

Safety Culture Workshop



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The US Navy's Submarine Safety Culture



UNCLASSIFIED: Distribution Statement A

U.S. Navy's Submarine Safety Culture



While engaged in a deep test dive approximately 200 miles off the northeast coast of the United States,

USS THRESHER was lost at sea with all aboard

112 Officers and Enlisted; 17 civilians



U.S. Navy's Submarine Safety Culture



- The purpose of the SUBSAFE Program is to provide “maximum reasonable assurance” of:
 - Hull integrity to preclude flooding
 - Operability and integrity of critical systems and components to **control** and **recover** from a flooding casualty



U.S. Navy's Submarine Safety Culture



- **Responsibility**

- A duty, obligation, or burden

- **Accountability**

- The state of being answerable for one's actions (implies consequences)

- **Integrity**

- Rigid adherence to a code of behavior



U.S. Navy's Submarine Safety Culture

The Fundamentals



- **Work Discipline**
 - Knowledge of and Compliance With Requirements
- **Material Control**
 - Correct Material Installed Correctly
- **Documentation**
 - Design Products (Specs, Drawings, Maintenance Standards, etc.)
 - Objective Quality Evidence (OQE)
- **Compliance Verification**
 - Inspections, Surveillance, Technical Reviews, Audits
- **Separation of Powers**
- **Continual Training**



U.S. Navy's Submarine Safety Culture Compliance Verification



- **Multi-layered approach**
 - Contractor/Shipyard/Activity responsibilities
 - Inspections, Surveillances, Document Reviews, Audits
 - Local government oversight authority responsibilities
 - Inspections, Surveillances, Document Reviews, Audits
 - Headquarters responsibilities
 - Document Reviews, Audits
- **Multi-faceted approach**
 - Ship Certification Audits
 - Facility Functional Audits



NAVSEA
Headquarters

U.S. Navy's Submarine Safety Culture

Compliance Verification



USS TUCSON

- **SUBSAFE Certification Audits:**

- Ship Specific
- A critical element for certification for sea trials and unrestricted operations

- **SUBSAFE Functional Audits:**

- Facility specific review
 - Policies
 - Procedures
 - Practices
- Verifies organizational compliance with SUBSAFE Program requirements



Portsmouth Naval Shipyard



U.S. Navy's Submarine Safety Culture



Controlling Work Aboard US Navy Submarines

- Only Qualified and Authorized Firms work on submarines and DSS systems
- In 1996 heavy workloads created a capacity shortage among submarine yards
- NAVSEA established instructions to qualify a firm to do submarine work
- Focus of controls is on repair and maintenance work performed onboard the submarine, rather than components worked at suppliers facilities



U.S. Navy's Submarine Safety Culture



Controlling Work Aboard US Navy Submarines cont.

- Suppliers of new material and Original Equipment Manufacturers are exempt
 - Procurement process for these organizations ensures compliance
- Navy wide notice is issued annually listing authorized firms and yards
- A functional audit of each authorized activity is conducted every two years
- Firm remains on the list provided the audit results are satisfactory



U.S. Navy's Submarine Safety Culture



Internal Audits

- Prior to any NAVSEA Functional or Certification Audit, each activity conducts an internal audit to self identify and correct any problems
- Allows them to gage their own knowledge, awareness, and compliance against future NAVSEA results

Self Assessments

- Each activity prepares a self assessment annually to report how the activity grades itself on compliance with the program requirements.
- Includes metrics derived from internal and external audit results, problem reports and root cause analyses, and submarine test report deficiencies

Trouble Reporting

- Each activity is required to report significant problems to alert the community so that they can establish preventive actions before those problems might occur elsewhere
- Underlying document is called a "critique" and includes a full analysis of the causes and corrective/preventive actions taken to resolve them.



