U.S. Navy
Unexploded Ordnance Cleanup

Pacific Division Naval Facilities Engineering Command
Overview

- Background
- Definitions
- DoD/Regulatory Roles
- UXO Technologies
- UXO Working Group
- Navy UXO Quality Assessment Program
- Summary
- Points of Contact
Overview

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  - Definitions
  - DoD/Regulatory Roles
  - UXO Technologies
  - UXO Working Group
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- Summary
- Points of Contact
Unexploded Ordnance (UXO)

- 15 Million Acres/
  1,500 Sites in U.S.

- $100 – $400 Billion to
  Address U.S. Clearance
  Needs
Overview

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- Definitions
- DoD/Regulatory Roles
- UXO Technologies
- UXO Working Group
- Navy UXO Quality Assessment Program
- Summary
- Points of Contact
UXO Definitions

Before We Begin…

- UXO is a subset of OE as shown here:
UXO Definitions

## Range Definition Chart

<table>
<thead>
<tr>
<th>DoD Range Definition</th>
<th>Active/Inactive</th>
<th>CTT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governing Regulations</td>
<td>RCRA</td>
<td>CERCLA</td>
</tr>
<tr>
<td>Funding</td>
<td>O&amp;M</td>
<td>ER, N, BRAC...</td>
</tr>
<tr>
<td>Environmental Oversight</td>
<td>Compliance</td>
<td>Cleanup</td>
</tr>
</tbody>
</table>
Overview

- Background
- Definitions
- DoD/Regulatory Roles
  - Explosive Safety Oversight
  - Current Issues
- UXO Technologies
- UXO Working Group
- Navy UXO Quality Assessment Program
- Summary
- Points of Contact
DoD/Regulatory Roles

Explosive Safety Oversight

■ NOSSA
  ▪ Explosive Safety Submission: For transferring/leasing property
    • See NAVSEA OP 5 for requirements
  ▪ Should also submit work plans for intrusive work for investigations required for these properties to NOSSA
  ▪ Site Approval: For construction of facilities handling OE, go to NOSSA
    • See NAVSEA OP 5 and NAVFACINST 11010.44 for requirements
DoD/Regulatory Roles

Explosive Safety Oversight

- **DDESB**
  - DoD Directive 6055.9 states in Section 5.4.12 that the Secretaries of Military Departments shall: "Submit to the DDESB plans for the removal of unexploded ordnance or explosives when land known or suspected to contain such items is considered for the lease, transfer outside of the Department of Defense, or disposal."
DoD/Regulatory Roles

Site Approval/Review Process Screen 1

Site Identification

1. Ordnance Present?
   - yes
     - Property to be transferred, etc.?
       - yes
         - Prepare ESS (See Screen 3)
       - no
         - Follow IRP
   - no
     - See Screen 2

2. Prepare Intrusive Work Plans (Mods to ESS)

3. Complete Investigation/Remediation according to ESS

4. NOSSA/DDES review/approval

5. Prepare Closeout report

6. Submit to NOSSA/DDES for info

7. Prepare FOST/FOSL

See NAVSEA OP-5 for Guidance
DoD/Regulatory Roles

Site Approval/Review Process Screen 2:
Property to stay under control of Navy

1. Site Identification
2. Ordnance Present?
   - yes
     2.1 Property to be transferred, etc.?
       - yes
         2.1.1 See Screen 1
       - no
         2.1.2 Prepare Work Plans (See Screen 3)
       - Follow IRP
   - no
     2.2 Prepare Work Plans (See Screen 3)

   2.2.1 NOSSA/TECHDIV review

   2.2.2 Complete Investigation/Remediation according to Work Plans

   2.2.3 Prepare Closeout report

   2.2.4 Submit to NOSSA/DDESB for info
DoD/Regulatory Roles

Site Approval/Review Process Screen 3: Intrusive/OE Site Work

Investigation/Remediation Phases

Intrusive Work?

yes

Prepare Work Plans

Use UXO QA Procedures and Contract Specifications

Contractor Prepare SOPs

Submit to Explosive Safety Office for approval

Constructing OE Facility?

yes

Follow IRP

Define Requirements Future Land Use (Use DQO)

