COMMISSION BRIEFING SLIDES/EXHIBITS

PERIODIC BRIEFING ON NEW REACTOR ISSUES –

COMPONENT FABRICATION AND OVERSIGHT

JUNE 3, 2009

AUTORITÉ DE SÛRETÉ NUCLÉAIRE

International Cooperation on Vendor Oversight

June 3, 2009

Sebastien Limousin

ASN

Topics

- **ASN component manufacturing oversight**
- **Lessons learned from EPR fabrication oversight**
- **International cooperation : MDEP working group**
- **Bilateral cooperation : US NRC / ASN**

The French Nuclear Safety Authority (ASN)

- 1 EPR under construction
- Several replacement steam generators under construction
- 50 vendor inspections carried out by ASN in 2008

Component Manufacturing Inspection

3 types of inspections :

- Indirect inspections (inspections of licensee's surveillance of the vendor)
- QA audits
- Sample technical inspections

Lessons Learned from EPR Fabrication Oversight

1) Subcontractors should be carefully monitored by the vendor and the licensee
2) Schedule is more and more taken into account by vendors
3) Component manufacturing requires a high level of know-how

Lessons Learned from EPR Fabrication Oversight (Cont'd)

4) Vendor competence is shared with key subcontractors

5) The forging of big components is a key step in manufacturing

6) Regulator oversight is enhanced by sample technical inspections

International Cooperation: MDEP Working Group

Two objectives:

(1) improving the efficiency of vendor inspections

(2) taking into account vendor inspections performed by other regulators.

Accomplishments to date :

- regulatory practice comparison
- joint inspections

International Cooperation: MDEP Working Group (Cont'd)

Next steps :

- **Multinational QA audits**
- **Bilateral agreement on technical inspections**
- **Cooperation on long-lead-items oversight**

Bilateral Cooperation: US NRC / ASN

- **Close relationship between US NRC and ASN :**
  - **Several exchanges about EPR**
  - **Technical exchanges**
  - **Staff exchanges**

- **Several joint inspections performed in 2007 and 2008 and scheduled in 2009**

Bilateral Cooperation: US NRC / ASN (Cont'd)

Conclusion :

- Many similarities in vendor inspection practices
- inspection scope and frequency are different

Next steps :

- Common QA audits
- Use of each other's technical inspections

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

PERIODIC BRIEFING ON NEW REACTOR ISSUES

Bill Borchardt

Executive Director for Operations

June 3, 2009

Agenda

- New Reactor Program Status
- New Reactor Vendor Inspection Program

Overview of New Reactor Status

Michael R. Johnson, Director
Office of New Reactors

Status

- Conducting thorough and timely reviews of Design Certification, Combined License, and Early Site Permit (ESP) applications
- Significant progress on construction inspection program

Integrated Construction Inspection Program

- ESP inspections
- QA and Engineering inspections
- Vendor inspections
- ITAAC inspections
- Non-ITAAC inspections (programmatic)
- Assessment

New Reactor Component Fabrication and Oversight

Glenn M. Tracy, Director

Division of Construction Inspection and Operational Programs

Background

- Early identification of need to enhance vendor oversight
- SECY-07-0105
  - Broadening scope
  - Improving oversight of supplier audits
  - Additional inspection and related guidance

Current Program Overview

- Focus on assuring integrity of worldwide supply chain
- Targeted sample of routine and reactive vendor inspections (10/year)
- Oversight of third-party organization activities (e.g., NUPIC)

Current Program Overview (cont'd)

- Oversight of vendors is provided by:
  - Individual licensees
  - Industry third-party auditors
  - Consensus standards organizations
  - NRC vendor inspection program
- The ultimate responsibility lies with NRC licensees

Key Messages

- **Vendor Oversight has been enhanced**
- **Notable levels of international cooperation**
- **Lessons learned and international experience being incorporated**
- **Proactive approach has identified need for vigilance**

Presentation Topics

- Results of Vendor Inspections
- Counterfeit/Substandard Parts
- Lessons Learned
- Consensus Standards
- Current Topics/Future Initiatives
- Global Regulatory Cooperation

