

Regional Inspection Activities for Fuel Cycle Facilities

3rd NRC Workshop on Vendor Oversight
for New Reactor Construction
June 28, 2012

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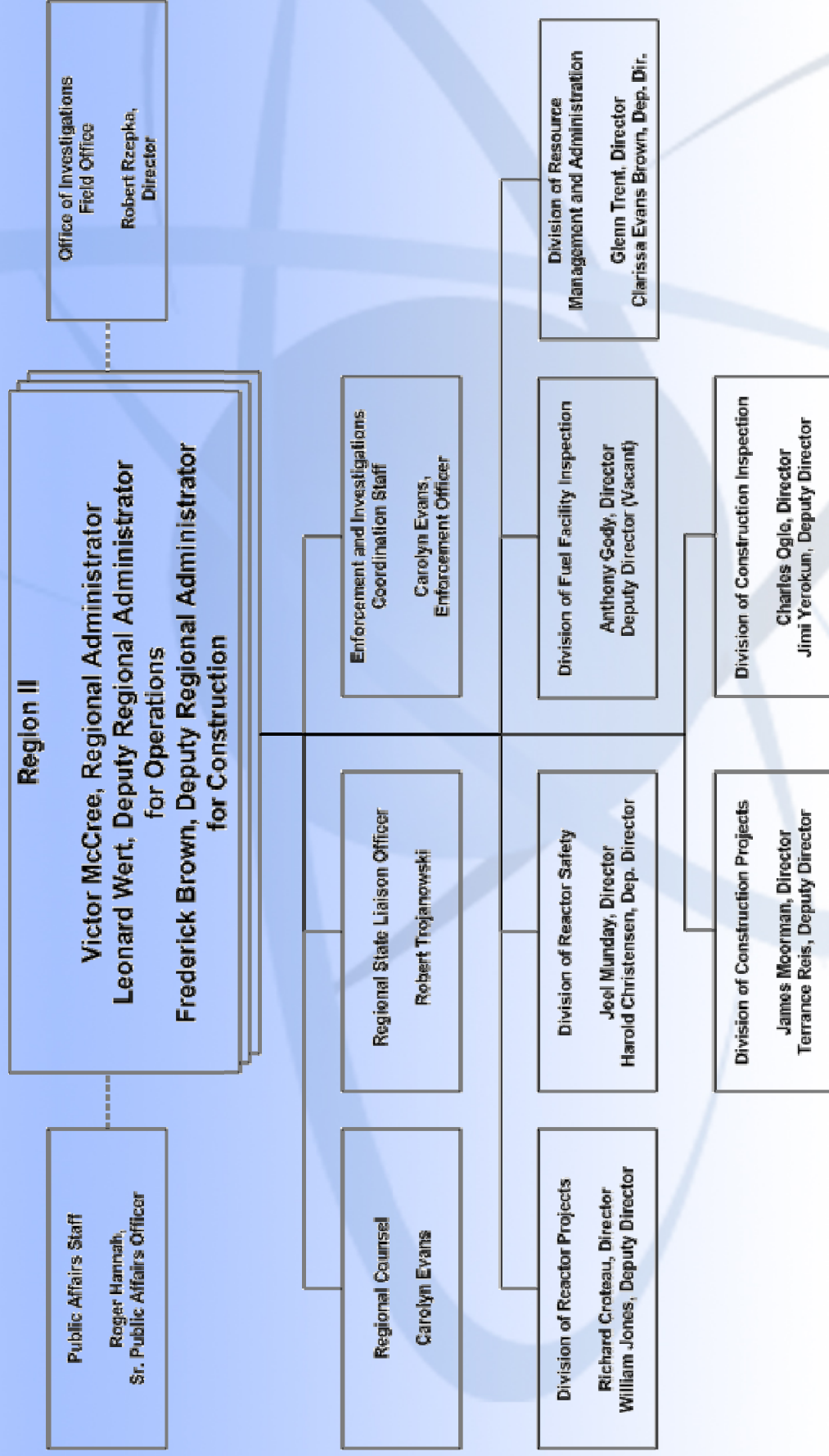


Presentation Outline

- **New Nuclear Facilities Organization**
- **Fuel Facility Construction Projects**
- **Regulatory Basis**
- **Quality Assurance Requirements**
- **Inspections**
- **Common Inspection Findings**
- **Summary**