U.S. Navy's Submarine Safety Culture

Compliance Verification



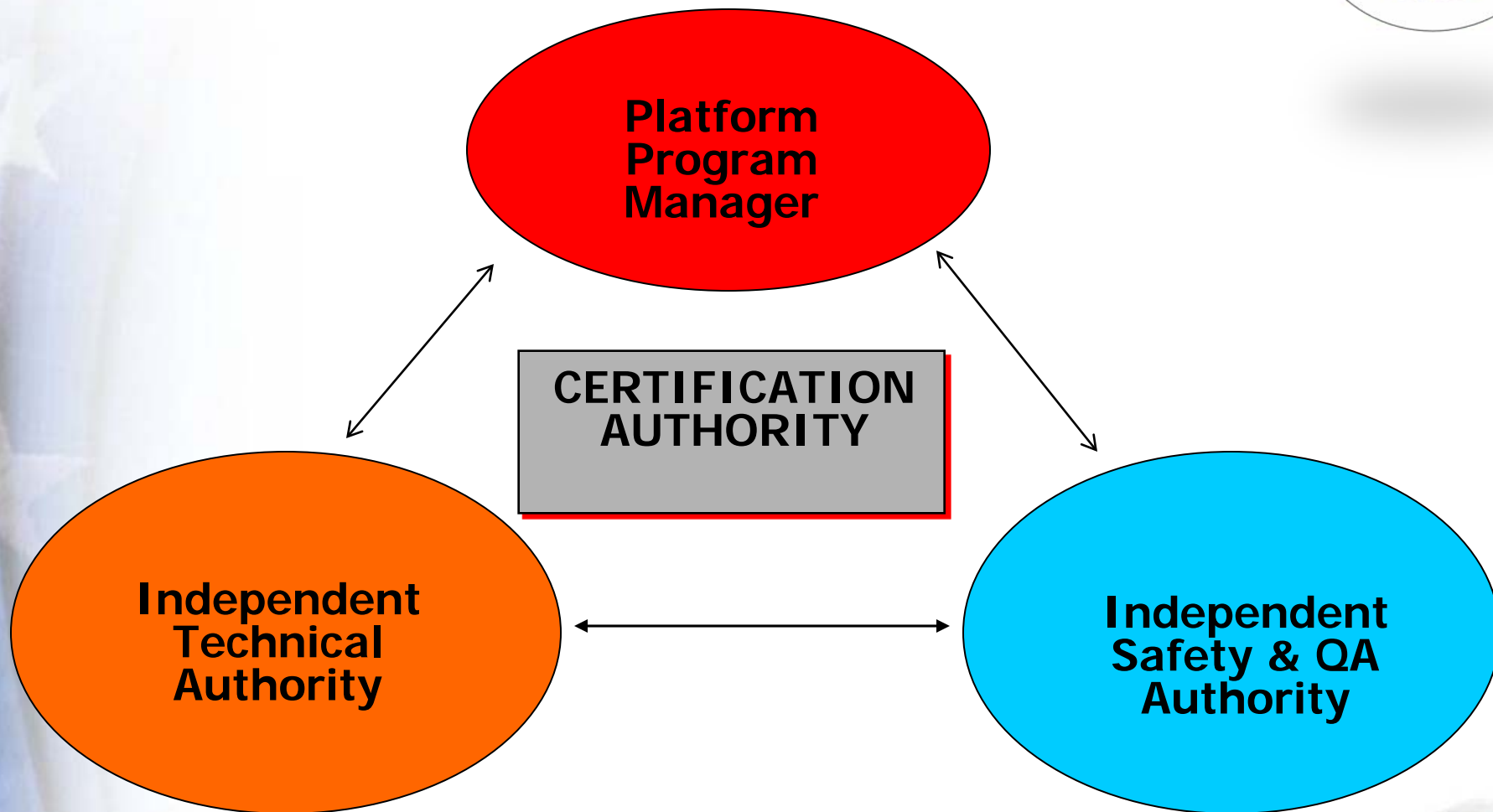
Why does the submarine Navy invest so much in compliance verification?

- Because the consequences of failure are unacceptable.
- Because the pressures of cost and schedule are great.
- Because an honest mistake can kill you just as dead as malpractice.



U.S. Navy's Submarine Safety Culture

Separation of Powers



U.S. Navy's Submarine Safety Culture Continual Training



- **SUBSAFE, DSS, & FBW Awareness Training is required for all personnel, from entry level workers to 3-star Admiral**
- **Annual Requirement**
- **Must achieve passing score on associated exam**
- **Training provides:**
 - Overview of the program and importance of program fundamentals
 - Reinforcement of compliance with requirements
 - Emphasis on proactively correcting and preventing problems
 - Recent lessons learned and a reminder of consequences of complacency



U.S. Navy's Submarine Safety Culture

Continual Training

THRESHER Anniversary



2008 – Gene Kranz

- NASA Flight Director for Apollo Missions
- “Failure Is Not An Option” – Apollo 13

2009 – VADM Bruce Demars (Ret)

- Former Director of Naval Nuclear Propulsion
- Spoke about importance of oversight and acceptance of responsibility



2010 – CDR John Dyer (Ret)

- Lead Engineer for NAVSEA Submarine Type Desk SUBSAFE support contract
- Spoke about the beginnings and formulations of the SUBSAFE program in the 1960's



