



Department of Energy

Washington, DC 20585

January 24, 2011

MEMORANDUM FOR DISTRIBUTION

FROM:

DAE Y. CHUNG
PRINCIPAL DEPUTY ASSISTANT SECRETARY
FOR ENVIRONMENTAL MANAGEMENT

SUBJECT:

Office of Environmental Management Quality Assurance
Summit Invitation to Discuss Major Construction Project
Lessons Learned

The Office of Environmental Management (EM) is responsible for a wide range of critical activities including managing the design, construction, operation, and eventual disposition of mission-critical projects/facilities. One of the Department of Energy's management principles is that we will succeed only through teamwork and continuous improvement. EM has also adopted a core value that we ask for help when we need it and we look for ways to help each other succeed. This memorandum is intended to do just that, ask for your help. You are receiving this invitation because you have been identified as an individual with extensive knowledge of our EM construction project successes and struggles. We are intentionally keeping the invitation list limited to facilitate frank and open discussions and sincerely appreciate your time and commitment to this effort.

As you know, EM has multiple major construction projects that range in status from design to commissioning. Over the past several months, we have experienced a number of quality related issues at the various construction projects and feel that we can all learn from these experiences. Working with the Deputy Secretary of Energy, EM has committed to an overarching strategy to improve project and contract management for our major construction projects. One of the commitments in this discussion was the use of a Quality Assurance (QA) Summit to solicit feedback and information from our contractors and project personnel. As such, EM is sponsoring a QA Summit for a select set of individuals involved in our construction projects. This summit will be held February 17, 2011, in Oak Ridge, TN at Building 2714 just across from the Federal Building. The summit will be used to discuss key quality issues that have been encountered by our construction projects and capture thoughts and approaches to ensure these issues are not experienced at other construction projects. A draft agenda for the summit is attached and the proposed general topics that will be discussed are:

- Lack of sufficient Quality Control inspectors on EM construction projects;
- General supplier/vendor quality issues;



- Welding issues specific to large American Society Mechanical Engineers vessels and waste pipe.

Office of Safety and Security Program will organize a conference call with the construction projects, who will be presenting at the Summit, to finalize the agenda, establish presenters, and discuss a template for the presentations. The information gathered from this summit will be collected and shared with the complex as part of lessons learned, white papers, deliverables from focus groups (via the EM QA Corporate Board), etc. The sharing of information is vital to our success as a Team. Therefore, we are asking each of you for your participation to help in completing our EM mission safely and correctly. Remember that achieving excellence is a continuous journey rather than a final destination.

This summit is intended as invitation only attendance, so please RSVP to Robert Murray, Director, Office of Standards and Quality Assurance at Robert.Murray@em.doe.gov or (202) 586-7267. If you are unable to attend, but would like a representative at the meeting, please coordinate with Mr. Murray for the substitution.

If you have any further questions, please contact Kenneth G. Picha, Jr., Acting Deputy Assistant Secretary for Safety and Security Program at (202) 586-5151.

Attachment

cc: I. Triay, EM-1
C. Anderson, EM-3

Agenda for Quality Assurance Summit		
<i>Location: Oak Ridge, TN – Building 2714</i>		
<i>Date: February 17, 2010</i>		
8:00 – 8:30 am	Introduction/Purpose for the QA Summit and General Format and Logistics Discussions	<i>Presenters: Dae Chung (EM-2) Bob Milazzo(EFCOG)</i>
8:30 – 9:00 am	<u>Presentation</u> Supply Chain and Oversight	Naval Reactors Technical Representative
9:00 – 9:10 am	<u>Questions/Discussion</u> Supply Chain and Oversight	Naval Reactors Technical Representative
9:10 – 9:20 am	Break	ALL
9:20 – 10:05 am	<u>Presentation</u> General Supplier/Vendor Quality Issues Regarding Commercial Grade Dedication	WTP Project <i>Presenter: Linda Weir</i>
10:05 – 10:35 am	<u>Group Discussion</u> General Supplier/Vendor Quality Issues Regarding Commercial Grade Dedication	ALL
10:35 – 10:45 am	Break	ALL
10:45 – 11:30 am	<u>Presentation</u> General Quality Issues in Commissioning and Startup	DUF6 Project <i>Presenter: Jack Zimmerman</i>
11:30 – 12:00 pm	<u>Group Discussion</u> General Quality Issues in Commissioning and Startup	ALL
12:00 am – 1:00 pm	Lunch	ALL
1:00 – 1:45 pm	<u>Presentation</u> Lack of Sufficient QC Inspectors on EM Construction Projects	SBW Project <i>Presenters: Robert Thompson, Greg Hayward</i>
1:45 – 2:15 pm	<u>Group Discussion</u> Lack of Sufficient QC Inspectors on EM Construction Projects	ALL
2:15 – 2:25 pm	Break	ALL
2:25 – 3:10 pm	<u>Presentation</u> Welding Issues Specific to Large ASME Vessels and Waste Pipe	SWPF Project <i>Presenter: Dave Tuttel</i>
3:10 – 3:40 pm	<u>Group Discussion</u> Welding Issues Specific to Large ASME Vessels and Waste Pipe	ALL
3:40 – 3:50 pm	Break	ALL

Agenda for Quality Assurance Summit

Location: Oak Ridge, TN – Building 2714

Date: February 17, 2010

3:50 – 4:35 pm	<u>Presentation</u> UPF Supply Side Lessons Learned - Strategies/Counter Measures	HEUMF Project <i>Presenter:</i> <i>Dominic Canazaro</i>
4:35 – 5:05 pm	<u>Group Discussion</u> UPF Supply Side Lessons Learned - Strategies/Counter Measures	ALL
5:05 pm	Dismiss	ALL



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Quality Assurance Summit

Office of Environmental Management
U.S. Department of Energy

Oak Ridge, TN

February 17, 2011



EM Environmental Management

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Announcements

- Safety/Evacuation Information
- Logistics for badge requirements for Building 2714
- Refreshments and Restrooms
- Sign-in Sheet
- Presentations and meeting minutes will be available online at the following website:

<http://www.em.doe.gov/Pages/QACorporateBoard.aspx>



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Format

- Opening Remarks/Introductions
- Presentations on current quality issues around the complex and a planned approach toward resolution
- Project Presentations on Key Quality Issues, their Impact(s), and actions that have been taken to resolve/prevent recurrence.
- Open Group Discussion
 - Lessons Learned
 - Successes of Approach
 - Shortcomings of Approach
 - Suggested Improvements



Open Discussion Ground Rules

- Each presentation will be followed by invited remarks from the Panel, Federal Project Directors and Project Personnel, and the audience
- Use the microphone to speak (sidebars will not be recognized)
- When speaking, identify yourself by name, company affiliation, and project affiliation
- Please refrain from using company or individual names in examples
- Comments/Questions need to be succinct and no longer than 1 minute in duration to allow others to participate
- Meeting minutes and lessons learned will be documented and made available online at:

<http://www.em.doe.gov/Pages/QACorporateBoard.aspx>



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Agenda

- Introduction/Opening Remarks (*EM & EFCOG Management*)
- Supply Chain and Oversight (*Naval Reactors*)
- Supplier Quality Issues Regarding Commercial Grade Dedication (*Waste Treatment and Immobilization Plant*)
- General Quality issues in Commissioning and Startup (*DUF6 Plant*)
- Lack of Sufficient QC Inspectors on EM Construction Projects (*Sodium Bearing Waste Plant*)
- Welding Issues Specific to Large ASME Vessels and Waste Pipe (*Salt Waste Processing Facility*)
- Supply Site Lessons Learned – Strategies/Counter Measures (*Uranium Processing Facility – NNSA*)





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Quality Assurance Summit

Introduction/Opening Remarks

Dae Chung
Principal Deputy Assistant Secretary
Office of Environmental Management

February 17, 2011



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EM's Recent Corporate Accomplishments to Improve Quality

- Development and implementation of a consistent corporate QA Program
- Implementation of standard contract language associated with QA
- Resolution of issues specific to:
 - Flow down of quality requirements
 - Application of the graded approach to implementing quality requirements
 - Detection of S/CI components for electronics
 - Acquisition of QA/QA resources for EM construction projects
 - Development and presentation of training courses for Commercial Grade Dedication
 - Enhanced Operational Awareness including development and deployment of a web-based corrective actions Hub
- Current Focus Areas under investigation by EM Corporate QA Board
 - Grading QA for D&D
 - QA during Design
 - Commercial Grade Dedication Guidance
 - Joint Supplier Evaluation Program



EM's Partnership with the Nuclear Community

- Sponsored DOE Vendor Outreach Events
 - Denver, CO – July 2008
 - Augusta, GA – March 2009
- Engaged participation and sponsorship of NEI Outreach Events
 - Detroit, MI – June 2009
 - Orlando, FL – October 2009
 - Irvine, CA – March 2010
 - Chicago, IL – June 2010
 - Charlotte, NC – September 2010
- Provided multiple sessions for requirements and specialized training to sub-contractors
 - NQA-1 Requirements
 - QA Requirements for performing work with EM
 - Commercial Grade Dedication