Region II Organization





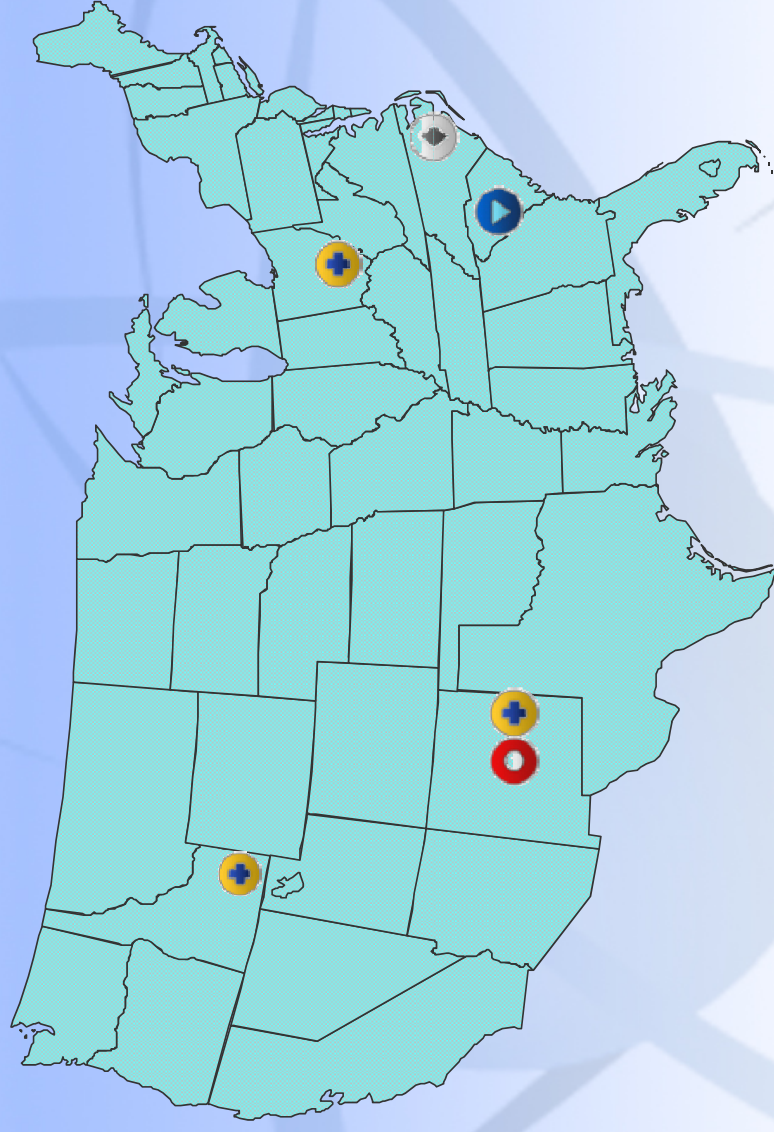
Mission Statement

- **To provide assurance in the safety of future operations at new nuclear facilities by ensuring that licensees and applicants construct the facilities according to approved design criteria, using appropriate practices and quality materials**



Fuel Facility Construction Projects

-  **Mixed-Oxide (MOX) Fuel Fabrication Facility**
-  **Louisiana Energy Services L.L.C., National Enrichment Facility**
-  **AREVA Enrichment Services (future construction)**
-  **American Centrifuge Project (future construction)**
-  **International Isotopes Fluorine Products Facility (future construction)**
-  **GE-Hitachi (future construction)**





Regulatory Basis

- **U.S. Nuclear Regulatory Commission**
 - **Title 10 CFR Part 70 – *Domestic Licensing of Special Nuclear Material***
 - MOX FFF
 - LES NEF
 - ACP
 - AREVA Eagle Rock
 - GE Hitachi Global Laser Enrichment
 - **Title 10 CFR Part 40 - *Domestic Licensing of Source Material***
 - International Isotopes Fluorine Products



Quality Assurance (QA) Requirements

- Plutonium processing and fuel fabrication plants
 - Title 10 CFR Part 70
 - § 70.22(f) Contents of applications
 - QA Program description required for review and approval by NRC
 - Applicant must address how the eighteen (18) criteria specified in Appendix B to 10 CFRR Part 50 will be applied (§ 70.23(b), Footnote 3)
 - § 70.23(b) Requirements for the approval of applications
 - QA Program must provide reasonable assurance of protection against natural phenomena and the consequences of potential accidents
 - Footnote 3: Appendix B of Part 50 will be used by the Commission in determining the adequacy of the QA Program



Quality Assurance (QA) Requirements

- **Plutonium processing and fuel fabrication plants (*continued*)**
 - **NRC issues Safety Evaluation Report approving QA Plan**
 - **QA Plan required via a condition to the Construction Authorization**
 - **Applicant expected to implement NRC approved QA Plan in working level procedures**



