



American Society for Quality

**ENERGY AND ENVIRONMENTAL DIVISION**



# Nuclear Power

## Updates on Quality Management

**Jim Hill**

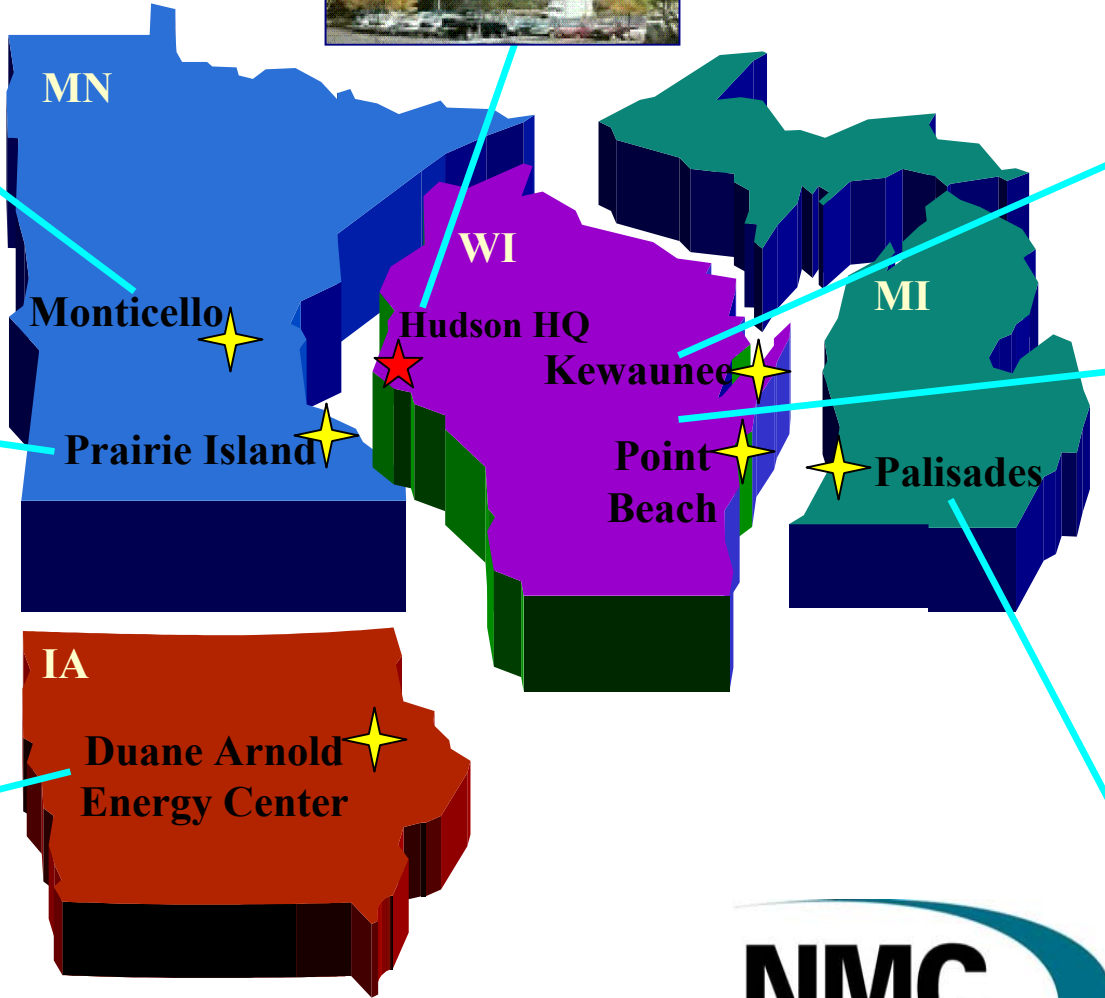
**ASQ Nuclear Power Production Committee**

**NEI SNPM Working Group**

**Director, NMC Performance Assessment**

**NMC**

*Committed to Nuclear Excellence*



**NMIC**

*Committed to Nuclear Excellence*



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# Nuclear Power Production Committee

## **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](http://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**