Construction Quality Issues

- HF Piping
- Large ASME Vessel Fabrication
- HPAV - Hydrogen in Process Piping
- Structural Steel Dedication
- Process and Waste Piping
- Rebar Placement
- Concrete Placement
- Suspect and Counterfeit Items with respect to electronics



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QA Summit

- Thank you for attending
- The QA Summit is a group discussion, not strictly a presentation based forum
- The success of the Summit will depend on your participation
- Goal of the Summit is to exchange information and Lessons Learned
- We will succeed only through teamwork and continuous improvement



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Quality Assurance Summit

Opening Remarks - EFCOG

EFCOG ISM/QA Working Group

Robert Milazzo

February 17, 2011



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EFCOG Objective and Support of DOE's Journey to Excellence

- EFCOG – Energy Facilities Contractors Group
- Formed in 1991 by a group of DOE contractors wanting to share lessons learned and best practices across corporate lines to improve the cost effectiveness of DOE Operations.
- Volunteer organization
- Supported by DOE



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EFCOG Primary Objectives

- Identify and implement rational, cost-effective solutions to evolving DOE issues.
- Communicate with DOE to determine its specific needs, support DOE strategic planning as requested, and offer innovative solutions to problems.
- One Key specific area of support involves the Journey to Excellence Mission Goal - #5 Improve safety and quality performance towards a goal of zero accidents.



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EFCOG Working Group Efforts

- Thirteen active Working Groups providing direct support of DOE EM's Journey to Excellence
- Based on EM concerns expressed on QA in late 2006, EFCOG participated in the early EM QA assessments (Assist visits) on key projects in 2007.
 - The EM Corporate QA Board developed the top QA concerns for the complex and teams were formed to specifically address each focus area (providing recommendations to the Board).
 - Each team has two team leads – one EFCOG and one DOE.
- Issues addressed by the EM Corporate QA Board include:
 - Initial Five QA Issues (2008 to 10)
 - Requirements Flow Down to Contractors and Subcontractors;
 - Adequate NQA-1 Suppliers/Vendors;
 - Commercial Grade Dedication (CGD) Implementation;
 - Graded Approach to Quality – Implementation;
 - Federal Understanding of Quality Assurance (QA) and Oversight;
 - Current QA Issues (2011)
 - Joint Supplier Evaluation Program
 - Commercial Grade Dedication (CGD) Implementation
 - Design Quality Assurance
 - Grading QA for Decontamination and Decommissioning Activities



EFCOG Working Group Efforts con't.

- EFCOG- continues to support the EM Corporate QA Board on QA improvement issues with key participants from the EFCOG ISM &QA and the Engineering Working Groups (e.g., Commercial Grade Dedication)
- This Summit fits well with these efforts in providing lessons learned on specific QA issues experienced on our EM projects.



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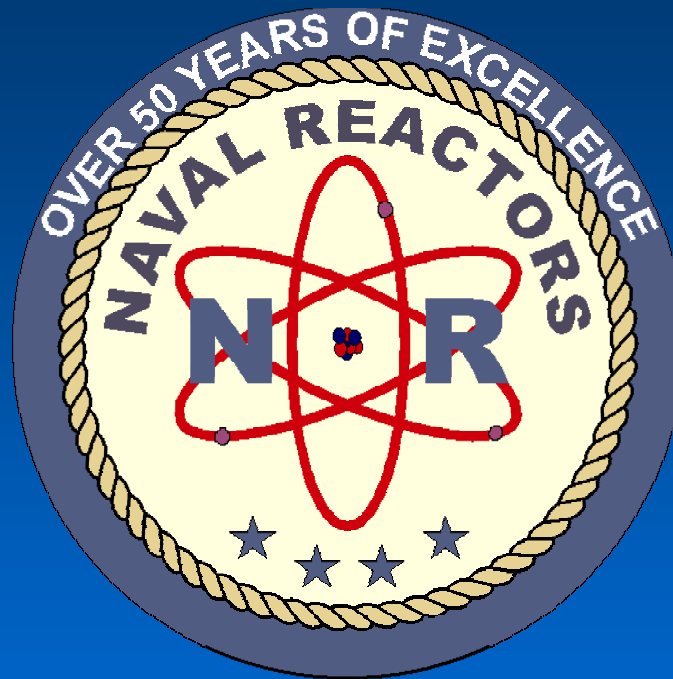
EFCOG Support/Commitment to this Objective/Meeting

- EFCOG has been integral in the development and coordination of the Summit
- EFCOG recognizes the recent QA problems that have been encountered and the need to ensure these issues do not continue
- EFCOG commitment to support EM's mission and promise to the American people to reclaim our lands from the nuclear legacy from the Cold War.
- EFCOG will utilize the results of this meeting/discussions to help EM's current and future construction projects



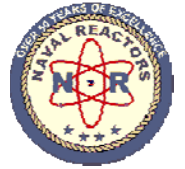
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NAVAL REACTORS SUPPLY CHAIN AND OVERSIGHT





Naval Reactors Supplier Oversight



- ❖ **Right People Looking at the Right Thing, at the Right Time**
- ❖ **Integrated**
- ❖ **Dynamic**
- ❖ **Data Driven**
- ❖ **Trained Surveillance Techniques**
- ❖ **Supplier Ownership of Quality**
- ❖ **Specification Based**
- ❖ **Independent Confirmation of Condition**



Naval Reactors Supplier Oversight

- ❖ **Right People Looking at the Right Things at the Right Time.**
 - **Have the person with the best-suited knowledge base and skills perform oversight of a specific item.**
 - Cognizant equipment engineer
 - Process expert
 - Quality Assurance Engineer
 - Government Quality Assurance Resident
 - **Verification is performed most often in process than in final buy off**
 - **It isn't one person's or one functional group's job. It takes a coordinated, integrated approach from all organizations**



NR Oversight Strategy –PLANNING

❖ Integrated/Coordinated Supplier Oversight Planning

- **Focused Oversight Roles and Responsibilities**
 - **Prime Contractor: Specification compliance / product and process quality**
 - **DCMA: Procedure compliance/process oversight/product compliance**
- **Focus on unique special aspects, critical feature, complexities, etc. of product and processes while providing comprehensive system coverage**
- **Formal Documented Quality Oversight Planning Process**
 - **Prime Contractor Quality Surveillance Plans (QSPs)**
 - **DCMA Facility Surveillance & Inspection Plans (FSIPs)**
- **Applicable to Naval Nuclear Propulsion Program Principal Suppliers (40)**

THE RIGHT OVERSIGHT BY THE RIGHT PEOPLE AT THE RIGHT TIME



NR Supplier Oversight – Surveillance Planning



❖ Dynamic

- **Prime Contractor Developed - Quality Surveillance Plans (QSPs)**
 - **Comprehensive supplier-specific NNPP Prime Contractor oversight plan**
 - **Prepared every six months and updated as needed**
 - **Based on real-time production and contract status**
 - **Linked to and coordinated with DCMA surveillance plans**
 - **Oversight plans and results documented in the NRWAN (NNPP-WEB) based Vendor Oversight System (VOS)**
 - **Governed by QSP-1 – “Prime Contractor Oversight Guidance Document” Revision 3, dated June 5, 2003**



NR Supplier Oversight – Performance Monitoring



❖ Data Driven – Supplier Performance Scorecard

- **Effective supplier quality systems and delivery schedule performance are key factors in ensuring overall quality and timeliness of components delivered to the Program**
- **The Supplier performance scorecard provides an assessment of a number of quality performance attributes.**
- **Developed and agreed upon semi-annually by QA and the engineering communities concurrent with the QSP process.**
- **Poor ratings or declining trends in a given area are afforded special attention in the QSP with the goal of improved performance.**
- **Metrics are shared and discussed with Supplier Senior management as part of Quality Expectations Meetings.**



NR Supplier Oversight – Performance Monitoring



Element	Supporting Elements	Comments
Product Quality	Inspection/Test Capability	
	Inspection Planning	
	Internal Defect Rate	
	Rework Rate	
	Delivered Equipment Quality	
Management Responsibility	Quality Focus	
	Senior Management Involvement	
	Customer Focus	
	Continuous Improvement	
	Infrastructure/Resources	
Subvendor Management	Subvendor Selection	
	Subvendor Purchase Orders	
	Subvendor Monitoring/Surveillance	
Corrective Action	Subvendor Compliance/Quality	
	Nonconforming Material Control	
	Corrective Action (C/A) System	
	Root Cause Analysis	
	C/A System Effectiveness	
Self Assessment / Continuous Improvement	Data Analysis	
	Internal Audits	
	Preventive Action	
	Management Review / Support	
Process Control	Process Procedure Adequacy	
	Compliance	
	Repeatability	
	Training and Qualification	
	Process Performance	
Configuration Control	Product Configuration	
	Document Control	
	Change Management	
	Data Book Adequacy	
	Record Control	
Engineering	Technical Capability	
	Design Doc. / Technical Submittals	
	Contract Review	
	DSR/RAR/REC	
	Knowledge Management	
Delivery Performance	Hardware Delivery	
	Software Delivery	
	Ability to Meet Needs	
	Project Planning & Management	



