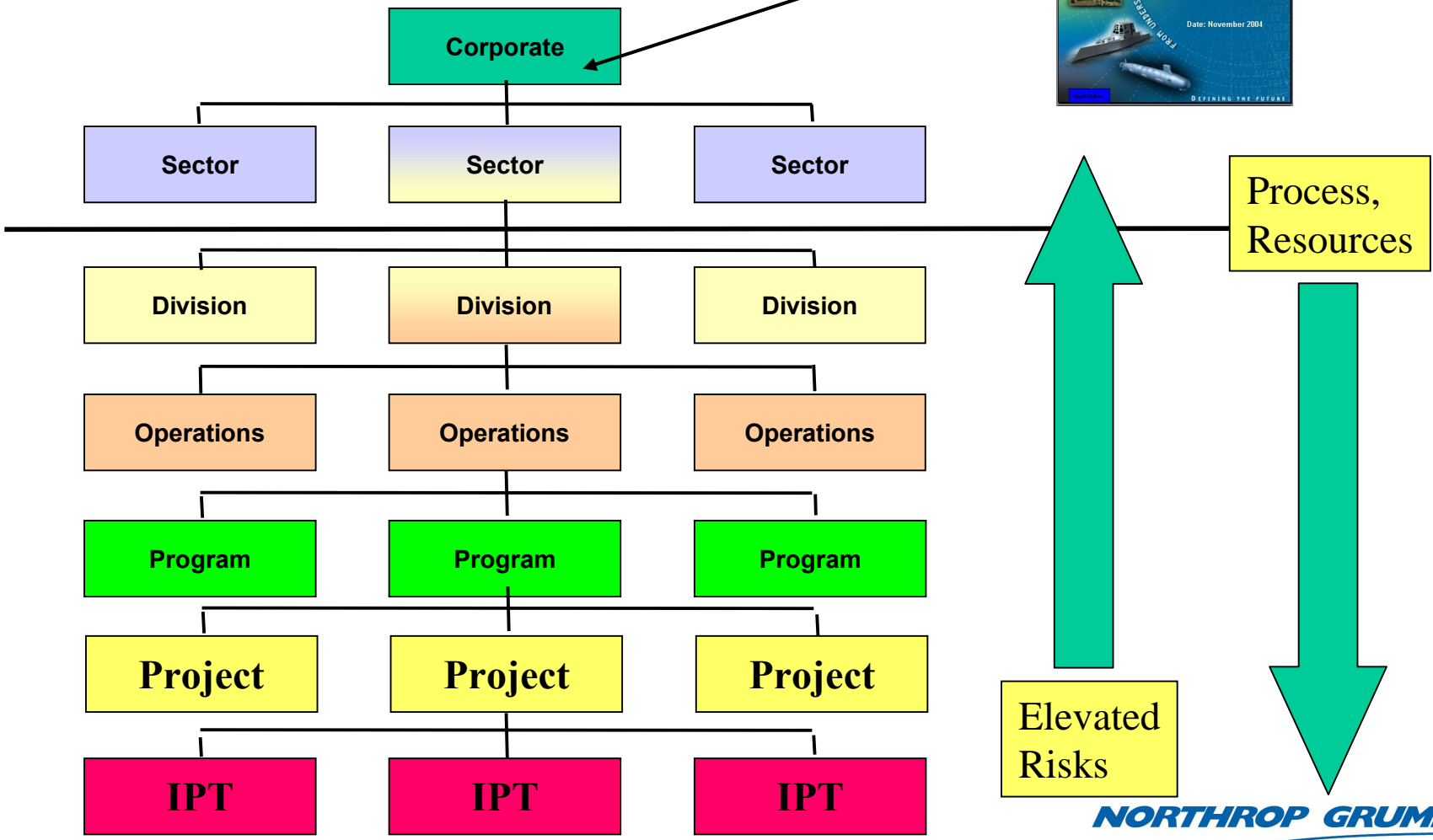
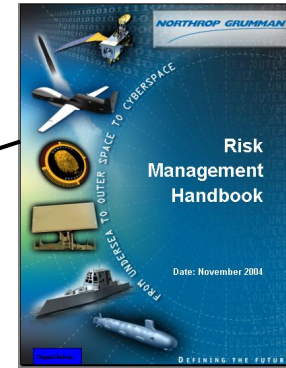
Revolutionary Process Capability
Improvement

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Tier is to See With New Eyes