Topics

- **John A. Nakoski**

  Chief, Quality & Vendor Branch 2, NRO

  - **Vendor Issues**
  - **Counterfeit, Fraudulent, & Substandard Items**
  - **Lessons Learned**

Vendor Issues

- Commercial Grade Dedication
- Nonconformance and Corrective Action Programs
- Design Control
- Control of Measuring and Test Equipment

Vendor Issues (cont'd)

- 10 CFR Part 21 - Identification and Reporting of Defects and Failures to Comply
- Instructions, Procedures, and Drawings
- Control of Purchased Material, Equipment, and Services
- NRC Sponsored Vendor Workshops

Counterfeit, Fraudulent, and Substandard Items

- Inspection activities being refined
- Current and past operating experience
- Assessing industry ability to identify
- Hold licensees accountable

Counterfeit, Fraudulent, and Substandard Items (cont'd)

- Issued Information Notice 2008-04
- Developing internal community
- Interacting with broader Federal community
- Encouraging development of industry community

Lessons Learned

- Inspections enhanced by technical expert participation
- Timing of inspections is critical
- Program is strengthened by close ties with NRR and NMSS
- Globalization of supply chain creates additional challenges

Topics

- **Juan D. Peralta, Chief, Quality & Vendor Branch 2, NRO**
  - **Interaction and Relation of Consensus Standards to Vendor Oversight**
  - **Current Topics and Future Initiatives**
  - **Global Regulatory Cooperation in Vendor Oversight**

Consensus Standards and Vendor Oversight

- **Consensus standards process constitutes essential element of regulatory framework for consistent vendor oversight**

Consensus Standards and Vendor Oversight (Cont'd)

- American Society of Mechanical Engineers (ASME)
  - Active participation in Code Committees
  - NQA-1 (Quality Assurance)

Consensus Standards and Vendor Oversight (Cont'd)

- International Institute of Electrical and Electronics Engineers (IEEE)
  - Key standards governing digital I&C (software and hardware)
  - Active participation by staff in standards development committees and working groups

Current Topics and Future Initiatives

- Application and enforcement of NRC regulations in foreign countries
- Clarity of 10 CFR Part 21 requirements
- Vendor inspections and ITAAC

Global Regulatory Cooperation in Vendor Oversight

- Vendor Inspection Cooperation Working Group (VICWG)
- Significant bilateral and multilateral cooperative efforts
- International vendor oversight practices

Summary

- Rigorous vendor oversight is crucial to maintaining the integrity of the global supply chain and new reactor safety
- We must have strong independent regulatory oversight
- There is no substitute for effective licensee oversight

ACRONYMS

- ASN – Autorité de Sûreté Nucléairé
- I&C – Instrumentation and Control
- ITAAC – Inspections, Tests, Analyses, and Acceptance Criteria
- NMSS – Office of Nuclear Material Safety and Safeguards
- NQA – Nuclear Quality Assurance
- NRO – Office of New Reactors
- NRR – Office of Nuclear Reactor Regulation
- NUPIC – Nuclear Procurement Issues Committee
- QA – Quality Assurance