Define Methodology and Endpoints

Ensure Qualified Government Oversight

See NAVSEA OP-5

no

no

no

no

no

Execute Work

yes

Submit Site Plan to NOSSA For Approval

See NAVSEA OP 5 and NAVFACINST 11010.44
UXO Cleanup

Overview

- Background
- Definitions
- DoD Regulatory Policies
- UXO Technologies
  - Detection Methods
    - Description
    - Site Examples
  - Removal Technologies
    - Description
    - Site Examples
- UXO Working Group
- Navy UXO Quality Assessment Program
- Summary
- Points of Contact
UXO Projects

- Kaho'olawe Island, HI
- Mare Island Naval Shipyard, CA
- Pearl Harbor Channel, HI
- Naval Air Facility, Adak, AK
- Naval Air Station, New Orleans, LA
- Ikego Pond, Yukusuka, Japan
- Camp Hansen & Schwab, Okinawa
- Coral Sea Coral Pit, HI
Electromagnetic Detector

Kaho'olawe Island
Electromagnetic Detector

Kaho'olawe Island
Electromagnetic Detector

Kaho'olawe Island
Electromagnetic Detector

Kaho'olawe Island
Electromagnetic Detector

Kaho'olawe Island

Kaho’olawe Island Ordnance Display
Electromagnetic Detector

Kaho'olawe Island

Electromagnetic Detector for Rough Terrain
Electromagnetic Detector

Kaho'olawe Island

- Step 1: GPS Survey
- Step 2: Area Assessment
- Step 3: Area Preparation
- Step 4: Surface Clearance
Electromagnetic Detector

Kaho'olawe Island

Step 5: Subsurface Detection

Step 6: Excavation

Step 7: Access & Identification

Step 8: Disposal
Electromagnetic Detector

Kaho'olawe Island

Bip of a 500-Lb Bomb near the Base Camp
Validation of Detection Methods

Mare Island Naval Shipyard

- Investigations and Response Action for Sites Containing UXO
- 230 Acres Underwater
- 20 Acres Shoreside
Validation of Detection Methods

Mare Island Naval Shipyard
Validation of Detection Methods

Mare Island Naval Shipyard
Pearl Harbor Channel

Sewer Outfall Extension, Ft. Kamehameha, Pearl Harbor, HI

Towed Magnetometer
Towed Magnetometer

Pearl Harbor Channel

Towed Magnetometer
Towed Magnetometer

Pearl Harbor Channel

Six-Inch Shell
Towed Magnetometer

Pearl Harbor Channel

Shells removed from Channel
Evaluating Commercial Detection Equipment

NAF Adak
Evaluating Commercial Detection Equipment

NAF Adak
Evaluating Commercial Detection Equipment

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Evaluating Commercial Detection Equipment

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NAF Adak
Overview

- Background
- Definitions
- DoD Regulatory Policies
- UXO Technologies
  - Detection Methods
    - Description
    - Site Examples
  - Removal Technologies
    - Description
    - Site Examples
- UXO Working Group
- Navy UXO Quality Assessment Program
- Summary
- Points of Contact
UXO Removal

NAS New Orleans
UXO Removal

NAS New Orleans
UXO Removal

NAS New Orleans
UXO Removal

NAS New Orleans
UXO Removal

Coral Sea Coral Pit, HI
UXO Removal

Coral Sea Coral Pit, HI
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- **UXO Working Group**
- Navy UXO Quality Assessment Program
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- Points of Contact
UXO Working Group

- Established Spring 2000
- Quarterly Meetings
- Participants
  - All EFDs/EFAs
  - NAVFAC
  - CNO
  - NFESC
  - EODTECHDIV
  - CECOS
UXO Working Group

**Navy UXO Response Contract (NURC)**

- Investigate for UXO
- Identify UXO
- Remove/Detonate UXO
- Address Chemical Contamination

- $50M Capacity
- Cost Plus Award Fee
- 4 Option Years
- Awarded July 1999
- Worldwide
UXO Working Group Goals

- Develop NAVFAC-Wide UXO Guidance
- Produce a QA Guide
- Design and Implement UXO Training
- Standardize UXO Contract Language
- Promote the use of Innovative Technologies
- Enhance Navy’s Capabilities in UXO Field
UXO Working Group

- Detection and Threshold Levels
  - EODTECH DIV Presentation
  - Development Technologies
  - System Deployment
- Effects of Underwater UXO and BIPs
  - NFESC Lead
- Parametric Risk Assessments
  - EFA WEST
  - Mare Island Naval Shipyard
UXO Working Group

