Nuclear Power

Updates on Quality Management

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NPPC Mission

To initiate, develop, and communicate improvements to the body of knowledge and tools applicable to quality management and quality engineering, and to promote the use of the knowledge and tools as applicable to nuclear power production.
Objectives

• Illustrate “Big Picture” Quality Management programs and initiatives
  – NRC (Nuclear Regulatory Commission)
  – INPO (Institute of Nuclear Power Operations)
  – NEI (Nuclear Energy Institute)

• Take-homes
  – Concepts are applicable to your business
  – How you can get nuclear plant performance information
  – How you can get educated or educate others on nuclear power (plant operation, spent fuel storage, fuel shipping, Yucca Mountain, etc.)
  – Self-reflection on personal improvement planning
NRC

Role: Maintain Regulation, issue licenses for operation of nuclear facilities, control of materials, etc.

- Performance Measures for plant operators
  - Creation further development of set of measures to monitor regulatory performance
    - Focused solely on safety of operations
    - Primarily measures outcomes, “leading” measures are very limited (appropriate for a regulator)

- Significance Determination Process
  - Probabilistic Risk Assessment used to assess violations. What risk was presented by the condition?

See www.nrc.gov - very open information on these processes, and performance information on reactor operation
INPO
“Sharing Information for Excellence in Safety and Performance”

• Provides compilation of best practices (reports, workshops) – focus is on safety, not economics
• Provides performance assessment services (ad hoc, and mandatory two year cycle)
• Undergoing significant transformation in attempt to better identify leading aspects of performance
INPO’s Revised Performance Improvement System

- Corrective action
- Self assessment
- Benchmarking
- Operating experience
- Training
- Management & leadership development
- Human performance

INPO is significantly challenging itself in attempting to perform more meaningful assessment
NEI

Purpose: To foster and encourage the continued safe utilization and development of nuclear energy to meet the nation’s energy, environmental and economic goals

• Policy direction
• Unified approach to regulatory issues, reliability and economic efficiency
• Encouragement to educational institutions to promote education in nuclear energy disciplines

Industry Executives have challenged NEI to improve efficiency, coordination and shift some resources to most important issues

– Development of Standard Nuclear Performance Model (SNPM) for more effective process management

See www.nei.org for more information
Good Job but More Work Ahead

Based on UDI & NUS Data plus info. from ERIN Eng & EPRI
NEI Performance Improvement

• The objective of performance improvement is to continuously explore ways to:
  – Increase business efficiency
  – Lower operating cost
  – Maintain or improve safety

• This is accomplished by:
  – Focusing on process management
  – Maintaining a Standard Nuclear Performance Model
  – Conducting benchmarking training
  – Understanding Change Management
  – Developing and Maintaining “Communities of Practice” in each process area
Vision: Process-Based Perspective of Site

Core Production Processes

- Employee Selection
- Management Reporting
- Training & Development
- Planning
- Objectives & Goals
- Budgeting
- Communication
- Performance Management
- Recognition & Rewards
- Customers
  - Asset Owner
  - Local Community

View the site as a business enterprise
Hastings Basketball Boosters Program

Key Core and Support Processes

Spiral Tournament Planning

Program Objectives & Goals

Communication & Publicity

Finance & Budgeting

Tournament Scheduling

Tryouts & Team Selection

Coaching Selection, & Development

Traveling and In-House Program Management and Improvement

Volunteer Coordination

Core Processes: Practice and Tournament Play

Community Outcomes

- Youth Players
- Parent Support
- HS Program Success
Value of a Process Framework

– Emphasis on Process, not Departments or specific persons
  • Break down silos, no personal attack
– Common “Mental Model” of the overall system, leading to:
  • More effective Management
  • More effective Assessment
  • Consistency
    – Stable foundation to build upon and improve
    – Alignment; Speak the same language
Value for Nuclear Power Industry

– Integrate and leverage resources of NEI, INPO, EPRI and others
  • “Where will performance improve if I use the results of this report?”
  • “Where will project proposed improve performance, and how will it be measured?”