Industry Panel

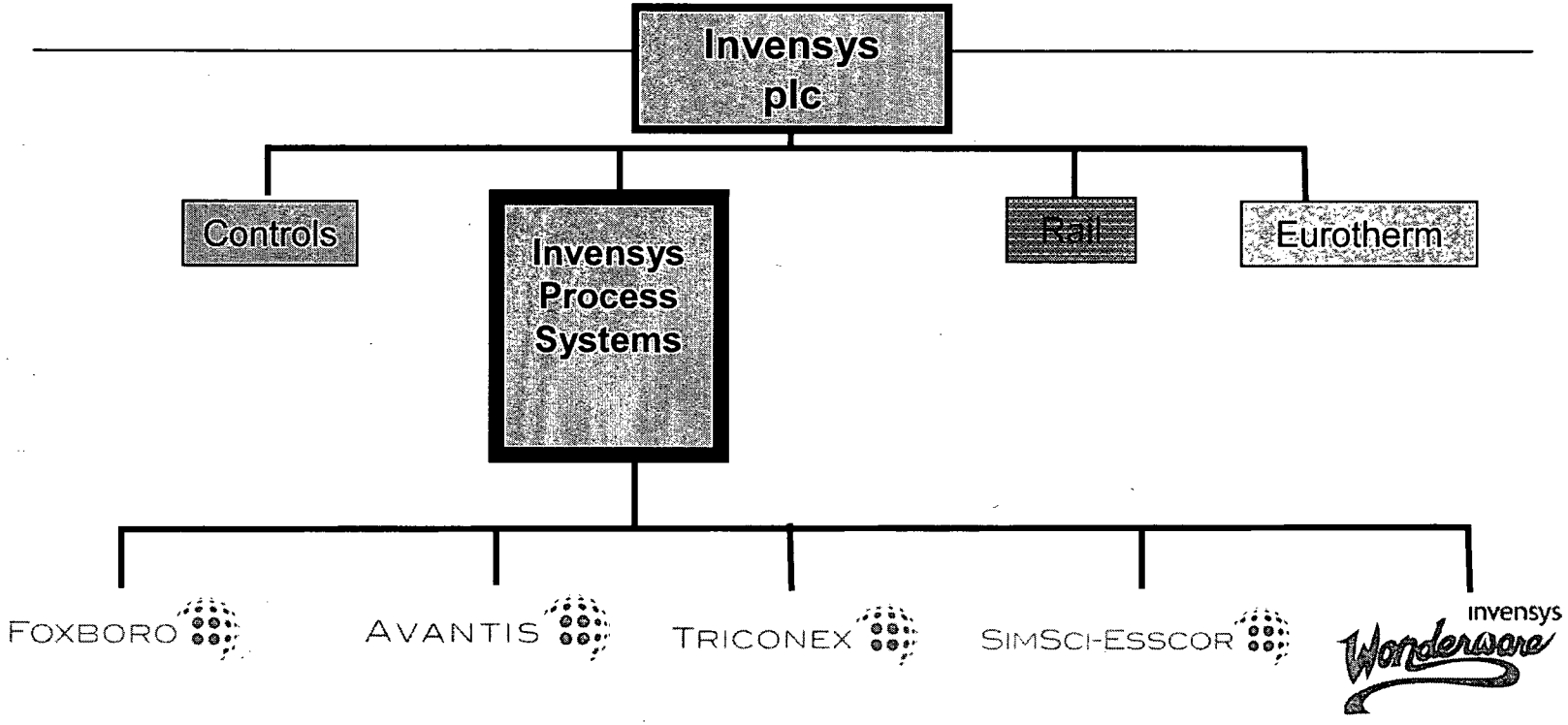
New Reactor Component Fabrication and Oversight

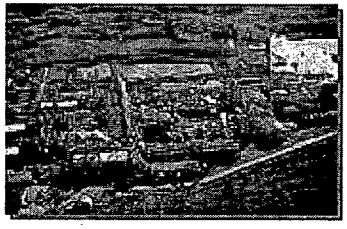
June 3, 2009

Jeff Larson

Director, Nuclear Quality Assurance

Invensys Process Systems Brands

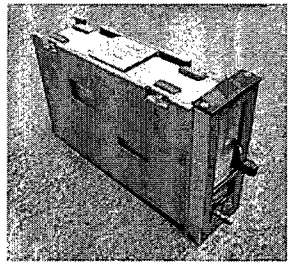




IPS
INVENSYS PROCESS SYSTEMS

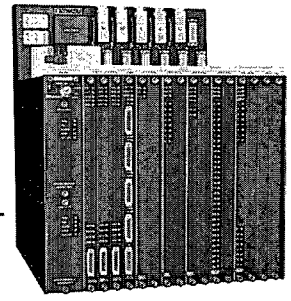
A Revolution in Performance

Foxboro



- Supplying control equipment to the nuclear industry since the early commercial reactor at Shippingport, PA.
  - Nuclear experience spans over 40 years
  - Global scope
- Spec 200 products introduced in 1972 and were nuclear qualified in 1977.
  - Installed in over 130 nuclear plants; still manufactured and supported
- I/A Series products introduced in 1987
  - IPS solution for Balance Of Plant and non-safety nuclear control applications.
  - Continuous current life cycle philosophy with migration path