UXO Working Group

- Training
  - Modularize
  - Include Safety Awareness
  - Incorporate Existing Courses

- Standardizing Contracts
  - Guide Specification for Construction Contracts when UXO Suspected
  - Detailed Specifications for Detailed UXO Investigations and Cleanups
UXO Working Group

UXO Working Group

- Draft Quality Assurance Program Plan Issued
  - Awaiting Comments

- Site Approval and Property Transfer Review
  - Construction
UXO Working Group Web Page

- https://pacinfo.efdpac.nafac.navy.mil/uxo
  - Charter
  - Meeting Minutes
  - DoD References
  - Navy References
  - UXO Organization
UXO Cleanup

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- Overview of the QA Approach
- UXO Quality Systems Drivers
- Basis for the UXO QA System and its Relationship to CERCLA
- UXO QA Components and the Implementation Cycle
- Plans for the Future
Quality System Drivers

- Keep explosives safety first
- Capture quantifiable data to:
  - Qualify plans & processes for execution
  - Measure cleanup contractor performance & contract specification compliance
  - Support post clearance certification for use
  - Minimize risk & liability after site turnover
  - Support public/stakeholder confidence by providing measurable evidence of cleanup
  - Identify lessons learned
- Data: Repeatable, reusable and verifiable
UXO QA system development is occurring in an evolutionary environment.

- QA system currently addresses:
  - PA & RI: first two phases of CERCLA
  - Portions of later CERCLA Phases

- Validation testing: ongoing

- Anticipate addressing all facets of UXO clearance, structured to parallel CERCLA
Navy UXO Quality Assessment Program

Program Relationship to CERCLA

- Preliminary Assessment (PA)
- Remedial Investigation (RI)
- Feasibility Study (FS)
- Remedy Selection
- Record of Decision (ROD)
- Remedy Design
- Remedial Action
- Closeout incl. O&M

Quality Assessment Process

- DQOs Specify DQEs with Associated Measures
- DQEs Relate to Question Sets (QS)
- WI are Compiled to Check & Verify Measures

Data Quality Objectives (DQO)
- Data Quality Elements (DQE)
- Question Sets (QS)
- Work Instruction (WI)

*Comprehensive Environmental Response, Compensation, and Liability Act
Navy UXO Quality Assessment Program

Aspects of Program

- Based on recognized standards and regulations
  - CERCLA
  - ISO 9000
  - Mil-Std-1916
  - Others
- Modular, logical, easily understood and measurable
- Can be tailored/modified/customized for situational conditions
- Provides methods for the capture and collection of quantifiable objective evidence
- Traceable, verifiable and accountable
- Require a specific skill mix
Navy UXO Quality Assessment Program

Basic Quality Measurement Cycle

PLANNING
- Establish Evaluation Criteria
- Identify Data Collection Methods and Metrics

EXECUTION
- Conduct Assessment Collection & Record Data
- Analyze Findings
- Report Findings

FOLLOW-UP
- Monitor and Validate Corrective Action
Navy UXO Quality Assessment Program

Planning: Program Supports UXO Cleanup Activities

What is the Land Reuse Objective?
What are the UXO Cleanup Goals?
Are the Objectives and Goals Compatible?

What are the Requirements?
How is Compliance Measured?

Requirements

Contractor Site-Specific Quality Assurance Plan

Contract & Statement of Work

Data Quality Objectives (DQO)

Navy Quality Assessment Plan & Program

Work Plan
Navy UXO Quality Assessment Program

**Execution: Team & Responsibilities**

- **NAVY Quality Assessment**: Planned systematic independent activities executed to provide confidence of compliance to stated objectives and requirements

- **Quality Assurance**: All the planned and systematic activities implemented within the quality system needed to provide adequate confidence that an entity will fulfill its requirements for quality

- **Quality Control**: The operational techniques and activities used to fulfill requirements for quality
Navy UXO Quality Assessment Program

Business Rules

Contract Project Setup
- Identify Project & Contract DQOs
- Select Associated DQE
- Create Project QAPP
- Train Quality Assessor
- Tailor AQAPS

Contract Data Collection
- Compile Work Instruction
- Conduct/Record Hazard Analysis
- Execute Work Instruction
- Enter Results Into AQAPS
- Validate AQAPS Data
- Compile Assessment Data in QAR