– Strategic “Map” to engage with the industry in key processes (learn as well as contribute)
  • Job responsibility to engage with Community of Practice
NEI Business Approach to Process Management

• Define processes and practices
• Establish business performance measures
• Monitor against the performance measures
• Establish an integrated approach
  – For assessing performance
  – Work force & operational feedback
• Take corrective action & adjust the process
• Communicate
  – Internal department, site, company
  – External industry groups (Communities of Practice)
STANDARD NUCLEAR PERFORMANCE MODEL (SNPM) - AN EXECUTIVE VIEW

MANAGEMENT PROCESSES

- Leadership
  - Vision/Business Objectives
  - Management Structure
- Business Services
  - SS002 Strategy/Budget/Plan/Implement
- SS004 Human Resources
  - Culture / People
- SS001 Information Technology
  - SS003 Information Management

CORE BUSINESS OPERATIONAL PROCESSES

- CM001-004 Configuration Management
- MS001-008 Materials and Services
- WM001-009 Work Management
- Equipment Reliability ER001-004
- OP001-003 Operate Plant
- SS005, SS006, SS007 Support Services
- T001-003 Training
- Nuclear Fuel
- LP001 and LP003-006 Loss Prevention

ENABLING PROCESSES

- SS002 Cost/Budget
- LP002 Performance Improvement
- Feedback Loop

COMPETITIVE ENVIRONMENT AND STAKEHOLDERS

- Electricity Production

Cost/Performance
SNPM provides industry a picture of site business enterprise
Engage with Industry learning via SNPM Community of Practices

A Community of Practice (CoP) is an industry peer group of experts in a business process or sub-process defined in NEI's Standard Nuclear Performance Model (SNPM). The group serves as the “owner” of a particular process or sub-process, managing the solution of business process issues for the industry in that area. A CoP, then, is a more formal and comprehensive group than a Special Issue Group (SIG), scores of which have formed over the years within the nuclear industry. CoPs are led by a steering team and governed by a formal charter to implement the functions below. SIGs are peer groups of experts in a technical area who meet to share knowledge and experience.
Communities of Practice

• Objective
  – Improve communication and awareness of potential issues/problems & facilitate exchange of information
  – Assess performance & develop proposals for improvement
  – Coordinate & consolidate Special Issue Groups (SIG)
    • Eliminate duplicative activities
    • Supply Chain SIGs reduced from 13 to 5
• Add business & performance element to an existing industry group/forum, where possible
• Participate in the development of industry Standards
Communities of Practice

**Established CoPs**
- Configuration Management
- Materials and Services (Supply Chain)
- Information Technology
- Information Management
- Human Resources
- Equipment Reliability

**CoP Discussions**
- Emergency Preparedness
- Fire Protection
- HP-Radiation Protection
- Licensing & Permits
- Work Management
- **Performance Monitoring and Improvement** (LP002)
Community of Practice

Communicate Information
Identify & Coordinate
Resolution of Issues
Coordinate Improvement Activities
Update of Process Descriptions & Business Performance indicators

Suppliers/Vendors
NSSS OGs
SIG
SIG
SIG
INPO
EPRI
Utilities
Other COPs
NEI
NEI’s View of Organizational Effectiveness

- Located predominantly in Loss Prevention process
  - Performance Monitoring and Improvement
- INPO AP-903 addressed corrective action prior to INPO SA and CAP Guideline
- Individual process maps developed in conjunction with each report:
  - Self Assessment
  - Trending
  - Corrective Action
  - Human Performance
- Several companies identified benefit in integrating these areas onto one system of processes – some call it “organizational effectiveness”
- Some now integrate these activities in a single group
NMC’s Performance Monitoring and Improvement

Site Business Enterprise

Site Performance Status

Verify Effectiveness of Actions

Management Action Program

Continuous Performance Monitoring

Strategic Improvement Planning Cycle

BENCHMARKING

Ad Hoc Issue Identification

Business Plan

Processes support the Business Cycle
• Corrective Action (including External Operating Experience assessment and action tracking)
• Performance Indicators/Trending
• Assessment (Nuclear Oversight, and structured self-evaluation)
• Site Performance Status reports