Triconex



- A Commercial Off The Shelf (COTS) triple modular redundant Programmable Logic Controller (PLC) built from the ground up as a safety system
- Generic SER received from the NRC in December 2001 - Version 9.5.3
- Qualification testing on Tricon Version 10.2.1 completed in 2007
- SER update process initiated

Nuclear Program Specifics

- Although originally COTS products, the qualified design is maintained under our 10CFR50 Appendix B QA Program
- Commercial Grade Dedication process in accordance with 10CFR21 and EPRI NP-5652 as endorsed by NRC
- Primary equipment manufacturing is performed at an IPS facility
  - Direct access to design and testing requirements
  - Subject to annual internal audits or Commercial Grade Dedication Surveys
- Hardware and pre-developed software is provided for system design & integration as a Basic Component
- System design, integration and testing under our Nuclear QA Program

Commercial Grade Procurement & Dedication

- Defined and controlled Commercial Grade Dedication process
  - Product design control
  - Determination of safety function
  - Identified and linked critical characteristics
  - Use of recognized acceptance methods
- Establishment and maintenance of dedication records
  - Technical evaluations
  - Acceptance tests & inspections
  - Supplier controls
- Implementation of 10CFR21 evaluation and reporting requirements

Counterfeit or Fraudulent Material Prevention

- Addressed through IPS Corporate Supply Chain policy
- Controls in procurement and receipt inspection procedures
  - Graded approach based on material source
  - Inspection of physical condition, packaging, markings
  - May include sample testing or verification

Program Oversight & Assessment

- IPS internal audit process
- Multi-location NUPIC audits
- Individual nuclear customer audits
- NRC Inspection – May 2008