NR Oversight Implementation - Training



❖ Trained Surveillance Techniques

- **Engineers who will be performing or contributing to surveillance need proper training and preparation to do an effective job.**
- **Dedicated surveillance training workshops developed to facilitate the learning process.**
- **Workshops are given on a recurring basis several times a year for all Program personnel performing surveillance.**
- **Surveillance is expected to be performed on every trip to a supplier. The depth of surveillance will vary with the purpose of the trip.**
- **Surveillance is targeted for a specific purpose even if not contained in the QSP**



NR Supplier Oversight – Teaming



❖ **Supplier Ownership of Quality – Expectations Meetings**

- **Periodic meeting with supplier and Prime Contractor Senior level management**
- **Two-way communication mechanism to understand a supplier's self-assessment and their Prime Contractor's expectations particularly as it relates to Quality**
- **Work together to develop a plan to close the gap between supplier performance and Prime Contractor expectations**
- **Governing document is EXP-1, "Prime Contractor Expectations Meeting Guidance Document" Revision 1, dated June 5, 2003**



NR Supplier Oversight – Planning Tools



❖ Specification Based

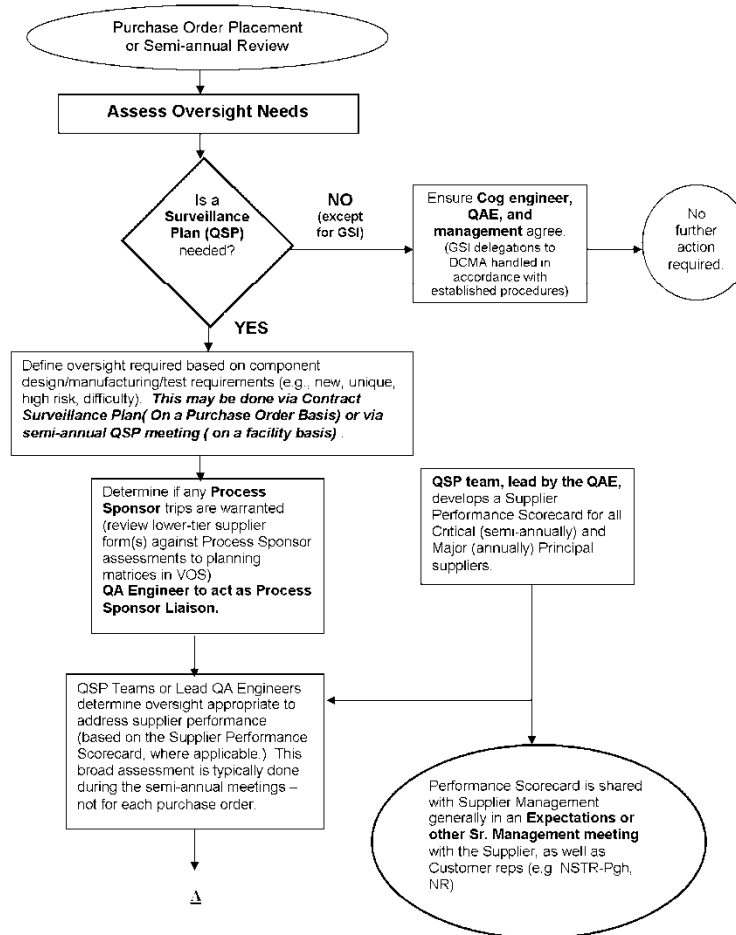
- **Governing Requirements developed to provide structure to the strategy**
 - QSP-1
 - PSP-21
 - EXP-1
 - NSTR-2000
- **Web-based tools developed to document surveillance plans and results**
 - Vendor Oversight System (VOS)
 - Supplier Performance Scorecards
- **Overall Supplier Oversight Program Requires Efforts of Approximately 200 Individuals**

Naval Reactors Supplier Oversight

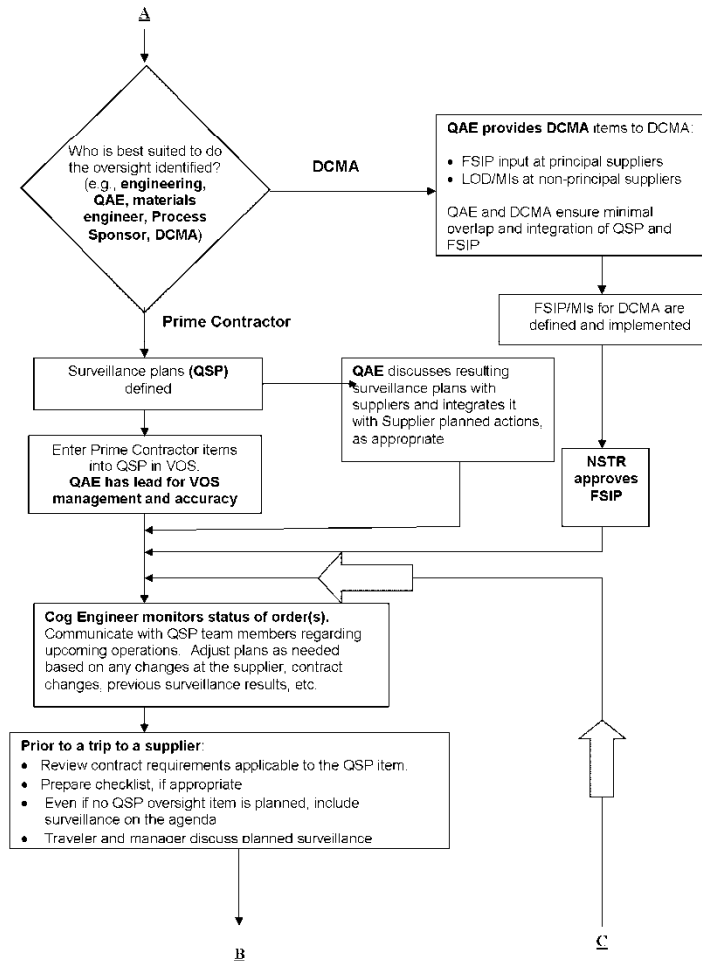


NR PROGRAM OVERSIGHT PLANNING AND EXECUTION PROCESS FLOW

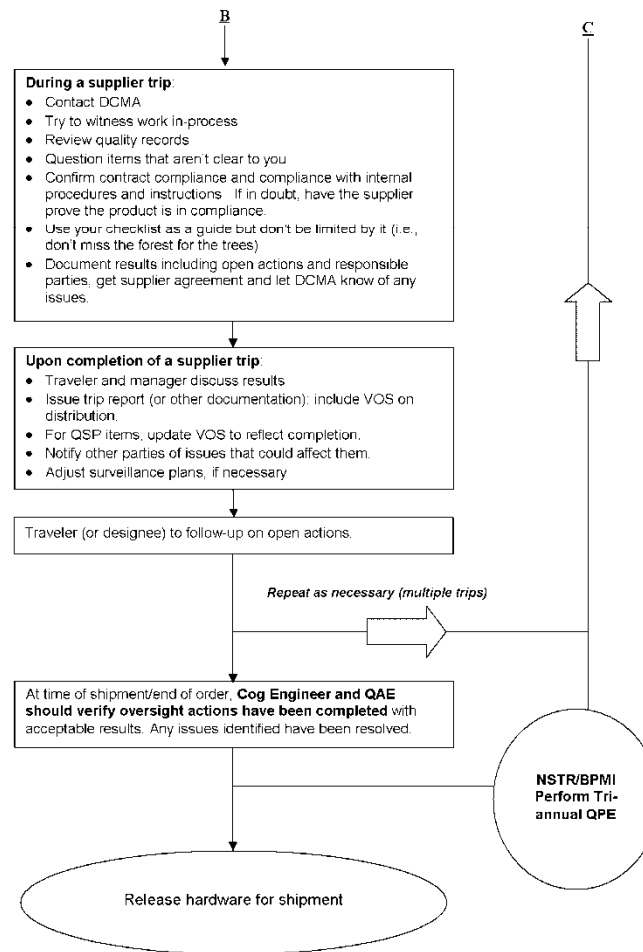
(Rev 1 June 2007)



Naval Reactors Supplier Oversight

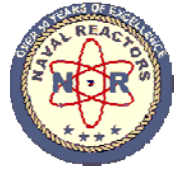


Naval Reactors Supplier Oversight





Naval Reactors Supplier Oversight



❖ Independent Confirmation of Condition

- Tri-Annual Complete Evaluation of Supplier Quality Performance (QPE)
- Cross Functional Team
- Team Lead by Naval Reactors Personnel
- Problems Identified by the QPEs are Tracked Back to Integrated Oversight Program



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Quality Assurance Summit

Supplier Quality Issues Regarding Commercial Grade Dedication

Waste Treatment Plant Project

Linda Weir
Manager of Quality and Performance Assurance
Bechtel National, Inc.