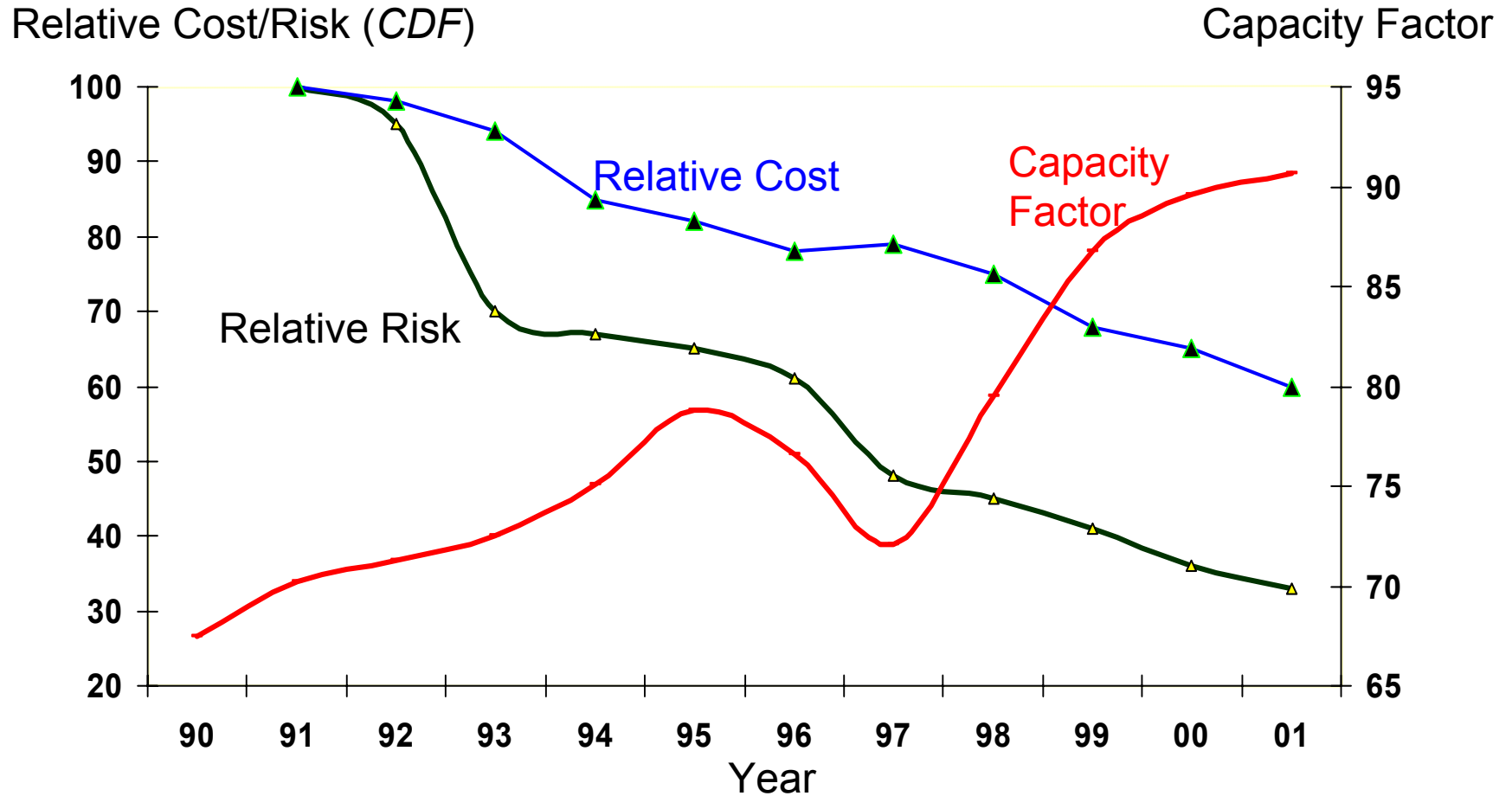
**Industry Executives have challenged NEI to improve efficiency, coordination and shift some resources to most important issues**

