

#### Non-Power Production and Utilization Facility (NPUF) Construction Inspection Program (CIP)

U.S. Nuclear Regulatory Commission May 26, 2016



#### Construction Inspection Program Overview

Carl Weber Office of New Reactors

#### Background

- Generic CIP to cover NPUFs
  - Not all aspects will apply to every facility
- Sample based
- Focus on safety related systems, structures, and components (SSCs)
- Quality Assurance Program commitments
  - Corrective Action Program



#### Licensing and Oversight Responsibility





#### Inspection Manual Chapter (IMC) 2550

- NPUF-CIP: Single IMC
  - Facility Specific Assessment and Review Group (FSARG)
  - Inspection Report format
  - Enforcement (Traditional)
  - Overall Inspection Strategy
  - Assessment
- Transition to Operations.
- Qualification and Training for Inspectors addressed in IMC 1245



#### Inspection Procedures (IPs)

- Facility Construction
  - IP 69020, Inspections Of Structures, Systems And Components During Construction Of Non-Power Production and Utilization Facilities
- Quality of Construction
  - IP 69021, Inspections Of Quality Assurance Program Implementation During Construction Of Non-Power Production and Utilization Facilities
- Operational Readiness
  - IP 69022, Inspections Of Operational Readiness During Construction Of Non-Power Production and Utilization Facilities



#### Facility Construction Inspection Procedure

- Structures, systems and components (SSC) inspection procedure
- Sample selection will be based on safety significance (QL-1 systems)
- Potential inspection areas:
  - Foundations and buildings
  - Structural steel and supports
  - Piping restraints and supports
  - Electrical cable
  - Ventilation and confinement systems
  - Nuclear welding
  - Fire protection systems

- Structural concrete
- Piping systems
- Mechanical components
- Electrical systems and components
- I&C systems
- Structural welding
- Inspections include applicable aspects of QA Program implementation



#### Quality of Construction Inspection Procedure

- Quality Assurance (QA) Implementation IP
- Consists of 3 parts
  - One Time QA Implementation Inspection.
  - Periodic QA Inspections (at least annually):
    - Corrective Action Program (CAP) Review.
    - Design Control, Nonconformance Control, Audits.
    - Other Criteria (as needed).
  - Reactive Inspections (e.g., problem areas identified during SSC inspections, adverse trends, etc.)
- ANSI 15.8 requirements



#### Operational Readiness Inspection Procedure

- Operational Readiness Assessment Inspection
  - One time inspection
  - Conducted after licensee submits operating license application and near the end of construction activities
  - Covers status of CIP completion, and may include programs needed for operations
- Inspection supports decision on operating license application determination





#### Construction Oversight and Inspections

William Gloersen Region II

#### Oversight and Inspections: Communication

- Establish and maintain frequent communications with NRC
- Establish point of contact for NRC RII construction project manager
- Conduct weekly teleconferences with the following participants:
  - NRC licensing (HQ) and construction project management staff (RII)
  - SHINE licensing and construction project management staff



#### Oversight and Inspections: Communication

- Consider developing a construction status briefing sheet to facilitate the teleconference with the following information:
  - Construction status and schedule
    - Major milestones
    - Major activities in the past week
    - Major activities planned
  - NRC inspection schedule
    - Inspections completed
    - Inspections planned
  - Licensing Status
    - Key licensing actions
  - Meetings
    - SHINE drop-in visits to NRC HQ or RII
    - NRC management visits to SHINE
    - Public meetings



#### **Oversight and Inspections**

- Establish and maintain a restricted access electronic reading room for use by both NRC inspection and licensing staff
- Types of information provided in the electronic reading room
  - Licensing Documents
    - Construction Authorization
    - Quality Assurance Plan
    - Safety Analysis Report
  - Inspection Documents
    - Construction Schedules
    - Project Procedures
    - Condition Reports
    - Non-conformance Reports
    - Engineering documents and drawings
    - Construction photographs



#### Observations

- Develop strong partnerships with proven vendors
- Maintain critical oversight of work planning packages
- Perform intrusive and strategic inspections to confirm work is performed correctly prior to major undertakings and prior to NRC inspections



#### Observations

- Develop a robust corrective action program
  - Identify, classify, and track conditions adverse to quality
  - Ensure proper implementation and closure of corrective actions are completed
  - Consider a Management Review Committee
- Safety Culture
  - Keep the terms simple and usable for the construction staff
  - Encourage staff to have a questioning attitude
  - Demonstrate importance daily and reward behaviors
- SHINE Management Oversight
  - Challenge the status quo
  - Be seen in the field and model the correct behaviors and priorities – seek to understand