February 17, 2011



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Outline



- WTP Project Status
- Overview of the Vendor Commercial Grade Dedication Issue
- Discussion of the Project's Resolution of the Issue
- Effectiveness of Actions Taken
- Open Group Discussion of Lessons Learned, Successes of Approach, Shortcomings of Approach, and Any Actions Needed
- Summary of Group Discussion



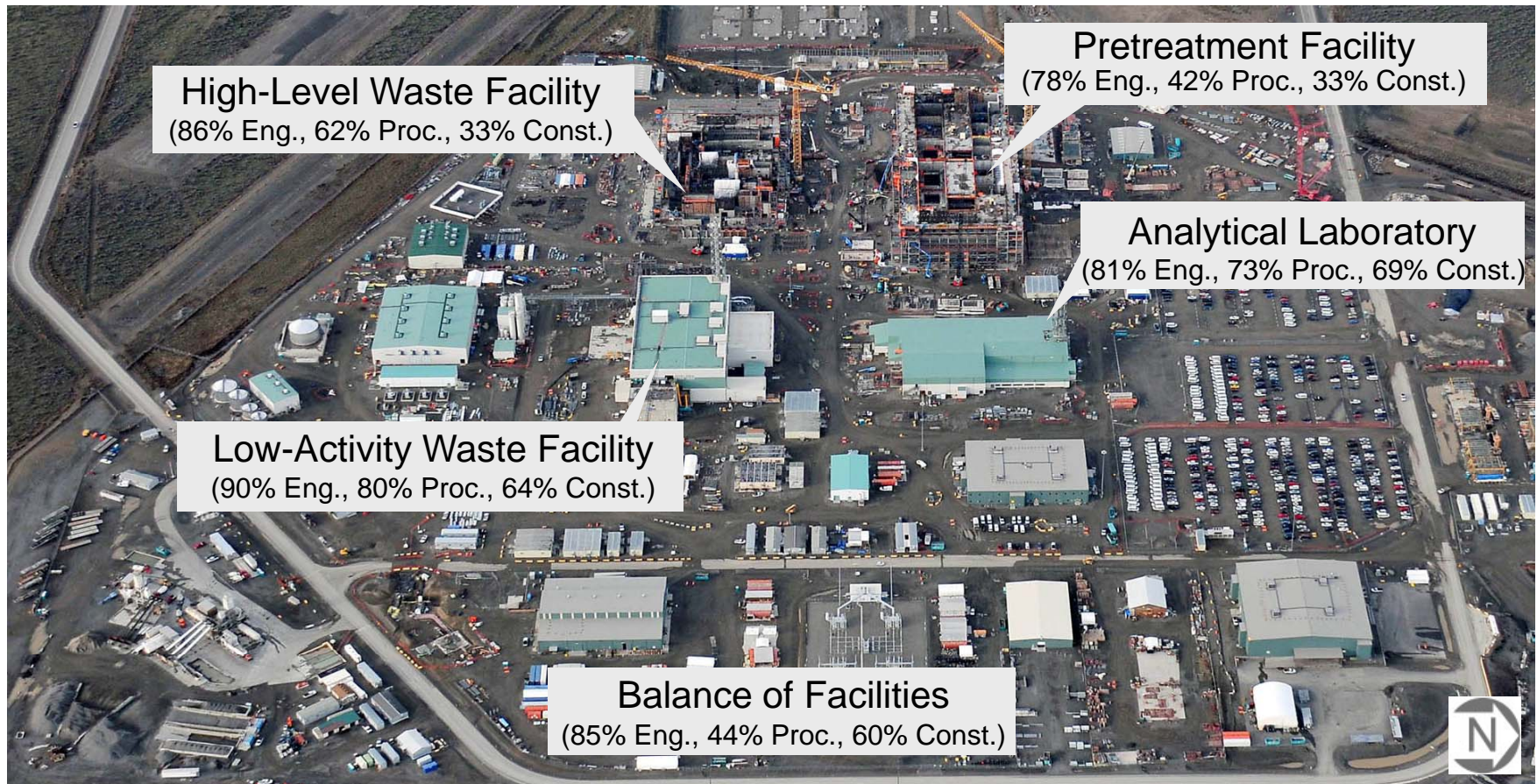
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WTP Project Status



* Excludes MR and DOE Contingency

Total Project 57% Complete *
(81% Eng., 55% Proc., 53% Const.)

Data as of December 2010



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Vendor Commercial Grade Dedication Issue

In May – June, 2009, DOE Office of River Protection WTP Construction Oversight's reviews of WTP vendor oversight activities identified issues regarding suppliers' use of commercial grade dedication (CGD) to upgrade commercially procured materials for use in safety significant applications. Issues of concern included:

- Lack of engineering evaluations to support selected critical characteristics in relation to design requirements (safety function)
- Lack of acceptance criteria for sampling criteria used for inspections
- Disorganized history packages with unclear basis for use as the sole method of supplier qualification
- Lack of documented basis for the use of Positive Material Identification (PMI) for acceptance of materials
- Limited information in WTP-approved CGD plans regarding the item's safety function
- Failure of suppliers to perform a site survey of sub-tier suppliers as a basis for acceptance of material certification

Immediate Actions

Immediate actions included:

- Suspending shipments from all Q Material Suppliers pending completion of extent of condition reviews
- Mobilizing an independent review task team to complete a root cause analysis, oversee action plans and results, and review effectiveness of implemented corrective actions
- Initiating evaluation of extent of condition via a Vendor Commercial Grade Dedication (VCGD) Program Review



Root Cause Analysis

The Root Cause Analysis identified:

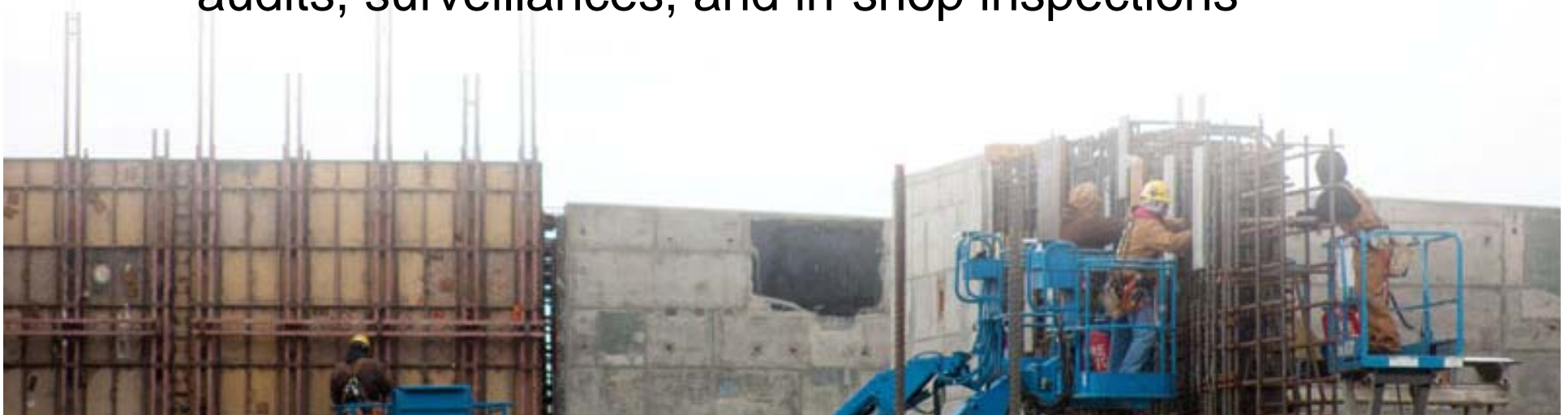
- 2 Root Causes
- 4 Contributing Causes
- 15 Judgments of Need



Root Cause Analysis

Root Causes

- Failure to confirm that rigorous CGD expectations and requirements were clearly understood by suppliers and sub-suppliers (to include subcontractors)
- Failure to execute rigorous supplier and sub-supplier qualification requirements (e.g., CGD) at the time of initial qualification survey and subsequent performance-based audits, surveillances, and in-shop inspections



Root Cause Analysis

Contributing Causes

- Over reliance on Q suppliers' knowledge of CGD and flow down of CGD requirements to their suppliers
- Inadequate monitoring and acting on supplier and sub-supplier CGD issues through trending and analysis, lessons learned, and performance indicator processes
- Ineffective roles, responsibilities, accountabilities, and authorities, interfaces, and training for effective CGD program implementation
- Inadequate use of CGD subject matter experts in the review, approval, and oversight of CGD program activities



Vendor Program Reviews

WTP had contracted with a total of 87 suppliers under a Q contract as of July 3, 2009:

- 56 were actively supplying Q material
- 31 vendors had been under contract to supply Q material but were currently inactive or no longer under contract

Prioritizing VCGD Program Reviews and addressing issues were driven by the materials and equipment needed to support the near-term construction schedule



Vendor Program Reviews

VCGD Program Reviews were conducted by:

- Assigning overall responsibility to a dedicated project manager
- Establishing full-time VCGD Program Review review/assist teams, composed of a procurement engineering representative, a design engineering representative, and a quality assurance representative
- Establishing a Vendor Review Board to review findings, recommendations, and observations of the review teams
- Pre-review of vendor QA manuals and CGD plans, On-site implementation review used VCGD-specific checklist and detailed lines of inquiry
- Identifying remedial actions based on site visit
- Issuing Supplier Corrective Action Reports (SCARs) to address vendor quality program issues
- Issuing NCRs to address issues with previously delivered material/equipment



Vendor Program Reviews

Results of the Vendor Program Reviews

Active vendors

- No issues with 25 of the 56 vendors
- 58 concerns within 31 of the 56 active vendors

Inactive vendors

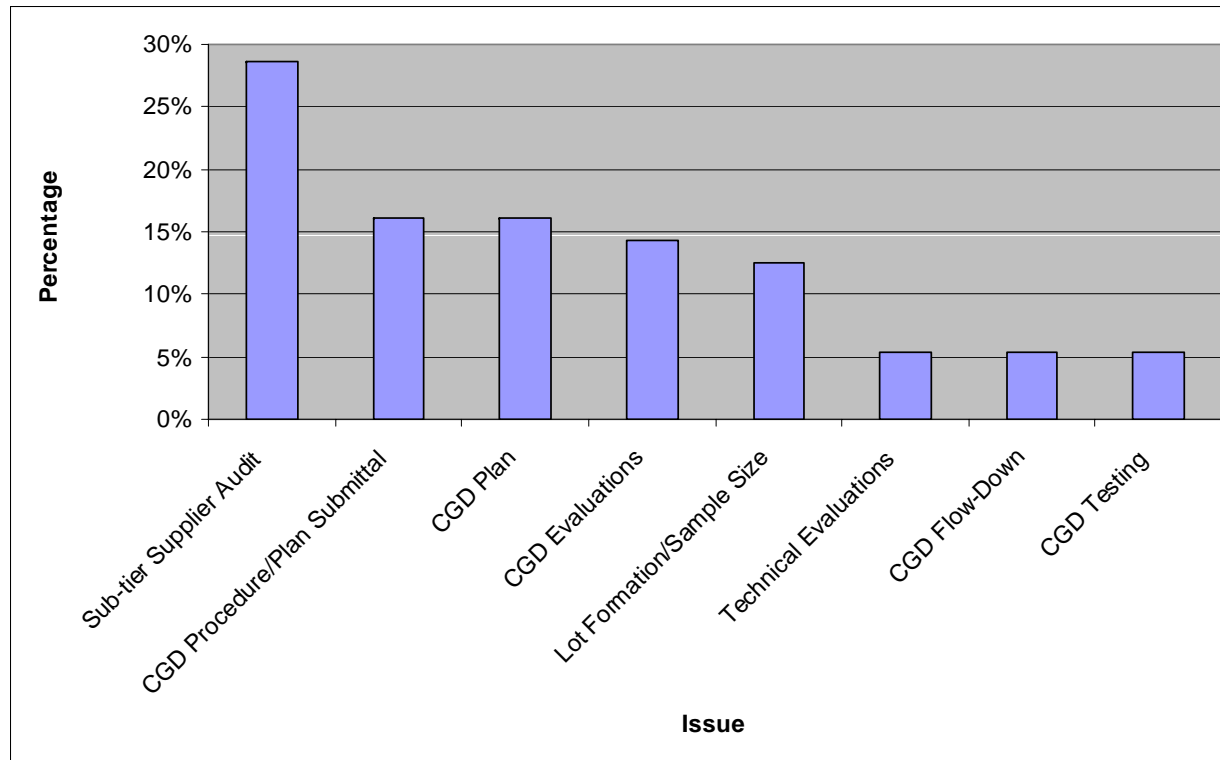
- No concerns with material provided by 25 of the 31 inactive vendors
- Concerns with material provided by 6 of the 31 inactive vendors

Program reviews of inactive vendors evaluated the acceptability of delivered material and were not reviews of the vendors' CGD programs



Vendor EOC Reviews

Percent of all Active Vendors with Issues within a Specific Area of Concern



VCGD Program Reviews confirmed the findings of the Root Cause Analysis



Other Actions

Other actions taken by the project included:

Vendor Help

Issued a Vendor “how to” CGD Guide and conducted workshops and assist visits for suppliers

Incorporated WTP CGD SMEs into the review process for vendor CGD procedures and plans

Organization Changes

Established the Vendor Review Board to review findings, recommendations, and observations of the VCGD Program reviews

Established a Nuclear Materials and Services functional area and associated R2A2s to provide single point accountability for CGD programs, procedures, and execution



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Other Actions

Other actions (continued):

WTP Training &
Process
Improvements

Provided a workshop on NQA-1 concepts to augment supplier auditing personnel skill set

Revised procedures and checklists to facilitate in-depth supplier/ subcontractor performance-based assessments

Recommendation
Actions

Developed plans and processes to reinvigorate and strengthen WTP Nuclear Safety Quality Culture



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Vendor Commercial Grade Dedication Success

- ▶ WTP has one Commercial Grade Dedication process owner
- ▶ Ownership is well defined
- ▶ Personnel are well trained
- ▶ The process is effective
- ▶ The organization structure supports the process flow
- ▶ Suppliers/subcontractors deliver compliant products



Training

- WTP will train new employees and re-train current staff of SQRs and SQAs incorporating lessons learned from the Vendor CGD issue.
- These training modules will lead an understanding of the CGD program.
- Personnel will demonstrate proficiency in their roles as PEs, SQRs and SQAs after the training has been given.

Procurement Engineering

- WTP will use industry recognized guidance for CGD in the flow down to suppliers/subcontractors
- WTP will use the same guidance in its process and will audit the suppliers/subcontractors for compliance to those documents.
- SMEs (Procurement Engineers) will be inserted into the process for CGD procedure review/acceptance, CGD plan review/acceptance, and participation on supplier/subcontractor audits/surveys
- Safety functions will be specified in a clear and concise manner in WTP procurement documents.
- Future WTP procurements will incorporate the results of the Vendor CGD RCA.

Suppliers/ Subcontractors

- Suppliers/subcontractors will understand their corrective actions resulting from the Vendor CGD RCA.
- Suppliers/subcontractors will fully understand the requirements of the WTP procurement documents, especially how they relate to CGD.

Oversight

- WTP will have an integrated supplier/subcontractor oversight program that is well coordinated with engineering, procurement, construction, and quality assurance.
- The oversight program will have an expanded trending aspect (to include, for example, SDDRs and QDRs) and supplier/subcontractor performance measures.
- WTP will have SQRs armed with expanded R2A2s (beyond the Material Acceptance Plan) to ensure that the essential elements of the CGD program are being followed.
- WTP supplier qualification process will be performance based and will include SMEs on each audit/survey.



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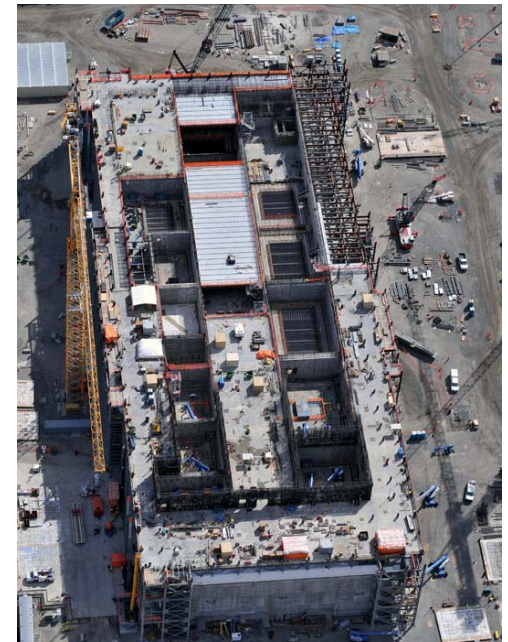
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Effectiveness Reviews

- Effectiveness reviews concluded that there was a high level of awareness of the CGD issue and the associated process improvements
- Document reviews and interviews showed:
 - Project personnel are adequately executing current processes
 - Procedures and procurement packages contained sufficient detail
 - Suppliers and subcontractors have acceptable processes and understanding of requirements



Effectiveness Reviews

Recommendations from reviews:

- Enhance processes to formally integrate and analyze data from oversight activities among Supplier Qualification, Supplier Quality, Engineering, Procurement Engineering, and Construction
- Develop a Procurement Engineering desk top guide
- Enhance the Procurement Engineering training and mentoring program
- Formalize expectations for effectiveness reviews and provide associated training
- Re-evaluate the charter for the Vendor Review Board based on current project and supplier performance