Contract Data Correction & Analysis
- Corrective Action Process
- Sampling Data Collection & Analysis
- Trend Analysis
- Root Cause Analysis

Quality Assessment Program Management
- QAP Continuous Improvement Process
- QAP Training

AQAPS: Automated Quality Assessment Program System
DQO: Data Quality Objectives
DQE: Data Quality Elements
QAPP: Quality Assessment Project Plan
QAP: Quality Assessment Program
QAR: Quality Assessment Record

Automated Business Rule
Manual Business Rule
Navy UXO Quality Assessment Program

Tomorrow Overview

- Fully develop UXO QA elements for all facets of UXO activities
- Expand to include all phases of CERCLA including Closeout
- Integrate into UXO Remediation contracting process
- Enable NAVFAC/Navy to rollout
  - Automated UXO Quality Assessment Process
  - RPM & ROICC Training
  - Contractor Guide
  - Implementation on Navy UXO contracts
- Make available to contractors for their use
Purpose:
- To provide a baseline of information to construction project managers, environmental/remedial project managers, construction inspectors, and others required to manage ordnance projects at active and closing naval facilities.

Intent:
- To provide standard contract language, references, resources, and assistance for developing scopes of work and cost estimates, for reviewing ordnance work documents and overseeing ordnance fieldwork.
OE Desk Guide (cont.)

Ordnance Skills Hierarchy

- Outlines the required skill hierarchy appropriate to those individuals performing UXO remediation
  - UXO Sweep Personnel
  - UXO Technician I
  - UXO Technician II
  - UXO Technician III
  - Senior UXO Supervisor
  - UXO Quality Control Specialist
  - UXO Safety Officer
Regulatory Requirements

- CERCLA
- NCP
- NAVSEA OP 5 (Ammunition and Explosives Ashore Safety Regulations For Handling)
- DDESB 6055.9, Chapter 12 (Removal Depth for Real Property Contaminated with Ammunition, Explosives, or Chemical Agents)
UXO Cleanup

CECOS Training

- Definition and description of UXO/OE
- Safety and environmental hazards associated with UXO/OE
- Regulations
- Integration of UXO/OE cleanup and environmental cleanup
- Site characterization
- Risk assessment
- Response selection
- UXO technologies
  and
- Site closeout
UXO Cleanup

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UXO Cleanup

Summary

- Become familiar with the Regulatory Roles
- Keep current on technology and techniques
- If you have questions, contact your UXO POC
- Visit the UXO Workgroup Web Pages
- Make all pertinent decisions **WITH** your stakeholders
- Plan on good Government QA
- Don't reinvent the wheel!
  - Use standard contract language, QA, etc.
UXO Cleanup

References

- 10 USC 172, Ammunition Storage Board
- NAVSEA OP 5
- NAVFACINST 11010.44
- DoD Directive 6055.9, DoD Explosives Safety Board (DDESB) and DoD Component Explosive Safety Board Responsibilities, July 19, 1996
- DoD Explosives Safety Board, Decision Memorandum, Subj: 315th Board Meeting, January 21, 1998
- DoDI 6055.14, Unexploded Ordnance (MILITARY MUNITIONS, INCLUDING UXO) Safety on Ranges, January 23, 1998
DoD 6055.9-STD, DoD Ammunition and Explosives Safety, August 11, 1997 establishes uniform safety requirements applicable to ammunition and explosives and to associated and unrelated personnel and property exposed to the potential damaging effects of an accident involving ammunition and explosives during their development, manufacturing, testing, transportation, handling, storage, utilization, maintenance, demilitarization, and disposal.
References (cont.)

- OPNAVINST 8020.14
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. section 9601 et seq.)
- ISO 9000
- Mil-Std-1916
UXO Cleanup

References (cont.)

- Office of the Undersecretary of Defense Memorandum, Interim Policy on Land Use Controls Associated with Environmental Restoration Activities, August 31, 2000

- Department of the Navy Chief of Naval Operations Memorandum, Department of the Navy Environmental Policy Memorandum 99-02; Land Use Controls, May 25, 1999

- Draft Underwater OE/UXO Policy Document, dated 1 Nov 00 (Update when published)

- UXO Skills Hierarchy
Overview

- Background
- DoD Regulatory Policies
- UXO Technologies
- UXO Working Group
- Summary
- Points of Contact