



**U.S.NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

# Oversight of Nuclear Reactor Suppliers

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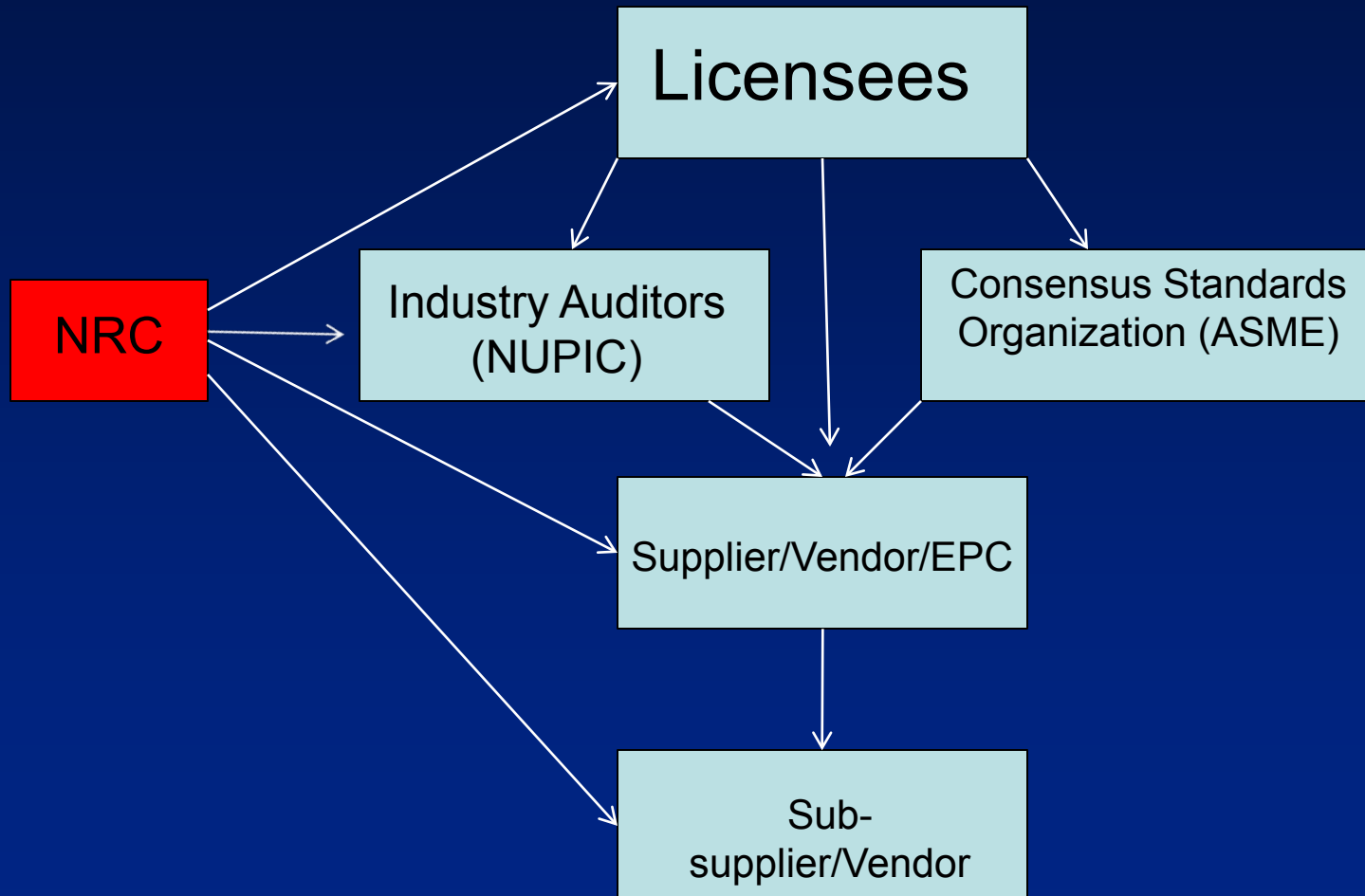
# Overview

- Oversight of Suppliers
- Key Inspections Findings
- Lessons Learned
- Licensee and Supplier Oversight
- Safety Culture
- Q and A

## Oversight of Suppliers

- The ultimate responsibility lies with licensees
- NRC verifies that licensees meet their responsibilities
- Licensees oversight of suppliers and sub-suppliers is key to new and operating reactor success

# Oversight of Suppliers



## Key Inspections Findings

- Based on NRC vendor inspection results, the NRC is concerned about a perceived lack of oversight of sub-suppliers
- Recent examples of a lack of rigor in the process relied on for qualification of sub-suppliers
  - Purdue University (Westinghouse)
  - Shaw Modular Solutions (Shaw Nuclear Services)
  - Obayashi (Westinghouse)
- Regulatory compliance issues are being identified at new suppliers and “seasoned” suppliers
  - Flowserve Limitorque

# Purdue University

## Commercial-Grade Dedication (Design Control)

- Did not identify the appropriate controls to ensure that the critical characteristics had been verified
- Did not verify that the necessary procedures had been developed to assure that all testing was identified and performed in accordance with written test procedures that incorporate the requirements and acceptance limits contained in applicable design documents
- Did not verify that the equipment chosen to measure the applied force to the test specimen was suitable for its intended function

# Obayashi Corporation

## Part 21

- Failure to adopt an appropriate procedure for evaluating deviations and failures to comply after the placement of a safety-related purchase order

## Quality Assurance Program

- Failure to establish a quality assurance program consistent with the applicable provisions of Appendix B to 10 CFR Part 50 consistent with a safety-related purchase order

# Shaw Modular Solutions

## Quality Assurance Program

- Failed to provide control over activities affecting quality in the quality assurance manual and failed to define the regulatory and industry standards to which the QA manual is committed