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

See [www.nei.org](http://www.nei.org) for more information



# Good Job but More Work Ahead

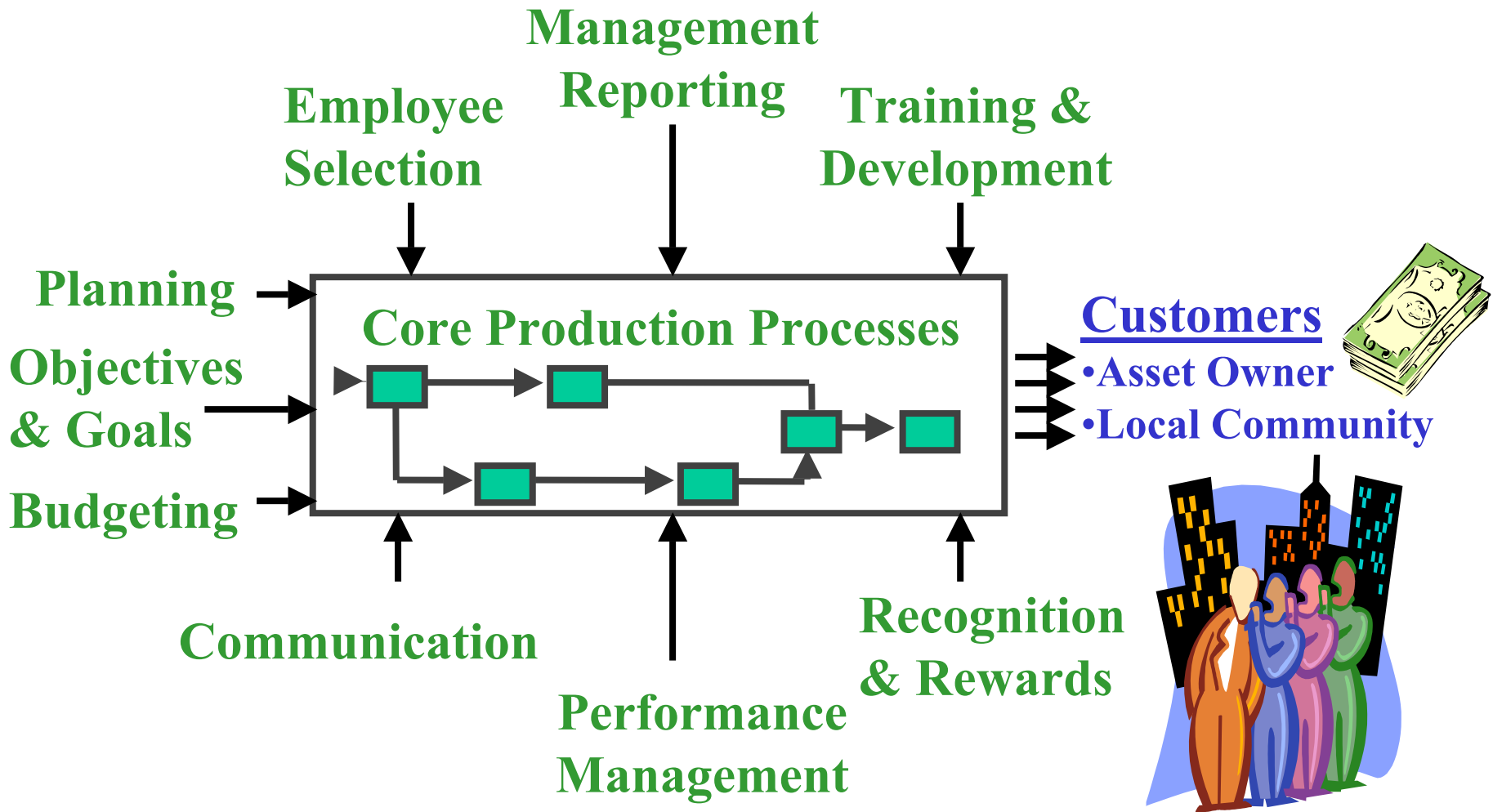


Based on UDI & NUS Data plus info. from ERIN Eng & EPRI

