Ensuring the Success of a High Reliability Organizations

Setting Clear Expectations, On-site Oversight, and Collaborative Supply Chain Interactions

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Some Disasters Can’t Be Avoided
Some Can
It’s Hard, but Certain Avoidable Events Must Never Be Allowed to Happen on Our Watch
Mid-Air Collisions

Kazakhstan Flight 1907 Vs Saudi Arabian Flight 763
Melt-Down

The Nuclear Accident
Radiation Continues To Leak From Crippled Plant

HARRISBURG, Pa. (AP) — Radiation leaks from the Three Mile Island nuclear power plant continued today, authorities said, as a debate grew over what was described as one of this country’s most serious such incidents in its history.

“The vapor that is now going into the atmosphere is from a sump pump and is only mildly radioactive within accepted limits,” said Don Curry, a spokesman for the Metropolitan Edison Co., owner of the plant. The pump is designed to remove water after it has cooled the reactor.

“We concede that it’s not just a little thing,” Curry said. “In terms of publicity it will probably surpass the Browns Ferry incident.”

Until now, a March 1976 fire in the control room of the Browns Ferry nuclear plant in Alabama has generally been considered this nation’s most dangerous incident involving a nuclear reactor.

Low level radiation was detected in the air as far as 16 miles away after an apparent valve failure Wednesday morning resulted in excessive pressure being built up in the water used to cool the reactor core at Three Mile Island.

“Some of the water vapor, through the venting system, went into the atmosphere,” Curry said.

Curry said the latest radiation measurements outside the plant were at two to three millirems. Individuals are exposed to up to 30-millirems in a single X-ray examination.

Walter Creitz, president of Metropolitan Edison, said an ABC-TV’s Good Morning America show this morning that the plant shut down safely and that the level of radiation released “would not endanger or injure any people.”

Creitz said his company did not know what equipment had been disabled or what precisely caused the accident.

An aerial view of the Three Mile Island nuclear power plant.
...Some Things Are Harder to Avoid, yet Less Acceptable Than Others
High Reliability Organizations

- When failure is truly not an option, the entities responsible for preventing failure must become High Reliability Organizations (HROs).

  Examples:
  - Air Traffic Control Systems
  - Nuclear Power Plants
  - The Centers for Disease Control and Prevention
  - The Missile Defense Agency

- For HROs, a cookie cutter approach to Mission Assurance is not enough.
- Each HRO must develop its own Concept of Operations (CONOPs) to ensure mission success.
- Since the mission of each HRO affects us all, it is incumbent upon us to share our tools and approaches, so that each may borrow and modify techniques with a proven track record, as needed.
Ballistic Missile Defense

- The Missile Defense Agency is an Acquisition Agency.

- Our task is to provide the Warfighter with a robust, highly reliable Ballistic Missile Defense System to ensure the protection of the US Homeland and our allies from ballistic missile attack.

- We do not take this task lightly, and we have developed a layered Mission Assurance system to accomplish it.

- We would like to share our approach with you, and we would like to learn about yours.
Layered Mission Assurance

- Implementation of two tailorable requirements documents on all MDA contracts – the MDA Assurance Provisions (MAP) and the Parts, Materials and Processes Mission Assurance Plan (PMAP)

- On-site oversight including resident MDA Mission Assurance Representatives at critical suppliers, who also regularly visit lower tier suppliers, and Quality, Safety and Mission Assurance personnel who witness First Article Inspection/Test (FAI&T) activities

- Regular supply chain communication including face-to-face Quality Forums with multiple levels of our supply chains to share Lessons Learned and reinforce Best Practices
Why the MAP?

- MDA directive to improve Quality, Safety, and Mission Assurance (QSMA) disciplines and process rigor

- MDA Systems are complex and critical with unique considerations for:
  - Strategic mission
  - Integration & interoperability
  - Deployment of development assets

- Mission success depends on a rigorous application & control of QSMA disciplines
DoD Recognition of the MAP

"Program managers should consider the use of additional requirements (such as those contained in the Missile Defense Agency Assurance Provisions) beyond ISO 9001 as appropriate." (Section 11.3.3.1)
Why the PMAP?

High Reliability PMP begins by fully understanding all characteristics and capabilities of each part and material, followed by testing to assure performance under worst-case conditions, and application with margin for all known operational limits.

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<td>Use of Standard Parts</td>
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<td>Qualification Testing over Temperature, Shock, Vibration</td>
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<td>Destructive Physical Analysis</td>
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DoD Recognition of the PMAP

High-Reliability PMP Guidebook

“MDA’s PMAP is the best high reliability PMP plan in DoD” [paraphrased]

Office of Secretary of Defense, Standardization Program Office
MDA Assurance Representatives

Current MAR Locations

Northrop Grumman
Salt Lake City, UT

Orbital ATK
Magnie, UT

MDIOC
Colorado Springs, CO

Eagle Picher
Joplin, MO

Raytheon
Andover, MA

Raytheon
Woburn, MA

Lockheed Martin
Moorestown, NJ

Orbital ATK
Elkton, MD

Boeing
Raytheon
Huntsville, AL

Orbital ATK
Huntsville, AL

Huntsville, AL

Lockheed Martin
Courtland, AL

Aerojet Rocketdyne
Sacramento, CA

Pacific Scientific
Hollister, CA

Vandenberg AFB

Pacific Scientific
Honeywell
Chandler & Tempe, AZ

Orbital ATK
Chandler, AZ

Ft. Greely, AK

Raytheon
Tucson, AZ

Aerojet Rocketdyne
Raytheon
Lockheed Martin
Camden, AR

Aerojet Rocketdyne
Raytheon
Lockheed Martin
Camden, AR

Raytheon
Orlando, FL

12-21-2015
The Missile Defense Agency (MDA)/Industry Quality will convene on a recurring basis to ensure industry-wide understanding and implementation of the MDA Quality requirements, as set forth by the MDA Director enforced by the MDA QS Director. Membership includes key Government and aerospace industry Quality leaders knowledgeable of quality enterprise strategic planning, Quality Management System (QMS) requirements/implementation, and knowledge of their companies’ Missile Defense programs.

Objectives:

- Review and discuss the MDA Quality policies and strategies set forth by the MDA Director to make certain implementation facilitates mission success.

- Identify, discuss and resolve significant, systemic issues affecting MDA programs and other government agencies.

- Collaborate on Quality improvement plans/initiatives