Open Group Discussion

- ✓ Lessons Learned
- ✓ Successes and Shortcomings of Approach
- ✓ Further Actions Needed





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Quality Assurance Summit Issues Identified During Commissioning

Depleted Uranium Hexafluoride Conversion Project

Presenter: Jack Zimmerman

February 17, 2011



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Project Overview

- Design, construct and commission DUF6 Conversion facilities at Portsmouth, OH and Paducah, KY to convert the DUF6 inventory at Portsmouth and Paducah to uranium oxide
- Conversion is accomplished by reaction of DUF_6 with steam and hydrogen in single-stage fluidized bed conversion units
- Products are uranium oxide and hydrofluoric acid (55% HF aqueous)
- Each Plant consists of thirty-five major systems including process and balance of plant.
- Hazard Category 3 Nuclear Facility with significant chemical hazards



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Project Status

- Construction of two conversion facilities completed in parallel
- Completed two Operational Readiness Reviews (one for each facility)
- The hot testing and ramp up to full operations is in progress
- Completed proof of process and initial production of oxide product
- Reached approximately 85 percent capacity on a single line basis



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Approach to ORR

- ◆ **Certification and Verification plan documented the DOE IPT day-to-day oversight processes verifying both contractor's and DOE's readiness.**

- ◆ **Function:**
 - ✓ Documented or referenced oversight performed during design and construction.
 - ✓ Identified the process used to verify both contractor's and DOE's readiness for operations.
 - ✓ Completed Plan provided or referenced evidence used to make field element readiness determination for ORR.



Readiness Preparation Lessons Learned

- It is vital to establish and then clearly communicate the level of readiness expectations to all employees.
- Senior Management must hold high expectations and avoid check the box mentality in approach to readiness.
- Starting and stopping Contractor Operational Readiness Review has greater impact on schedule than ensuring true readiness prior to the declaration.
- Establishment of Joint Line Management Review Board was positive in ensuring consistent expectations for readiness level by functional area.



Quality Issues Affecting Testing

- Post Maintenance Restoration
 - Loose bolts (flange and pump mount)
 - Return of system configuration/Valve lineup
 - Appropriate post-maintenance testing to assure performance

- Foreign Material Exclusion is Critical
 - H2 Regulator failed due to plastic with a hand written note



HF Piping Issue

- On 12/12 an HF Alarm of 1.03 ppm was received during testing of plant operation and a plant shutdown was initiated.
- A spool section of lined pipe was determined to have a leak and in the process of torquing the flange another HF alarm was received.
- The pipe spool was removed and the inner lining was discovered to be cracked.
- On 01/09 an HF alarm was received during testing of plant operation and the plant was shutdown.



HF Plastic Pipe Systems

- HF Recovery (material: Polypropylene lined CS) – 1, 1.5, & 2 inch Dia. Pipe and field swaged fabrication
- HF Storage (material: Polypropylene lined CS) – 2 & 3 inch Dia. Pipe and field swaged fabrication
- HF Transfer (material: Polypropylene lined CS) – 2 inch Dia. Pipe and field swaged fabrication
- Scrubber Skid (material: Polypropylene lined CS) – 1” inch Dia. Pipe and thermalok shop fabrication
- Plant Off-gas System (material: polyvinylchloride) – 1 inch field installed

Focus Area: Field fabricated polypropylene (PP) lined CS pipe with swaged sealing surface (HFR, HFS, & HF Transfer) due to them being under liquid pressure.

Scrubber skid was not evaluated due to Thermalok configuration and shop manufacturing process.

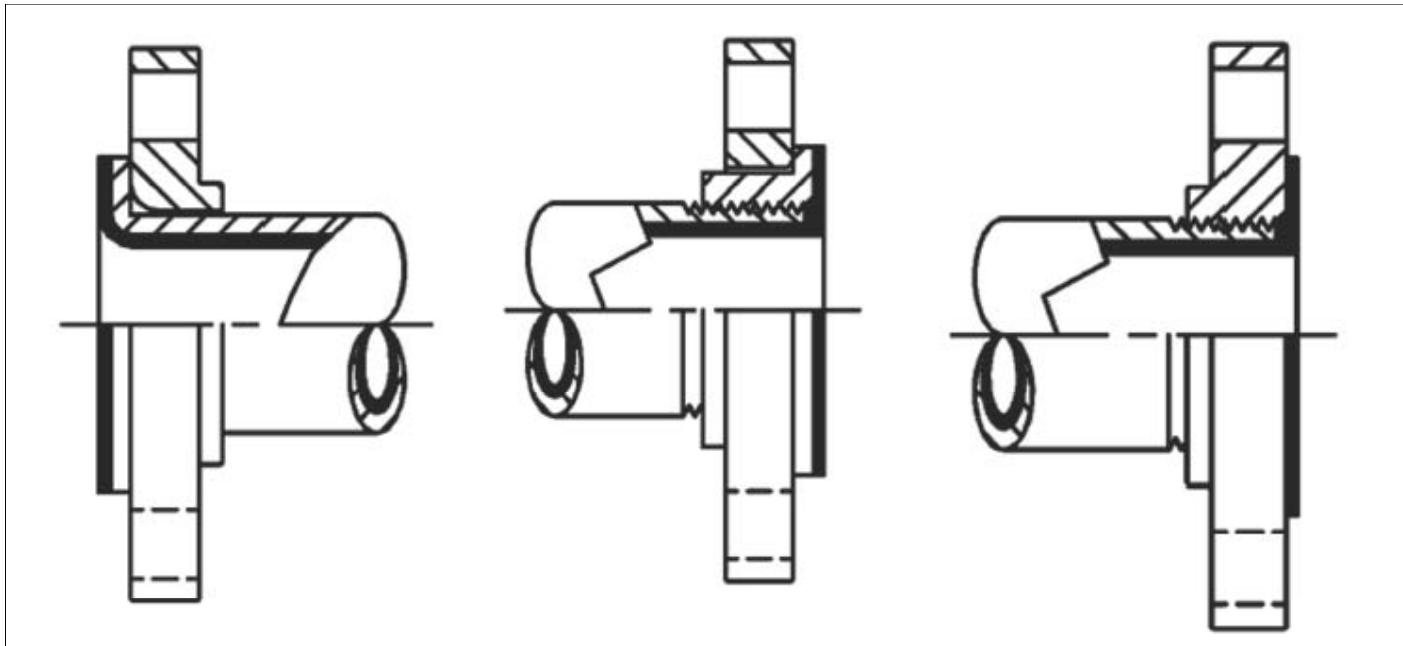
Process Off-Gas Systems was not evaluated due to atmospheric pressure or PVC material

Bent Piping was not evaluated due to them being shop fabricated



Plastic Lined Pipe Spools

FLANGE TYPES



ROTATABLE FLANGE
(THERMALOK TYPE)

THREADED
ROTATABLE FLANGE
(SWAGED TYPE)

THREADED
FIXED FLANGE
(SWAGED TYPE)



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Sampling Protocol

- Visual Inspection Criteria
 - No radial crack perpendicular to the pipe axis
 - No through cracks as determined by the spark test (method commonly used in lined pipe industry)
 - For threaded pipe spool - No loose flanges
 - Surface Flaws to be sectioned by Metallurgist to determine if they are cracks
 - Flange sealing surface (minor cleanup is allowed) does not count as a defect since it passed the pressure test without leaking



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Acceptance Criteria

- Major Defect Definition
 - Any radial crack perpendicular to the pipe axis
 - Any defect that was validated by sectioning to be a radial crack and is not a fabrication imperfection (such as lapping)
- Minor Flaws
 - Flange face imperfections: passed the hydro-test, no threat to imminent failure, some service life may be impacted
 - Flange cleanliness: passed the hydro-test, no threat to imminent failure, some service life may be impacted
 - Fabrication flaws: passed the hydro-test, no threat to imminent failure, some service life may be impacted
 - Loose Flanges: passed the hydro-test, no threat to imminent failure, some service life may be impacted



HF Pipe Spools (Paducah)

Location	Spools Inspected (Field)	Potential Defects	Loose Flanges	Thread Engagement	Cracks
HFR-Line 1	10	10	0	1	0
HFR-Line 2	0	0	0	0	0
HFR-Line 3	10	10	0	0	0
HFR-Line 4	10	8	0	0	0
HFS	10	2	0	0	0
Totals	40	30	0	1	0



HF Pipe Spools (Portsmouth)

Location	Spools Inspected (Field)	Potential Defects	Loose Flanges	Thread Engagement	Cracks
HFR-Line 1	2	1	0	0	0
HFR-Line 2	15	11 (1)	2	0	0
HFR-Line 3	12	5	0	1	0
HFS	4	0	0	0	0
Totals	33	17	2	1	0

Note 1. Flange has a sealing surface gouge but passed the leak test.