Challenges for Effective Procurement Control in New Reactor Construction

June 3, 2009

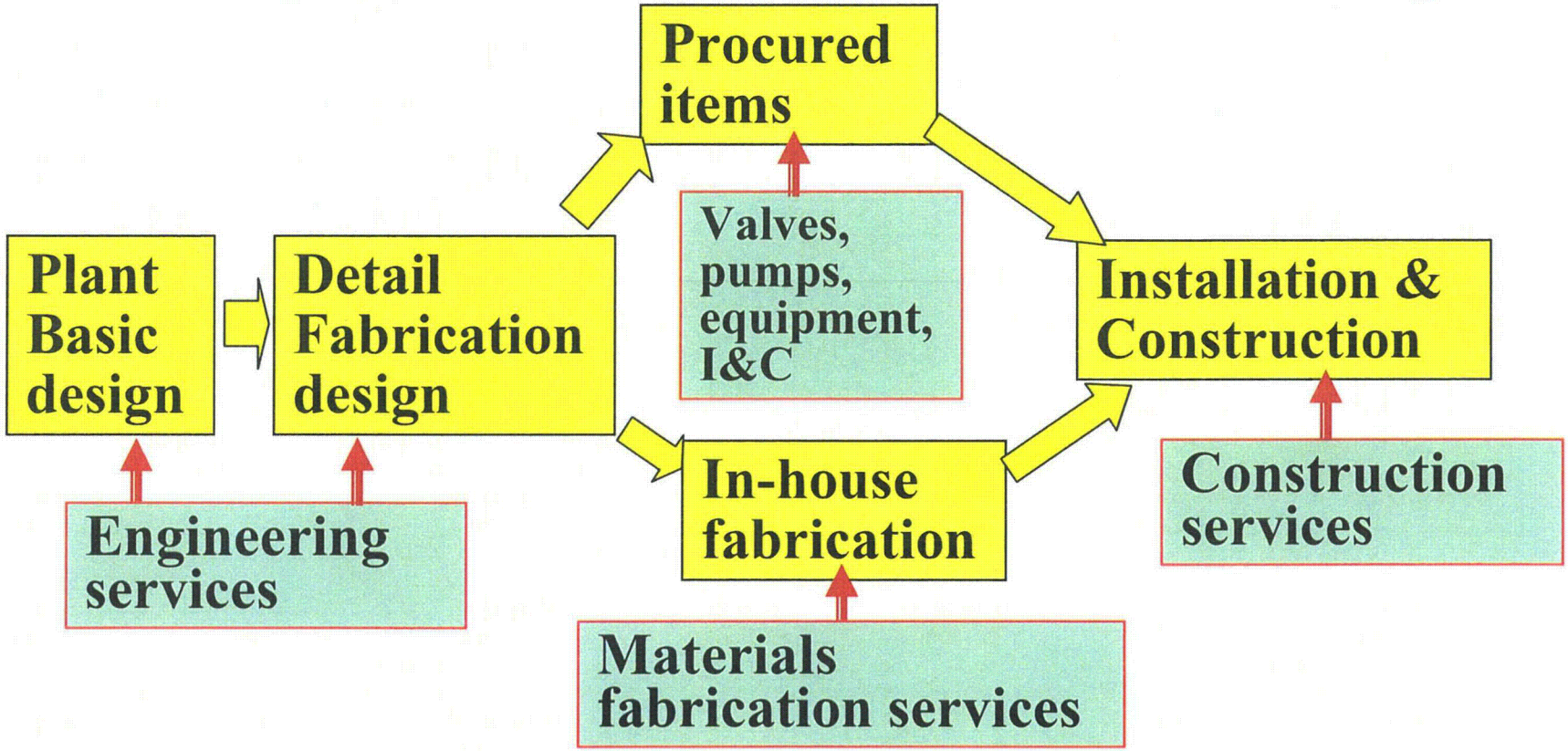
Naoki Miyakoshi, General Manager

Nuclear Quality and Safety Management Department
Nuclear Energy Systems
Mitsubishi Heavy Industries, ltd.

Today's Presentation

- As a design and construction company, Mitsubishi is dependent on the supplier at every stage.
- We built the first new reactor in Japan in the last 10 years.
- Today I will describe our activities to achieve procurement quality and the lessons learned from our efforts.

Quality of Procurement Determines Plant Quality



Overview for the supplier

- As nuclear business declined, many suppliers were also declined.
  - Key managers and staff have departed
  - Structural and functional change
- Impact of ISO 9001
  - Effective concepts: management, process-oriented, Resource control
  - Overestimated the ability of ISO 9001 compliance to maintain supplier's nuclear QA capability.

Situation in 2004

- In building the first reactor in 10 years, construction failure was unacceptable
- We qualified and maintained our suppliers by QA audits, but ----- we were anxious about supplier's true performance

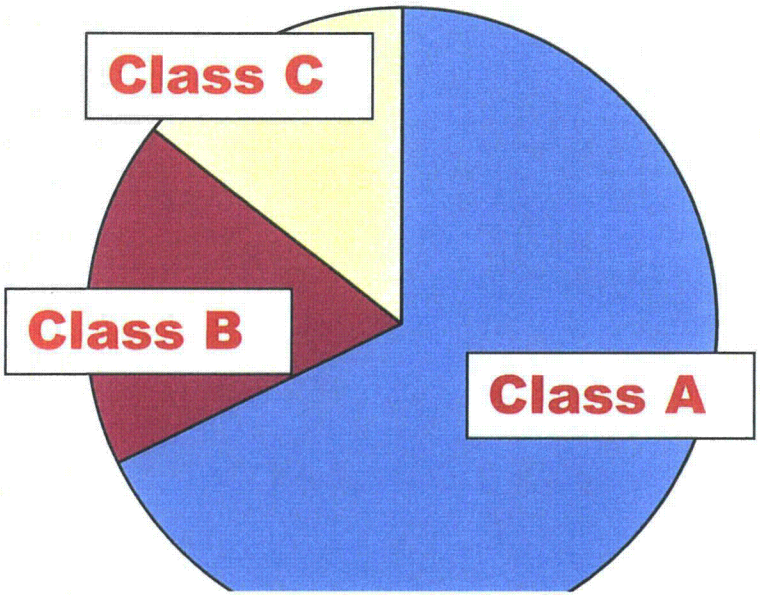
  Issue: Can our procurement control system prevent the use of improper material in a procured component?