## Design Control

- Failed to ensure that design changes were subject to the same design control measures applied to original design

## Measuring and Test Equipment (Commercial Calibration)

- Failed to dedicate calibration service
- Allowed sub-suppliers to use commercial calibration services without dedication



# Shaw Modular Solutions

## Nonconforming Materials, Parts, or Components

- Failed to control a basic component that had open nonconformances identified on it
- For nonconformances with a conditional release, failed to identify in the work package the point that work may continue on the basic component

## Corrective Action

- Failed promptly correct conditions adverse to quality
- Failed to perform trend analysis as specified in purchase order

# Flowserve Limitorque

## Part 21

- Did not complete an evaluation within 60 days of discovery and failed to submit an interim report to the NRC
- Failed to adopt appropriate procedures to evaluate deviations and failures to comply
- Issued safety-related purchase orders without imposing 10 CFR Part 21 (or Appendix B to 10 CFR Part 50)

# Flowserve Limitorque

## Design Control

- Failed to establish measures to assure that applicable regulatory requirements and design basis are correctly translated into specifications, drawings, procedures, and design basis
- Failed to perform independent reviews of changes to software used in the manufacturing of safety-related actuators

# Flowserve Limitorque

## Control of Purchased Material, Equipment, and Services

- Failed to establish measures to ensure that purchased material, equipment, and services conform to procurement documents
- Performed an external audit of an approved safety-related supplier and did not evaluate the supplier's compliance to Appendix B (audited supplier against the requirements of ISO 9001:2000)

## Lessons Learned

- Deficiencies in sub-suppliers performance may not be detected based on an audit of the supplier
- Extent of condition should be required for significant findings
- Knowledge of regulatory and industry standards may be lacking (international and domestic)

## Lessons Learned

Licensee's role on the oversight process should include the following elements

- Consider the safety significance of the product or service
- Qualifications of the supplier and their sub-suppliers
- Adequate oversight of supplier and sub-suppliers work
- Periodic assessment

## Licensee and Supplier Oversight

- Audit Checklist
  - Are the questions asked sufficient to determine that the PO requirements and regulatory requirements are being met?
  - Is the objective evidence sufficient to demonstrate acceptability of quality?
  - Auditors need to be adequately trained to implement the audit checklist

## Licensee and Supplier Oversight

- ISO 9001 does not meet the requirements of Appendix B
- SECY-03-0117 reviewed ISO 9001-2000 against the existing framework of Appendix B
- SECY-03-0117 available at the NRC website at <http://www.nrc.gov/reactors/new-reactors/oversight/quality-assurance/qual-assure-regs.html>

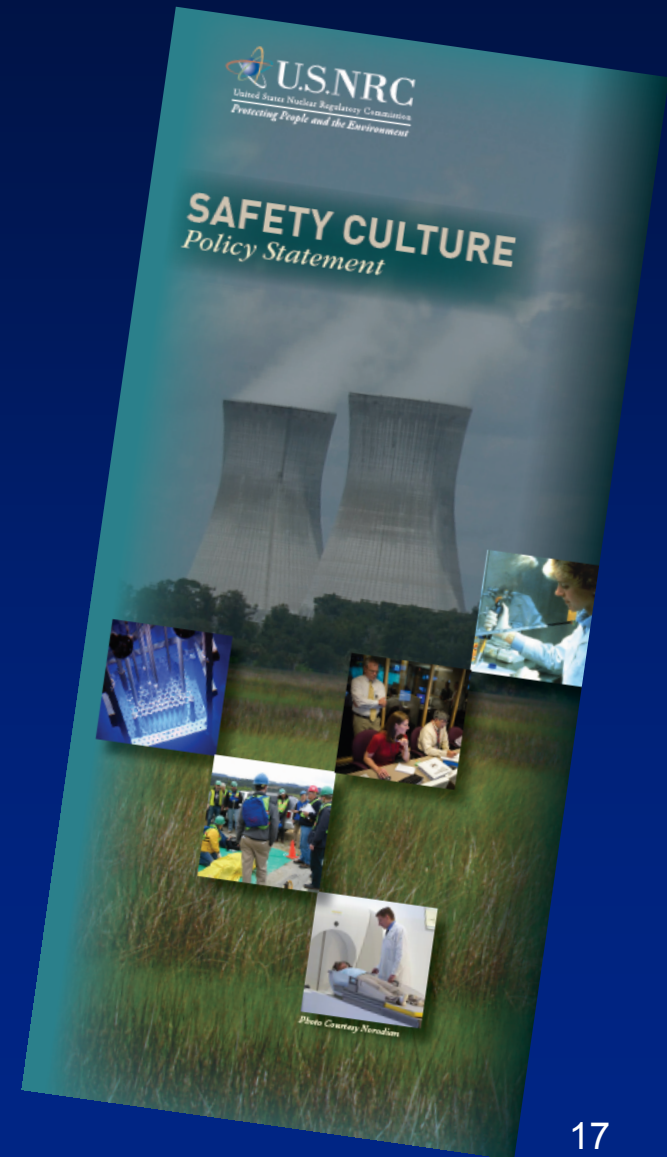


# Safety Culture

- The Commission defines **Nuclear Safety Culture** as the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.



**Consider safety culture at construction sites and vendors facilities throughout the supply chain**



## Conclusions

- Licensees should work with their suppliers to ensure that supplier and sub-supplier Appendix B and 10 CFR Part 21 programs adequately implement the requirements imposed in the procurement documents
- Suppliers and sub-suppliers should be fully knowledgeable of all regulatory requirements and technical specifications imposed by licensees and/or other suppliers in procurement documents



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**Questions ??**