Sectioning Results

22 Spools sectioned

- No radial cracks found
- 8 “abnormal” plastic forming conditions existed. Confirmed by the metallurgist and manufacturer’s SME as normal flashover from manufacturing process.
- No significant defects identified.



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Quality Assurance Summit

Sodium Bearing Waste Treatment Project

Insufficient QA/QC Staffing

Presenters: Robert Thompson, CWI and Greg Hayward, DOE-ID

February 17, 2011



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SBWTP Project Status

- Purpose: construct and operate a steam reformer to convert almost 1M gal sodium bearing tank waste to steam reformed product
- Cost: \$533M (cost cap recently negotiated)
- Component/system testing in progress
- Startup scheduled for December 2011



SBWTP Quality Issues

- Quality Risk Underestimated
 - Impact due to lack of nuclear experience of
 - QA/QC
 - Engineering, supervision, document control and other key personnel
- Work Control and Documentation Compliance
 - Lack of line management oversight
 - Lack of QC oversight
 - Lack of nuclear documentation discipline
- Vendor Component Quality and Documentation



Work Control and Procedure Compliance Issues

- Workforce lacked nuclear rigor
 - Craft, engineering, first line supervision, QC
 - Procedural compliance & attention to detail



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Examples

- Work package compliance issues
 - Over 6000 identified non-compliances
 - Use of unapproved drawings for construction
- Piping Traveler compliance issues
 - Material ID errors
 - Welder ID errors
 - Weld Procedure ID errors
 - Incomplete forms
 - Lack of QC sign offs of inspection steps



Examples

- NDE Inspection record compliance issues
 - Use of correct procedures
 - Using procedures correctly
 - Timely completion of reports



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Work Control and Procedure Compliance Remedies

- Identify compensatory measures early to increase:
 - Line management accountability & self assessments
 - QC inspection
 - QA audit frequency
- Address craft and foremen lack of discipline
 - Procedural compliance is essential
 - Rework rate is too high
 - Quality failures consume cost & schedule contingency
- Aggressive verification of corrective actions



Vendor Quality and Documentation Issues

- Although Vendors willing to correct problems – schedule impact can be significant
- Identify compensatory measures early
 - Major procurements: early planning critical
 - Increase vendor inspections/onsite inspectors
 - Increase receipt inspection planning and inspections
 - Plan compensatory measures
- Aggressively follow up on corrective actions
- Limited qualified and willing domestic vendors
 - May necessitate use of international vendors
 - Commercial grade dedication can help - not simple or quick



Vendor Quality and Documentation Examples

- Structural Steel
 - Non-planar surfaces
 - Welds undersized
 - Hole location misalignment



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Vendor Quality and Documentation Examples

- Process Gas Expansion Bellows
 - Teflon © Fabric Bellows de-lamination
 - Component leak rate



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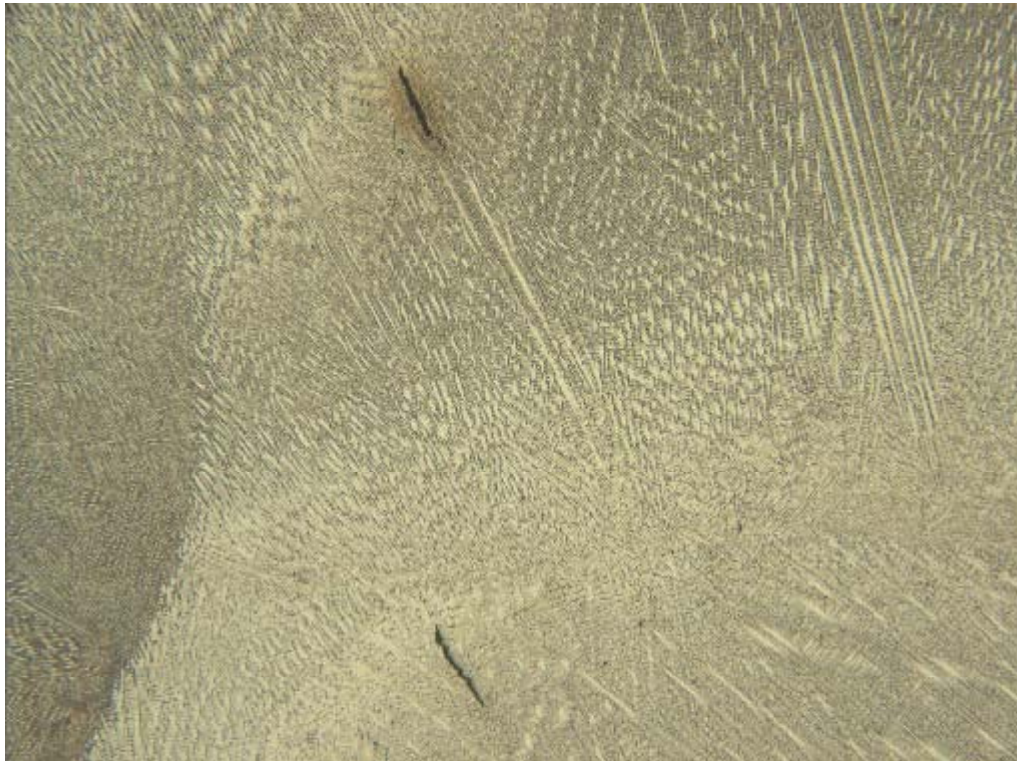
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Vendor Quality and Documentation Examples

- Vessel Fabrication
 - Weld compliance and acceptance
 - Documentation completeness



Micro cracking of Haynes Alloy vessel head welds



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Vendor Quality and Documentation Actions Taken

- Increased SME oversight
 - CWI
 - DOE
- Increased QC inspections
 - Hired additional inspectors
 - Use of CWI inspectors where appropriate
- Third party assist visits invaluable
- Increased audits and surveillances

Staffing Issues Mitigation

- Contracted for more QC inspectors with nuclear experience
- Utilized CWI resources to supplement construction QC
- Additional training for inspectors on work control, record keeping, and document control
- Combined CWI and URS Construction QA
- Added additional QE support for inspection planning and document reviews
- Increased line management supervision and oversight



Avoiding Quality Problems – Lessons Learned

- Conservative QA Risk Assumptions
 - Nuclear experience across the board
 - Lack of NQA-1 qualified vendors and suppliers
- Aggressive and timely oversight - DOE and CWI
 - Early identification of issues
 - Meaningful corrective actions
 - Verify corrective action effectiveness
 - Revisit corrective actions if issues recur



Conclusion

- Complex nuclear construction is very challenging
- The work force, suppliers, and QC Inspectors need to be qualified and experienced for nuclear industry work control and procedure compliance
- Quality planning needs to be expanded to address risks early
 - Sufficient trained and qualified QA/QC workforce
 - Qualified vendors





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Quality Assurance Summit

Supplier Evaluation & Oversight Lessons Learned

Salt Waste Processing Facility

Dave Tuttel
Director Quality Assurance, Parsons

February 17, 2011



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Contract Requirements

- Flow down Requirements
 - Documentation / Submittal requirements
 - Final documentation package requirements
 - Schedule, penalties and incentives
- Resident Inspectors
 - Identify resident inspectors in the requisition
 - Invoke oversight for suppliers whose performance does not meet expectations
- Hold & Witness Points
 - Identify oversight requirements in the Requisition
 - Enhanced supplier understanding
 - Detailed and defined expectations



Contract Requirements (continued)

- Supplier Acquisition Planning
 - Require an acquisition plan from the supplier
 - Commercial Grade Dedication per NQA-1-2004, Requirement 7, Section 700
 - Procure from NQA-1-2004 qualified suppliers
- Access Requirements
 - Right of access for Parsons, subcontractors, teaming partners, and DOE
 - Clearly defined “Unfettered” right of access
- Supplier Grading



Supplier Evaluation Process

- Evaluation
 - Evaluation of **technical** and quality capabilities
 - Personnel
 - Floor Space, equipment, crane capacity, special requirements
- Team Approach
 - Applicable Engineering Disciplines, Weld Engineering, QA, appropriate Subject Matter Experts (SME), NDE Certified Level III Inspectors
- Evaluation Team Composition
 - Lead Auditor; 1-2 additional QAEs; 1 or more SMEs; 1 or more Engineers
- Evaluation Duration
 - Whatever is necessary to determine the adequacy, effectiveness, and implementation of the supplier's QA program
 - Typically, minimum of 4 days depending on scope



Bid Evaluation Process

- Do your Homework
 - Research supplier performance, know their history
- Best Value in lieu of Low Price/Technically Acceptable
 - Allows for adequate competition
 - Not totally dependent on cost
 - Establishes more of an “even playing field”
 - LP/TA – “*You Get What You Pay For*”
- Sr. Management Involvement (Procurement, Engineering, Construction, QA)



Bid Evaluation Process (continued)

- Formal Evaluation Process
 - Involves all applicable functional areas in the pre-planning
 - Formal Request for Proposal with specific submittals prior to award
 - Documented technical and quality evaluations
 - QA facility Supplier Evaluation of the top candidate
 - Request for Best and Final Offer
 - Award based on “Best Value”, which may not be the lowest cost