Quality Assurance (QA) Requirements

- Other fuel cycle facilities
 - § 70.64 Requirements for new facilities or new processes at existing facilities
 - § 70.64(a)(1) Quality standards and records
 - » Design must be developed and implemented in accordance with management measures, to provide adequate assurance that items relied on for safety will be available and reliable to perform their function when needed
 - » Management measures include configuration management, maintenance, training and qualifications, procedures, audits and assessments, incident investigations, records management, and *other quality assurance elements*



Inspections

- **§ 70.32(k) Conditions of licenses**
 - No person may commence operation of a uranium enrichment facility until the Commission verifies through *inspection* that the facility has been constructed in accordance with the requirements of the license
- **Construction Authorization or License Condition**
 - During construction of the facility, the inspection program set forth in § 70.55 will apply to all construction-related activities



Inspections

- **Fuel Cycle Construction Inspection Program**
 - **Inspection Manual Chapters (IMCs)**
 - **IMC 2630**
 - **Mixed Oxide Fuel Fabrication Facility Construction Inspection Program**
 - **IMC 2694**
 - **USEC Inc. Gas Centrifuge Facility Construction and Pre-Operational Readiness Review Inspection Programs**
 - **IMC 2696**
 - **Louisiana Energy Services Gas Centrifuge Facility Construction and Pre-Operational Readiness Review Inspection Programs**



Inspections of Vendor Oversight

- **Inspection Procedures (IPs) specified in IMCs 2630, 2694, and 2696**

- IP 88115 Supplier/Vendor Inspection (Construction Phase)
- IP 88114 Quality Affecting Item Procurement (10 CFR Part 21) and Commercial Grade Item Dedication Process
- IP 88106 Program Development and Implementation
- IP 88107 Design and Documentation Control
- IP 88108 Control of Materials, Equipment, and Services
- IP 88109 Inspection, Test Control, and Control of Measuring and Test Equipment
- IP 88110 Problem Identification, Resolution, and Corrective Action
- IP 88111 10 CFR Part 21 Inspection-Facility Construction



Inspections of Vendor Oversight

- **Scope and extent of inspection dependent upon activities at the inspection site**
- | <u>Vendor's Facility</u> | <u>Fuel Cycle Facility</u> |
|---|------------------------------------|
| • Management Controls | • Receipt Inspection |
| • Material Procurement | • Test and Inspection |
| • Fabrication and Assembly Controls | • Installation |
| • Test and Inspection, Tools and Equipment | • Corrective Action Program |
- **Inspection results documented in publicly available inspection reports**
 - **Violations and noncompliances dispositioned in accordance with NRC Enforcement Policy Manual**



Common Inspection Findings

- Eighteen planned inspections over last five years of vendors of fuel cycle facility construction projects
- No reactive inspections
- Types of vendor/supplier inspections:
 - Design and Engineering Services
 - Construction Services
 - Reinforcing steel
 - Process vessels
 - Fluid transport systems
 - Process enclosures
 - Fire dampers
 - Sintering furnace
 - Programmable logic controllers



Common Inspection Findings

- **Common Inspection Findings of Oversight of Vendors' QA Activities**
 - **Management Controls**
 - Failure to ensure that vendor services were controlled to assure conformance with specified technical and QA requirements
 - Failure to follow procedures affecting quality activities
 - Failure to adequately prescribe activities affecting quality in appropriate procedures
 - Failure to provide justification for “use-as-is” or “repair” disposition of nonconformance reports



Common Inspection Findings

- **Common Inspection Findings of Oversight of Vendors' QA Activities (continued)**
 - **Fabrication Controls**
 - Improper flow-down of QA requirements to vendors/suppliers
 - Failure of inspection procedures to meet code requirements during fabrication
 - **Corrective Action**
 - Failure to disposition supplier deficiency reports
 - Failure to require vendor to implement corrective action program
 - » Failure to determine the cause of identified conditions and to take corrective actions to preclude recurrence



Common Inspection Findings

- **Common Inspection Findings of Oversight of Vendors' QA Activities (continued)**
 - **Commercial Grade Dedication**
 - Less than adequate commercial grade dedication of QL-1 materials
 - » Failure to perform or verify that the required inspection and/or testing was accomplished to assure conformance with critical characteristics



Common Inspection Findings

- **Common Inspection Findings of Oversight of Vendors' QA Activities (continued)**
 - **Special processes findings**
 - 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



Summary

- NRC issues Safety Evaluation Reports covering the QA Programs and the licensee/applicant implements appropriate quality procedures
- NRC approved QA Programs become license or construction authorization conditions
- NRC conducts routine planned (and reactive) inspections to verify and assess implementation of the QA program



Summary

- **Inspections address management controls, design controls, fabrication controls, material controls, test control, special processes, and corrective action program**
- **Violations and nonconformances dispositioned through NRC Enforcement Policy**