#### Construction Lessons Learned: New Reactors

Phil O'Bryan Office of New Reactors

#### **Discussion Topics**

- Design Control Lessons Learned
- Construction Lessons Learned
- Corrective Action Program Lessons Learned



#### **Design Control Lessons Learned**

- Unclear Licensing Basis
  - New aspect of design that wasn't originally described or addressed in Construction Permit
  - Misapplication of Codes/Standards in licensing basis
- Lack of awareness of licensing basis commitments
  - Use of standard methodologies not in licensing basis
  - Misinterpretation of Codes/Standards
  - Use of wrong revision of Codes/Standards
  - Incorrect, or lack of, vendor specifications
  - Field changes poorly researched



#### **Construction Lessons Learned**

- Poor vendor quality, not identified by receipt inspection
- Poor Work Packages/Procedures
- Constructability & Field engineering
- Poor Supervision/QC oversight



#### Corrective Action Program (CAP) Lessons Learned

- Safety Conscience Work Environment and workers new to nuclear industry
- Use of multiple CAPs/QAPs
- Use-as-is justifications
- Use of CAP to reconcile deviations and licensing basis





#### Construction Lessons Learned: Fuel Cycle Facilities

#### David Tiktinsky Office of Nuclear Material Safety and Safeguards

#### Topics

- Commitments in licensing documents
- Change process
- QA programs
- NRC observations









#### Commitments Made in Licensing Documents

- Clear commitments in licensing documents (e.g. codes, standard and exceptions)
  - NRC inspects against licensing commitments
  - Interpretations of code requirements
  - Clear language
  - Deviations and exceptions from codes and standards
  - Descriptions versus commitments



#### **Change Process During Construction**

- Change requirements used for evaluating changes to site, structures, processes, systems, components, etc. (for ISA summary)
- Change process for license application
  - NRC reviews and inspects process and results
  - Reassess criteria based on actual experience



#### NRC Observations

- Design control
- Vendor oversight
- Inspection



#### **Design Control Inspection Findings**

- Translating design requirements (including codes and standards) into design and construction documents and properly implementing design documents
- Initiating, performing, verifying and documenting design changes and evaluating the impact of those changes on the design bases



#### Design Control Corrective Actions

- Training
- Surveillance activities at vendors
- Documentation of code deviations
- Procedure revisions



#### Supplier and Vendor Inspection Findings

- Compliance of inspection procedures with respect to ASME codes
- Oversight of vendors QA activities
- Documentation of weld repair procedures
- QA examinations of repair welds not performed as required by procurement specifications
- Vendor welder qualification program
- Inadequate documentation of weld repair/rework activities



#### Supplier and Vendor Corrective Actions

- Training related to preparing technical justifications
- Revised procedures to provide project personnel instructions on handling supplier issued non-conformance reports
- Additional oversight of vendors QA
- Clarification of procurement specifications



#### Lessons Learned from Industry Representative\*

- Accepted Industry Practice does not necessarily affect the NRC's Position
- Emphasis on survey of the supply chain not realistic, unless accounted for when developing procurement strategy for how to establish a supply chain for a CGI
- The completeness of the evaluation, survey results, test results and the final acceptance records are important for CGI as any other nuclear component

\*Presented by Rodney Whitney, MOX Services at NRC vendor oversight workshop in August 2012.



# Challenges to Quality Construction (Industry)

- Ensuring vendors and construction contractors are implementing quality assurance requirements
- All organizations should be trained on and use similar corrective action programs
- Designing and redesigning as construction continues impacts inspection resources and scheduling
- Design control and verifications
  - Does the field design match the approved design?



#### Vendor-Related Lessons

#### Learned/Recommendations (Industry)

- Know your supplier's (and your supplier's supplier) fabrication and CGD processes
- Demand objective evidence that suppliers and subsuppliers have appropriate QA programs & CGD Processes in-place to assure implementation is effective
- Otherwise you may see or get:
  - Procedures not workable or developed but not followed
  - Implementing procedures don't consistently address requirements
  - Incapable of identifying critical characteristics
  - Lack of experience with nuclear regulations and QA requirements
  - Control of sub-suppliers by prime suppliers is poor



#### Vendor-Related Lessons

#### Learned/Recommendations (Industry)

- Allow vendor flexibility in sampling plans due to their knowledge of particular circumstance of their supply chain knowledge
  - Allow vendors to propose alternatives for your acceptance
  - Experience has shown that QL-1 (IROFS) vendors vary dramatically in their knowledge of standard sampling plans and implementation of sampling plan methodology
  - Example: Destructive/Non-destructive testing of raw materials



#### Vendor-Related Lessons Learned/Recommendations (Industry)

- Vendor Communication with project CGD group is very important.
  - Placing CGD personnel in the vendor shop can be very beneficial.
  - Train Subcontract Technical Representatives to understand project CGD positions, since they are the first line of technical oversight of the vendor.
  - Understand foreign company quirks.