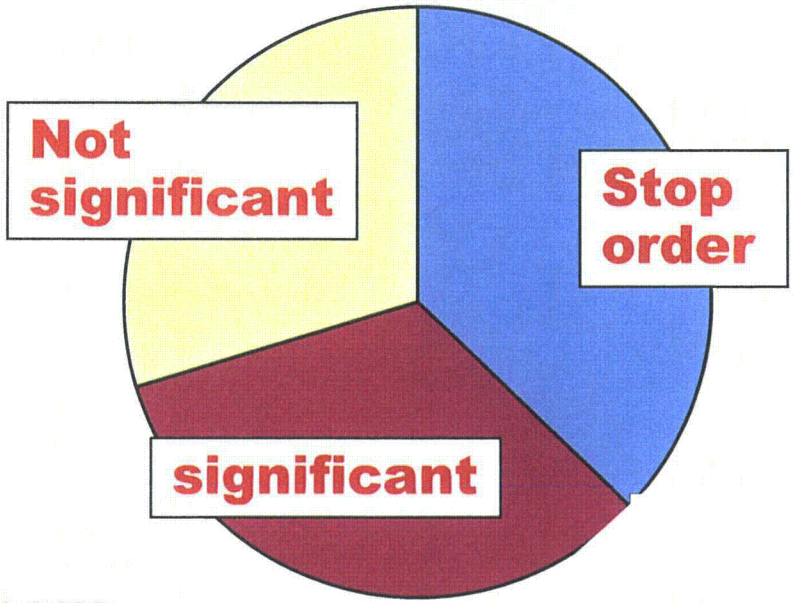
Special Investigation

- Investigation scope
  - 254 companies, 680 products
- Viewpoints
  - traditional QA aspect
  - business condition
  - posture of management
  - facility deterioration
  - personnel capability
  - procured item
  - others

Investigation Results

118 companies had problems qualifying as suppliers





Quality Classification in Japan:
Safety-related ≦ Class A

Investigation results

Identified Problems

- Business aspect
  - Top management policy
  - Excessive orders
  - Spare parts production
- Technical aspect
  - Insufficient knowledge transfer
  - No key-people
  - Deterioration of facilities
- Quality aspect
  - Poor quality attitude of management
  - Ineffective corrective action

Lessons Learned

- Management participation (QMS)
- Personnel capability
- Process-oriented
- Design quality assurance

- Safety Culture, Safety Mind
- Communication & Accountability
- Partnership with supplier

Challenges for Future Reactor Construction

Upgrade the supply-chain for US-APWR

- Incorporate US requirements
- Apply construction experience

- Qualification of US vendors
- Standardization of Specification reflecting supplier's pre-review
- Graded QA requirements
- Vendor Oversight Program

Challenges for Future Reactor Construction

Establish new supplier requirements

- Acceptability of new integrated QA requirements for globalism
- Effective graded approach
- Discussion of QA requirements for lower-tier subcontractor
- Importance of QMS concepts
- Expansion of commercial grade items

VALUE CREATION THROUGH WORLD CLASS QUALITY AND CONTINUOUS IMPROVEMENT

June 3, 2009

John J. Lanzoni, VP Supply Chain-NPP, Westinghouse

OMA - The Burning Platform

- **The current business environment presents significant challenges**

  – Our customers expect flawless performance

  – Industry expectations and regulations are different from what they were in the past –

    our culture must be prevention oriented

  – We have secured substantial backlog

OMA - The Burning Platform, con't.

- **The current business environment presents significant challenges, con't**
  - Forecast for future growth is high
  - The combination of new business, support to Toshiba and introduction of new employees present complex challenges
- **The status quo will result in the inability to meet increasing industry and customer expectations**

Quality and Continuous Improvement Core Process Redesign – Ideal future state is now