Supplier Oversight Plans (SOP)

- Formally Documented and Procedure Driven
 - Required for high risk (critical) procurements
 - Defines additional activities planned to assure successful completion of the contract
- SOP Elements
 - Establishing frequency of supplier shop reviews
 - Determining technical representatives and SMEs
 - Determining frequency of quality and technical rotation
 - Verification of flow down to subtier suppliers
 - Special considerations/reviews for fabrication welding processes
 - Increased shop oversight by applicable SMEs at critical junctures



Supplier Oversight Plans (SOP) (continued)

- Oversight/Representation
 - Engineering/Construction/Fabrication Oversight
 - Weld Engineering Oversight
 - Resident Inspector surveillance function/duties
 - QA/QC Oversight
 - NDE Oversight



Supplier Assessment Plans

- Identification of Hold and Witness Points
 - Per the applicable engineering and quality specification requirements
 - Engineering specified and QA selected
 - Code required, such as B31.3, ASME Section III, etc.
- Directly linked to Purchase Order Requirements
- Identification of sampling requirements
 - Based on ASME Z1.4
- Responsibility of the Resident Inspector/Surveillance Representative to ensure supplier compliance with SAP requirements

Fabrication

- Pre-Fabrication Meetings
- Adequate Resources
 - QC & NDE
 - Shop Supervision / Foreman
 - Experience
 - Retention
- Status Meetings
 - Contract Management
 - Change Control
 - Production
 - QA
- Fitters / Helpers
 - Weld Repairs
- Welder Qualification
 - Weld Joint Workmanship Standards
 - Evaluate exceeding Code requirements for welder quals
 - Welder Retention / Turnover
 - Weld Reject Rate



Release for Shipment

- Final Quality Data Package Review
 - Includes records required by the procurement documents, as applicable:
 - Certificate of Conformance (C of C),
 - Completed fabrication travelers,
 - Material certifications,
 - Inspection records,
 - Test records,
 - NDE records (including radiographs),
 - Weld maps,
 - As-built drawings,
 - Nonconformance Reports (NCRs),
 - Supplier Deviation Requests (SDR),
 - Signature log
- Reviewed for acceptance by the QA Representative prior to authorizing shipment release (Hold Point)



Questions

- ????



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Quality Assurance Summit

Supply Side Lessons Learned - Strategies/Counter Measures

Uranium Processing Facility (UPF)

Presenter: Dominic J. Canazaro, UPF QA Manager

February 17, 2011



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Project Scope

UPF, currently under design, and HEUMF, the new storehouse for weapons-grade uranium, will consolidate the storage and processing of all enriched uranium at Y-12 into a smaller and more secure centralized area. With the new UPF, Y-12's high-security area will shrink 90%, from 150 acres to 15 acres.

Designed to meet America's national security demands for the next 50 years, UPF replaces 800,000 square feet of Cold War era built facilities. At 350,000 square feet, the leaner, more efficient and modern UPF consolidates the nation's enriched uranium processing needs while reserving space for future research and development.



Project Status

Current project completion is set for 2024

Current Design Status

Site Prep and Long Lead (LL) Equip. = 100%

Overall Design = 47%

Current Staffing (FTEs)

B&W Engineering 126

BOA Engineering 187

B&W Non-Engineering 117

Contractor Total 430

YSO 7



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Project Procurement Status

UPF project is currently in the early stages of procurement of Long Lead Equipment and Site Preparation Services

- 1 Engineering support Services contract currently active
- 11 Long Lead Equipment Specifications (4 LL are “Q” with 3 of the 4 Commercial Grade Dedicated (CGD))
- 2 initiated Requests for Proposal (RFP) issued
- 1 Supplier Facility Survey conducted
- First Supplier QA Audit performed 01/31/2011

Lessons Learned

- UPF Sources of Lessons Learned
 - Highly Enriched Uranium Materials Facility (HEUMF) and other Line Item and General Plant/Equipment Projects at Y-12
 - Mixed Oxide Fuel Fabrication Facility (MOX)
 - Waste Treatment Project (WTP)
 - Chemistry & Metallurgy Research Replacement (CMRR)
 - Y-12 Operations and Systems Engineering
 - DOE national Lessons Learned database and other sources



Lessons Learned (Continued)

- Procurement Strategies should be developed with the maximum consideration of the use of Commercial Grade Dedication (CGD) by the project with CGD assistance to prime and sub-tier Suppliers and Subcontractors performing CGD activities utilizing a dedicated Procurement Engineering group.
- Quality requirements need to be:
 - Identified early in the life of the project and configuration controlled throughout the life of the project
 - Clearly specified in procurement documents
 - Discussed with the supplier to ensure the requirements and expectations are understood

Lessons Learned (Continued)

- Supplier/Sub-tier supplier oversight (surveys, audits, shop and receiving inspection) needs to be:
 - Identified in the project budget
 - Communicated to the supplier
 - Focused on critical characteristics
 - Executed
 - Monitored to identify performance weaknesses
 - Enhanced if performance weaknesses are identified



Nuclear Supply Chain Experience

Industry Experience with Supply Chain to date:

- Failure to recognize that the supply of Important To Safety/Safety Related equipment and services may not be a business-as-usual condition
- Failure of Suppliers to effectively implement, monitor, and assess their own QA Program
- Failure to read and comprehend all PO requirements
- Failure to comply with all PO requirements
- Failure to recognize that change is authorized only through PO Revision or other approved disposition requests
- Failure to communicate or pass PO requirements across all affected elements of the Supplier organization
- Failure to flow and enforce PO requirements through their supply chain



Nuclear Supply Challenges

- Number of domestic suppliers with established nuclear (NQA-1 2008/2009-1a) programs
- An atrophied domestic nuclear supply base
- Foreign supplier programs usually limited to commercial (ISO-9000) programs
- Number of qualified suppliers for competitive bidding
- Number of suppliers that will bid NQA-1 orders
- Sub-tier supplier qualifications



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Consequences from Supply Chain Failures

- Delayed Material and Equipment Shipments
- Delayed Invoice Payment
- Back charges to the Supplier
- Suspension of Work
- Termination of Procurement
- Increased cost to the Government
- Increased exposure to DOE PAAA regulatory enforcement
- Negative publicity
- REWORK



UPF Supply Side Expectations



- Best-In-Class product quality
- Effective Supplier commitment to quality at all levels
- Effective, mature, and compliant Supplier QA Program implementation
- Strict compliance to purchase order requirements and engineering document submittals
- Compliant and defect-free items and documentation delivered the first time



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Strategies/Counter Measures

- Procurement Strategy will utilize extensive use of CGD by UPF and UPF CGD assistance to prime (first line) Suppliers and Subcontractors
- Project Budget includes extensive oversight of suppliers/sub-tiers
- Early development of sourcing and procurement strategies for individual procurements
- Use of cross functional Source Selection teams in review of procurement specification , Requested for Proposal (RFP's) and review of bid submittals and final supplier selection
- On site supplier capability surveys and review and approval of supplier QA programs prior to start of work
- Face-to-face meeting with supplier at supplier's facility to kick off contract



Strategies/Counter Measures (Continued)

- Supplier oversight focused on critical characteristics
- On-site verification of QA program implementation at start of work process (Design/Procurement/Fabrication) utilizing Subject Matter Experts (SME's) in Software Quality Assurance (SQA), Commercial Grade Dedication (CGD), and Fabrication Processes (Welding/NDE)
- Ongoing oversight of suppliers and sub-tier suppliers to identify performance weaknesses
- Work process and pre shipment shop inspection
- Dedicated material and equipment receipt, inspection and storage facility



Strategies/Counter Measures (Continued)

Commercial Grade Dedication

- Dedicated Procurement Engineering organization in support of the CGD process
- Reengineered and improved Commercial Grade Dedication (CGD) process (under development with Chemistry & Metallurgy Research Replacement project) to include:
 - First process: Maximum Self-performance of CGD
 - Second process: NQA-1 suppliers performing CGD/UPF assistance (review and approval of supplier/sub-tier CGD procedures and plans)
 - Third Process: Mix of self-perform and NQA-1 supplier CGD
 - Fourth Process: Subcontract CGD services
- “Q” items/services procured CGD will be procured in accordance with a CGD and Material Acceptance Plans



Strategies/Counter Measures (Continued)

- For “Q” items/services not procured Commercial Grade Dedicated (CGD) the following will be performed:
 - NQA-1 QA Program review/acceptance, onsite NQA-1 capability surveys/QA program implementation audits of prime and selected sub-tiers
 - Page turn of procurement documents and Material Acceptance Plan (MAP) at the supplier’s facility
 - In shop surveillance focused on item critical characteristics
 - Factory acceptance testing w/SMEs
 - In shop release for shipment inspection
 - Receipt and installation Inspection



Questions

Questions or Comments



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