## Vendor-Related Lessons

Learned/Recommendations (Industry)

- Aggressive management and oversight of CGD programs is prudent
  - Review all vendor Commercial Grade Dedication plans and procedures initially.
  - Reviews may be stopped or lessened when confidence is gained with vendors program
- CGD acceptance process needs to be closely coordinated with receipt inspection capabilities





#### NRC Enforcement Program

#### Tom Marenchin Office of Enforcement

#### Purpose of Enforcement Program: Support NRC Mission

- Enforcement Action Should Be Used:
  - As a deterrent to emphasize the importance of compliance with requirements, and
  - To encourage prompt identification and prompt, comprehensive correction of violations



#### **Enforcement Tools**

- Formal Mechanisms (legally binding)
  - Minor violation
  - Non-cited violation (NCV)
  - Notice of violation
  - Civil penalty
  - Order
  - Demand for Information
- Administrative Actions (not legally binding)
  - Notice of Deviation (failure to satisfy non-binding requirement)
  - Notice of Nonconformance (contractor failure)
  - Confirmatory Action Letter (licensee agreement to take specified actions)



#### NRC Enforcement Process

- Identify
- Assess
- Disposition



#### Identifying Noncompliances

- What requirement was violated?
- How was the requirement violated?
- When did the noncompliance occur?
- How long did it exist?
- Who identified it and when?
- What is significance
- What is the root cause? (if known)
- Corrective actions?



#### Significance

- NRC consider four issues:
  - Actual safety consequences
  - Potential safety consequences
  - Potential for impacting the NRC's ability to perform its regulatory function
  - Any willful aspects of the violation



#### **Traditional Enforcement**

- Each violation assigned a Severity Level (SL)
  - SL I, II, III, IV, with SL I being the most significant and SL IV being the least significant on risk
  - Enforcement Policy Provides violation examples for each of the four SLs
    - Section 6.5 Facility Construction (10 CFR Part 50 and 52 Licensees and Fuel Cycle Facilities)
  - SL may be increased if violation determined to be willful



### Notice of Violation (NOV)

- A written notice setting forth one or more violations of a legally binding requirement
- NOV states:
  - When violation occurred (date)
  - Who violated requirement
  - Time and/or number of times violation occurred
  - Brief description of the violation (i.e., what actually happened resulting in the violation)
- A civil penalty may be issued in conjunction with NOV



#### Escalated Enforcement

- SL I, II, III violations Civil Penalties
- NOVs to individuals
- Orders to modify, suspend, or revoke NRC licensees or the authority to engage in NRClicensed activities
- Orders to impose civil penalties



#### **Enforcement Panel**

- All proposed escalated enforcement reviewed by enforcement panel
- Panel participants include OE, regional staff, headquarters staff, and, if needed, OGC
- Panel considers:
  - Facts of the violation and requirements
  - SL and violations examples in Policy
  - Whether Identification Credit is warranted
  - Whether Enforcement Discretion is appropriate
  - Whether a CP is appropriate
  - Whether to hold a PEC



#### Predecisional Enforcement Conference (PEC)

- Held if needed by NRC or requested by licensee
- Normally open to public
- Purpose to obtain information to assist enforcement decision:
  - Facts, Root Causes, Missed Opportunities
  - Corrective Actions taken or planned
  - Significance



#### References

• NRC Enforcement Policy

<u>http://www.nrc.gov</u> (select Electronic Reading Room, then Document Collections, then Enforcement Docs, then Enforcement Policy)

NRC Enforcement Manual

<u>http://www.nrc.gov</u> (select Electronic Reading Room, then Document Collections, then Enforcement Docs, then Enforcement Guidance, then Enforcement Manual)

 Issued Escalated Enforcement Actions
 <u>http://www.nrc.gov/about-</u> nrc/regulatory/enforcement/current.html