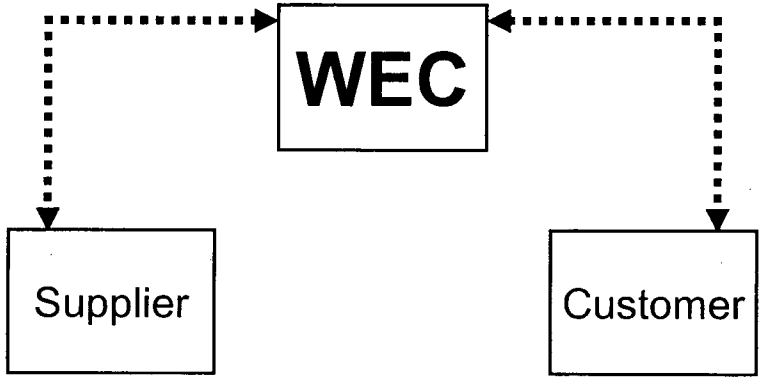
Our quality culture must go beyond compliance –

it must include a tight linkage with proactive continuous improvement and organizational learning; and include our employees proactively partnering with customers and suppliers to drive performance improvement!

Compliance + Continuous Improvement = World Class Performance

Implement a WEC wide supplier quality performance and engineering process – Work with exceptional suppliers

- Proactively partner with suppliers to foster continuous improvement culture - share learning, share benefits



Proactive relationship with suppliers

Supplier goods/services to WEC

Flawless delivery to Customer

Continuous Improvement

WEC = Westinghouse

Implement a WEC wide supplier quality performance and engineering process – Work with exceptional suppliers, con't.

- Elevate supplier quality oversight/QC/In-process surveillances
- Enhance and standardize audit processes and frequency to go beyond compliance – incorporate Safety, HuP, and Continuous Improvement
- Collaborate with SCM across the business units to create one process to clarify roles, eliminate duplicate efforts, save costs; and create shared metrics to drive early problem resolutions
- identification and provide value added

Quality Is Every Ones Job

As employees of a proactive, global learning organization, we will be empowered to:

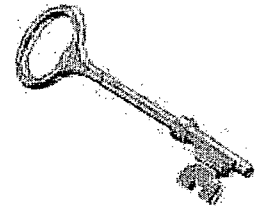
- Share learning across organizational boundaries by actively seeking out and applying best practices and lessons learned
- Utilize CAPs and other sources of learning to identify trends before they become issues; and turn them into opportunities for improvement

Quality Is Every Ones Job, con't.

As employees of a proactive, global learning organization, we will be empowered to:

- Engage in and promote Human Performance tool usage and projects
- Support Continuous Improvement at all levels
- Become advocates for corporate standardization
- Proactively engage with suppliers to foster their continuous improvement

Key is Continuous Improvement



- Implement WEC wide supplier quality performance and engineering process
- Implement WEC wide Organizational Learning Model (CAPA, L/L)
- Institute a staff development model for Quality professionals
- Continue to drive standardization and consolidation in procedures

Component Fabrication and Oversight

June 3, 2009

Carol L. Berrigan
Sr. Director, Industry Infrastructure
Nuclear Energy Institute

NEI

Not a New Issue

- Current experience
  - Browns Ferry, Watts Bar, outages
- Global experience
- Industry planning for new plants

Current Plants

- NRC approved Quality Assurance Program Description
- Clear contractual language to specify Parts, Materials, and Services (PMS).
- Surveillance performed during manufacture
- NUPIC audits of vendors

NEI

Current Plants (cont.)

- Based on safety significance, receipt inspection may include:
  - Laboratory testing of material
  - Detailed verification of documents and shipping materials
- Installation by quality technicians or craftsmen
- Testing of components after assembly
- Sharing of operating information across the industry

NEI

New Nuclear Enhancements

- Improved NUPIC audit checklist to focus on fraudulent PMS
- Trained NUPIC auditors on improved checklist and how to identify fraudulent efforts
- Improved awareness of vendors
- Increased/enhanced surveillance being performed at vendor shops.