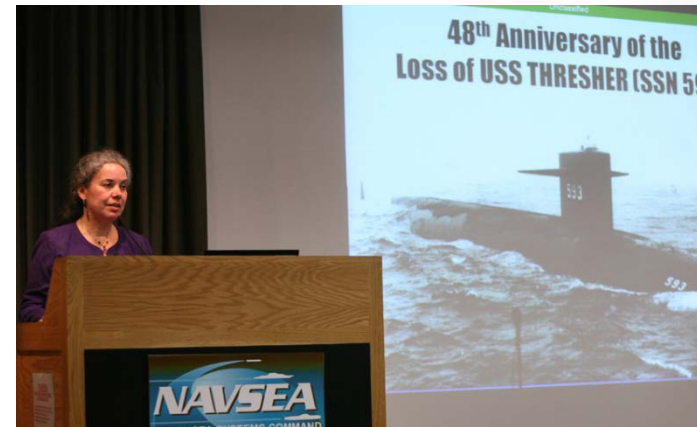
U.S. Navy's Submarine Safety Culture Continual Training



THRESHER Anniversary

- **2011 – Lori Arsenault**
 - Daughter of a USS THRESHER crewmember
 - Gave a personal perspective on the tragedy

- **2012 – CAPT Joseph F. Yurso (Ret)**
 - Former Commanding Officer of SOSG and PNS
 - Spoke about being a Shipyard Watch Officer when message came in that the USS THRESHER was lost
 - Discussed change in “quality control” after the tragedy and the importance of oversight



U.S. Navy's Submarine Safety Culture Continual Training



GRAYBACK Anniversary

- **2009 - CDR David Kelly**
 - Served aboard USS GRAYBACK
 - Provided retrospective on Diving Accident

- **2010 - CW04 Patrick Broderick (Ret)**
 - Former Underwater Demolition Team member who conducted Swimmer Delivery Vehicle operations from USS GRAYBACK
 - Gave the perspective as a teammate of the men lost onboard



U.S. Navy's Submarine Safety Culture Continual Training



GRAYBACK Anniversary

- **2011 - CAPT Keenan**
 - U.S. Navy's Director of Ocean Engineering, Supervisor of Salvage and Diving
 - Spoke about the chain of events before and after the Deepwater Horizon Oil Spill

- **2012 - Bryan Hughitt**
 - Manager of Quality Assurance at NASA's Office of Safety and Mission Assurance
 - Spoke about engineering failures with the Big Dig and Turkish Airlines Flight 981

The Naval Sea Systems Command
Proudly Presents:



CAPT Patrick Keenan
**USS GRAYBACK
DIVING ACCIDENT
RETROSPECTIVE**
Friday, 21 January 2011
0900-1000
NAVSEA Auditorium
Building 197, Washington Navy Yard



U.S. Navy's Submarine Safety Culture Continual Training



- **NAVSEA's Senior Manager's Workshop**
- **NAVSEA's School Of The Boat**
- **MIT's Submarine Concept Design Course**
- **Audit Outbriefs include Senior Level Representatives**
- **Training materials available to Field Activities upon request**
- **Open offer to Field Activities to provide trainings and briefs**



U.S. Navy's Submarine Safety Culture Challenges



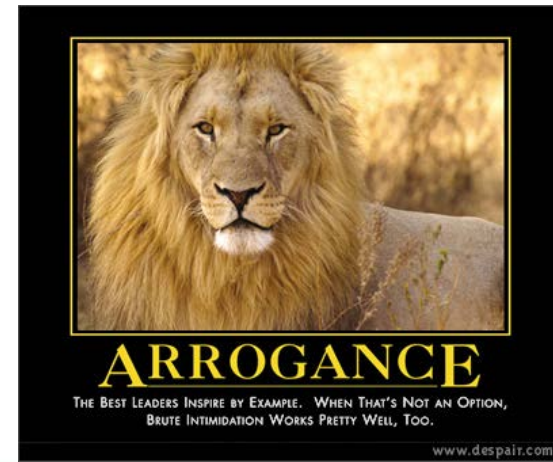
The U.S. Navy's Safety Program has a very successful history; however we must be aware of the program's greatest threats.



U.S. Navy's Submarine Safety Culture Challenges



- **Ignorance**
 - The state of not knowing
- **Arrogance**
 - The habit of behaving based on pride, self-importance, conceit, or the assumption of intellectual superiority and the presumption of knowledge that is not supported by facts
- **Complacency**
 - Satisfaction with one' s accomplishments accompanied by a lack of awareness of actual dangers or deficiencies



U.S. Navy's Submarine Safety Culture Challenges



- Declining Budgets
- Workforce Changes
- Fraud
- Short Memories
- Changing mindset of community without “Pinnacle Event”



A Final Thought



"Good ideas are not adopted automatically. They must be driven into practice with courageous patience."

"Once implemented they can be easily overturned or subverted through apathy or lack of follow-up...a continuous effort is required."

- Hyman G. Rickover



