



HARNESSING THE POWER OF TECHNOLOGY
for the
WARFIGHTER

***NSWC CRANE Battery Risk Reduction
Assessment Process
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NSWC Crane Background

- Indiana's Navy Base
- 100 square miles
- Unique facilities
- 140 People dedicated to battery operations
- Test/Evaluate milliwatt cells to 1.3MW batteries
- Technical Agent for Navy Lithium Battery Safety Program
- Several ISEA, TDA, EA positions
- Abuse testing to life cycle testing
- Battery RDT&E, Engineering, Qualification, Lot Acceptance Test, Surveillance, Proto-types, DPA
- Over 50 years of supporting Navy batteries and battery systems

NSWC Crane Risk Assessment Drivers

- 23 October 2012 Battery Fire
- Navy Class A Mishap
- NAVSEA SIB Directed



- SIB Findings/Issues
 - Not following documentation
 - Non-documented key decisions
 - Incomplete setup/training
 - Improper separation of duties causing conflicts of interest
 - Inadequate validation/certification processes
 - Poor Housekeeping
 - Under-estimated risks/hazards
 - Inadequate emergency planning





Became Complacent and Comfortable

Develop Plan

- Recover
- Improve/Change Culture
- Actively Address Risk
- Complete/Holistic Risk Coverage
- Reduce Risk Level To As Low As Reasonably Achievable
- Sustain

Actions

- Research/Select Structure
- Define Risk Plan
- Develop Risk Assessment Board
- Establish Standards
- Document Everything
- Develop Sustainment

- **SSP Risk Management Plan**
 - Planned Risk Management
 - Continuous (timeless) risk assessment
 - Emphasize technical risk
 - Document everything thoroughly
 - Continually re-evaluate process and risk
- **Provides Foundation for Risk Assessment Culture**

***SSP Risk Management Plan,
Risk Management Guide for DOD Acquisition,
Certification of Process Category Subject Matter Experts,
NSWC Crane Lithium Battery Safety Instruction***

Risk Assessment Process

- Gather program information
- ROMB meeting with minutes
- Procedure / HA Table development
- Appropriate procedure review
- Validations/Certifications/Hazard Briefings/Training
- Readiness Review
- Change Verification/Evaluation
- Follow up evaluation / lessons learned

- **Compile program information & initial risk assessment**
- **Hold Risk Oversight Management Board Meeting**
 - Chair Person Directed
 - Assess Vulnerable areas; Human Factors, Facilities/Location, Environment, Co-located Ops, Chemical, Equipment, Assets
 - Drill-down until risk levels are as low as achievable and acceptable
 - Generate minutes and 100% voting member approval
- **Generate Procedures/HA Table w/ appropriate review**
- **Process Category SMEs**
 - Operator training and certifications
 - Procedure Validation / Setups / Simulations
 - Hazard briefing

Risk Assessment Process

- **Operation Execution and Evaluation**
 - Process Changes with ROMB Chair Person oversight
- **Project post operation review**
 - Lessons learned
 - Finalize documentation
 - Maintain records

Risk Culture Change

- **Documented Process**
- **Establishment of two Cultural changing positions**
 - Board Chair Person
 - Process Category SMEs
- **These positions drive cultural change throughout Division**
 - Maintain the rigor



Questions

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Battery Hazards

- **Not simple single point hazard**
 - Electrical
 - Toxicity
 - Corrosive
 - Respiratory
 - Explosive gas generator
 - Deflagration
- **Potential for self driven**
- **Easy to stimulate without knowing**