Expanding the Supply Chain

- Key challenges
  - Increasing domestic capacity
  - Outreach to potential suppliers
  - Expanding domestic supplier access to foreign markets

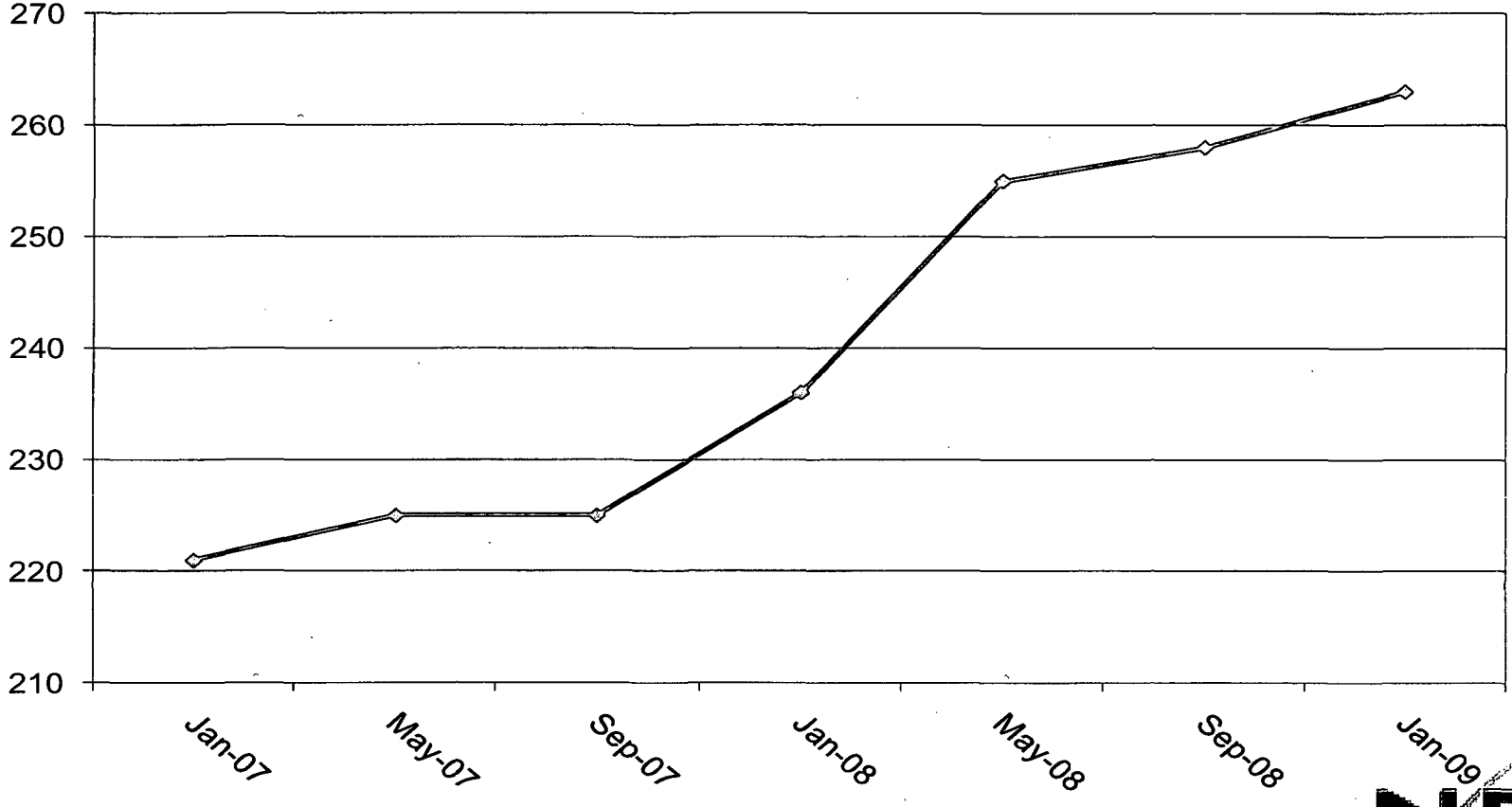
Manufacturing Outreach Workshops

- Three events in 2008
  - Nearly 900 participated from 440 companies
- Four events in 2009
  - 450 participated in Chattanooga
  - Event tomorrow in Detroit
  - New quality workshops
- Other outreach

Educating Potential Vendors

- Nuclear quality expectations
  - 3-hour workshop session (Commercial nuclear requirements)
  - 4-hour training (NQA-1 and DOE requirements)
  - NSSS and EPC vendor qualification programs

Increases in U.S. Nuclear Certifications



Source: ASME Nuclear Subcommittee on Accreditation, February 2009