Human Performance (Leader/Management)
Big Picture

Business Case
“Why”

Tools & Techniques
“How”

Specific
Improvements
(measured)

- Effective Human Motivation
- Cost
- Quality
- Performance
- Consistency
- Production Capacity

Business/Tactical Planning

- Standard Processes
- Process Maps
- High Level KPIs
- Flexible Organization Design
- Benchmarking Projects
- Good Practices

Integrating Framework

- Process Improvement
- Training- Lean Tools
- Change Management
- Human Motivation
- Management Tools
- Integration

Project Management
Spectrum of Performance

Management Vision & Strategy
Nuclear Generation will remain a long-term reliable provider of electricity at a competitive price

NRC - Focused on Safety of Operations

Process Management
Set Performance Goals. Use measures to assess whether performance is meeting goals. Use information to improve process.

Culture of Learning/Improvement
Management and personnel skills and attitudes support conservative decision-making and performance assessment. Culture makes data-based decisions and uses process management for continuous improvement.

Adapted from: EED-99-01 Recommendations for the Implementation of Selected Leading Indicators of Performance at Nuclear Power Production Plants, ASQ, 1999
Traditional NPPC projects are being rapidly “taken over” – this is a good thing!

• Management is taking over responsibility for Quality functions and systems
• Beginnings of INPO and EPRI alignment around NEI SNPM
  – Used as planning framework for joint EPRI, INPO, and NEI meeting

Where can ASQ help? Emphasize quality concepts in CoPs
  – the NPPC Mission still applies
    • Quality Management Division
    • Statistics Division

NPPC – Where to go?
Business Systems Thinking: 
Next Step for Performance Assessment

Where does your organization do most of its performance evaluation?

What are capabilities of the assessment staff to engage with management and leadership systems?

Adapted from One More Time: Preventing Managerial Failure Among Engineers and Scientists  Van Nostrand Reinhold
Baldrige National Quality Program - 2003

ORGANIZATIONAL PROFILE:
ENVIRONMENT, RELATIONSHIPS, and CHALLENGES

1. Leadership
2. Strategic Planning
3. Customer & Market Focus
4. Measurement, Analysis, and Knowledge Management
5. Human Resource Focus
6. Process Management
7. Business Results
1. Malcolm Baldrige
2. ISO 9000
3. 6 Sigma
4. CMM
5. Lean Mfr
6. Bal Score Card
7. Bus Proc Re-eng

1. Leadership
   • Leadership
   • M/V/V (aspirations)
   • Operating Principles
   • Governance
   • Operational Reviews
   • Social Responsibility

2. Strategic Planning
   • Strategic Plans/Goals
   • Operational Plans/Goals
   • Financial Goals
   • Technology Needs
   • Initiatives/Supporting Actions
   • Differentiation/Competitive Advantages

3. Customer & Market Focus
   • Market Knowledge
   • Customer Requirements & Segmentation
   • Relationship Management
   • Customer Support

4. Measurement, Analysis, and Knowledge Management
   • Performance Measurement
   • Performance Analysis
   • Data and Information Availability
   • Organizational Knowledge

5. Human Resource Focus
   • Work Structures
   • Performance Management System
   • Training
   • EE Development
   • EE Environment & Services
   • EE Satisfaction

6. Process Management
   • Value Creation Processes
   • Support Processes

7. Business Results
   • Customer-Focused
   • Product and Service
   • Financial and Market
   • Human Resource
   • Organizational Effectiveness
   • Governance and Social Responsibility
Personal Improvement

What is your personal plan to increase your net worth to yourself and your organization?

• Business Systems Education
• Quality Award Evaluator (www.nist.gov)
  – State Award evaluator
  – Baldrige evaluator
• American Society of Quality
  – Certified Quality Manager, others
  – Other Divisions
    • Management
    • Statistics