- **Process improvement is built into the system**
 - Every success allows a project to be even more successful through lessons learned and adding value
- **The culture has changed**
 - Risk Identification and Handling is expected, Opportunity Identification and Exploitation is welcomed
 - People are more willing to talk and work as a team
- **It gets easier each time**
 - Less dependence on risk source list
 - Been there, done that
 - Can now explore uncharted areas formerly ignored

Main Flow of Communication with Management



Together Provides the Project a ts Universe

Risk Management is important at all levels (including Customer and Suppliers)

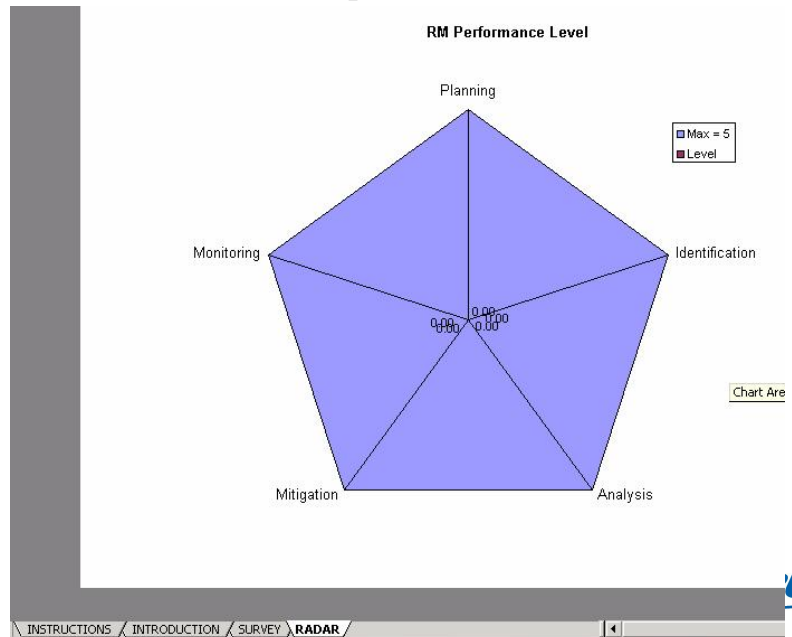
- Emphasize the importance of not ignoring risks
 - **Do not just accept risks**
 - Realize the value in proactively managing them
- **Comprehensive identification of risks is key**
 - Everyone should be involved - engineers and **support personnel** see different risks than managers do.
- **NGC and suppliers** must understand the customer's perception of the risks and shape the customer's perception of NGC risks
 - Lack of communication creates risks
- **Customers** are becoming more insistent on good risk management as a major factor in acquisition selection
 - Good risk mitigation strategies are excellent proposal discriminators



- Risk Scoring Matrix is currently the best snap shot
- Risk exposure (dollars at risk) are useful for prioritization, but does not provide good visibility if not tied into IMP/IMS or EVMS
- Maturity Spider Chart provides a measure of how well the risk management process is operating
- CMMI assessments provide an independent view

Probability of Occurrence	5 Near Certainty	Yellow	Yellow	Red	Red	Red
	4 Highly Likely	Green	Yellow	Yellow	Red	Red
	3 Possible	Green	Yellow	Yellow	Yellow	Red
	2 Unlikely	Green	Green	Yellow	Yellow	Yellow
	1 Remote	Green	Green	Green	Green	Yellow
			1 Negligible	2 Minor	3 Moderate	4 Substantial
		Consequences of Occurrence				

Risk Level Color Legend		
Red	Yellow	Green
High Exposure	Medium Exposure	Low Exposure



Management Produces Qualitative of Improvement on Projects

Risk Management

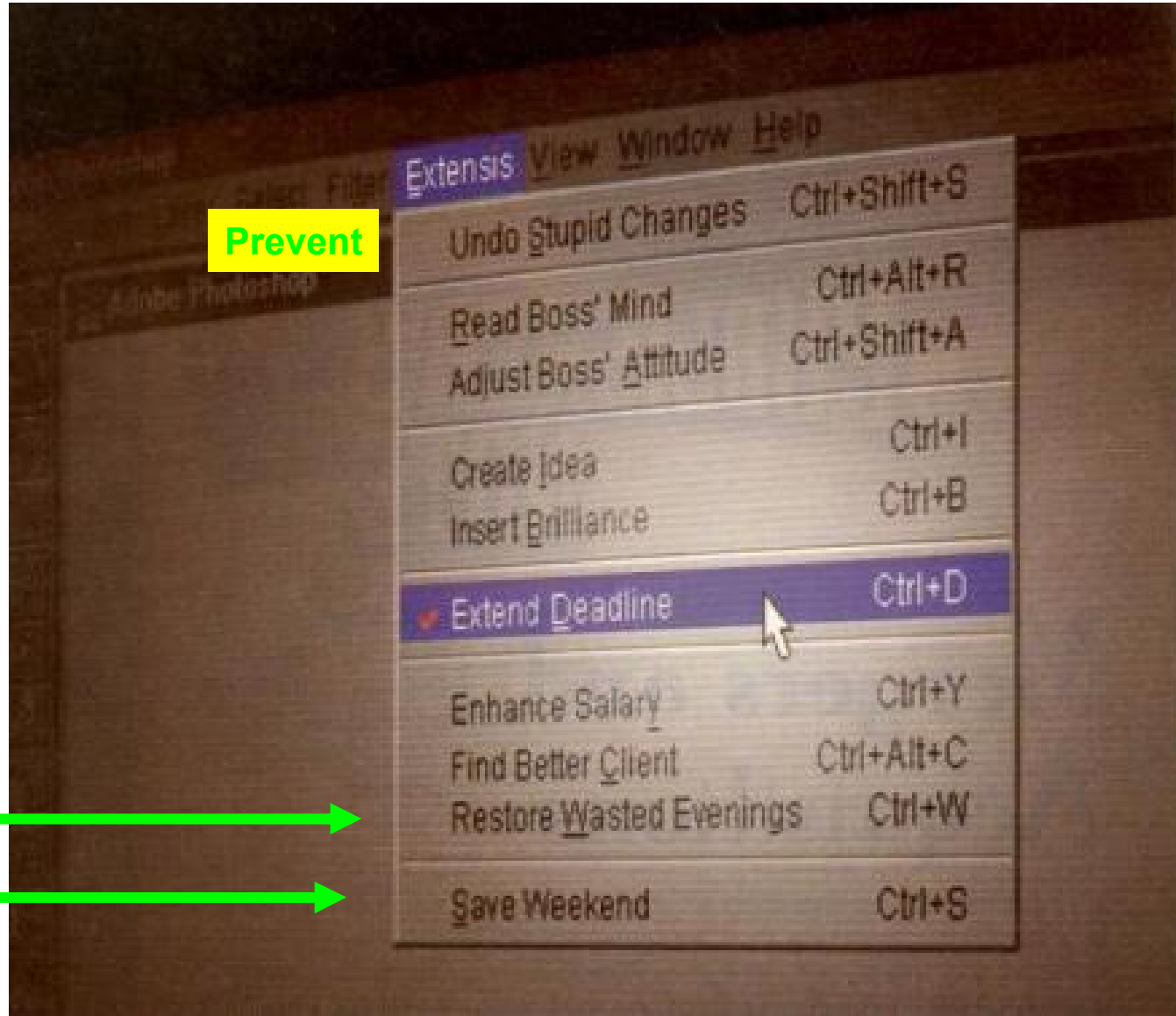
Vs

Crisis Management

- ” Problems Foreseen
- ” In Control
- ” Calm
- ” Pay **Less** Now, Save Later
- ” Delivery Ahead of Schedule
- ” Proactive
- ” Lessons Learned Utilized
- ” Preventive: Per agreements
- ” Exploit Opportunities
- ” No Casual Overtime Required

- Blind Sided by Surprises
- Hope for the Best
- Periodic Panic
- Pay **More**, Later (Unplanned)
- Late Deliveries
- Reactive
- History repeated
- Corrective: Rework
- Regret Lost Opportunities
- Late Nights and Weekends

ement Well Done Produces ns to the Individual



Gains

- **Less stress**
- **Added slack to cost and schedule curves**
 - Fewer replan exercises
 - Easier to give back resources
 - Easier to help other projects
- **Better understanding of how to get job done**
- **Less time doing rework**
- **No surprises as concerns are escalated more quickly to the proper level of attention**
- **Other projects consulting to find out why things were going so well**

- **More up front thinking means less work later**
- **Produces more value-added products with reduced effort and time**
 - Instead of overrunning budgets and schedules, products are delivered early and on budget
 - Extra deliveries are possible without strain
- **Needed less “help” from senior management but got more resources**
- **Lots of new work pours in**
- **Communications with other groups is easier**

- **Strong - overwhelming! - management support is helpful but not necessary**
 - Working risk management bottoms up is difficult, but possible
 - If you're going to implement, realize and prepare for the required resources
- **Training is essential**
- **Risk Owners should be assigned at the lowest level that affords subject matter expertise**
 - Use Subject Matter Experts and push to the lowest level - with the correct amount of oversight
- **Use a board and meetings devoted specifically to RM**
- **Make it a Universal way of doing business**
- **View the project as a system, not a collection of components**