# 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

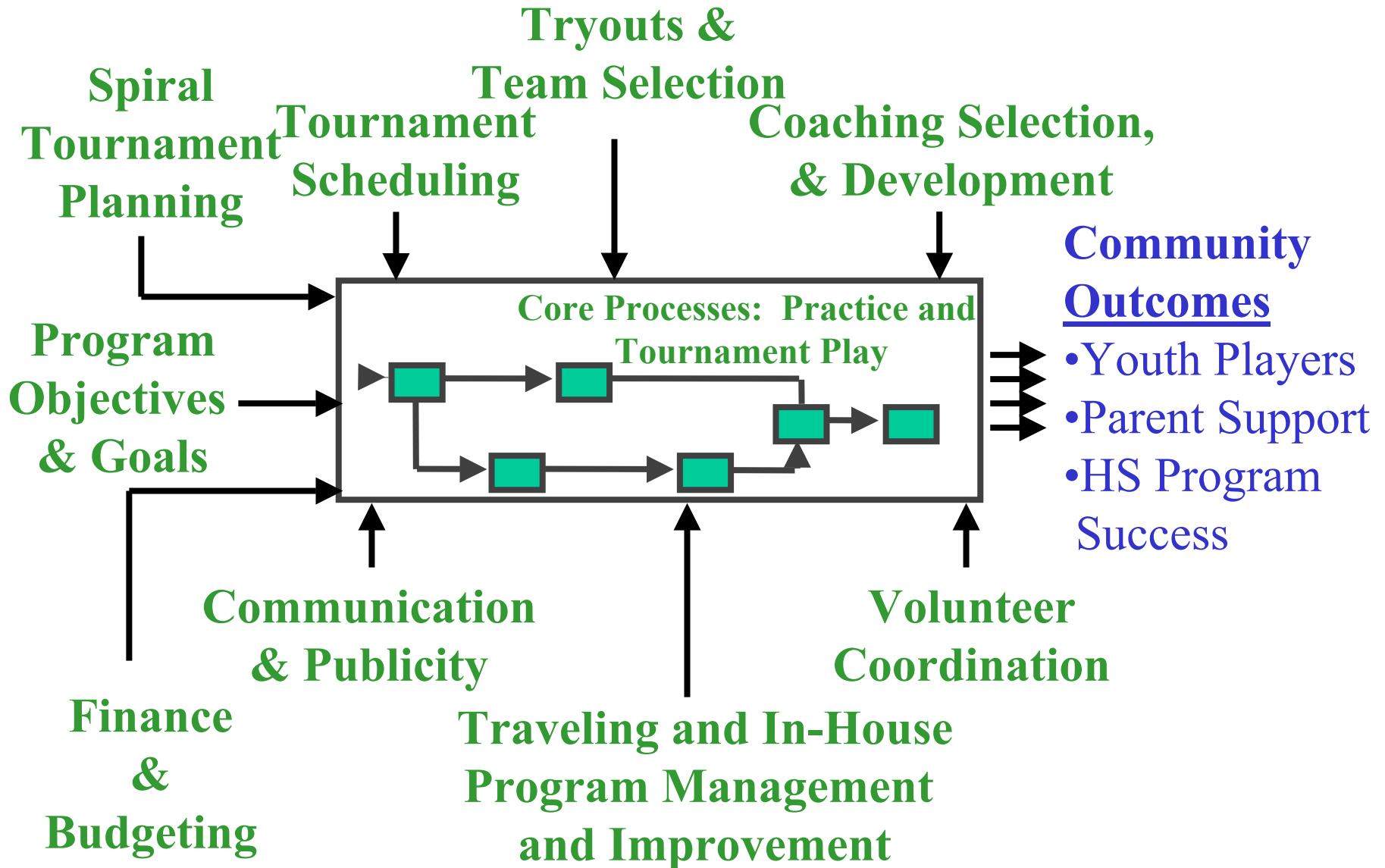
# Vision: Process-Based Perspective of Site



**View the site as a business enterprise**

# Hastings Basketball Boosters Program

## Key Core and Support Processes



# 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

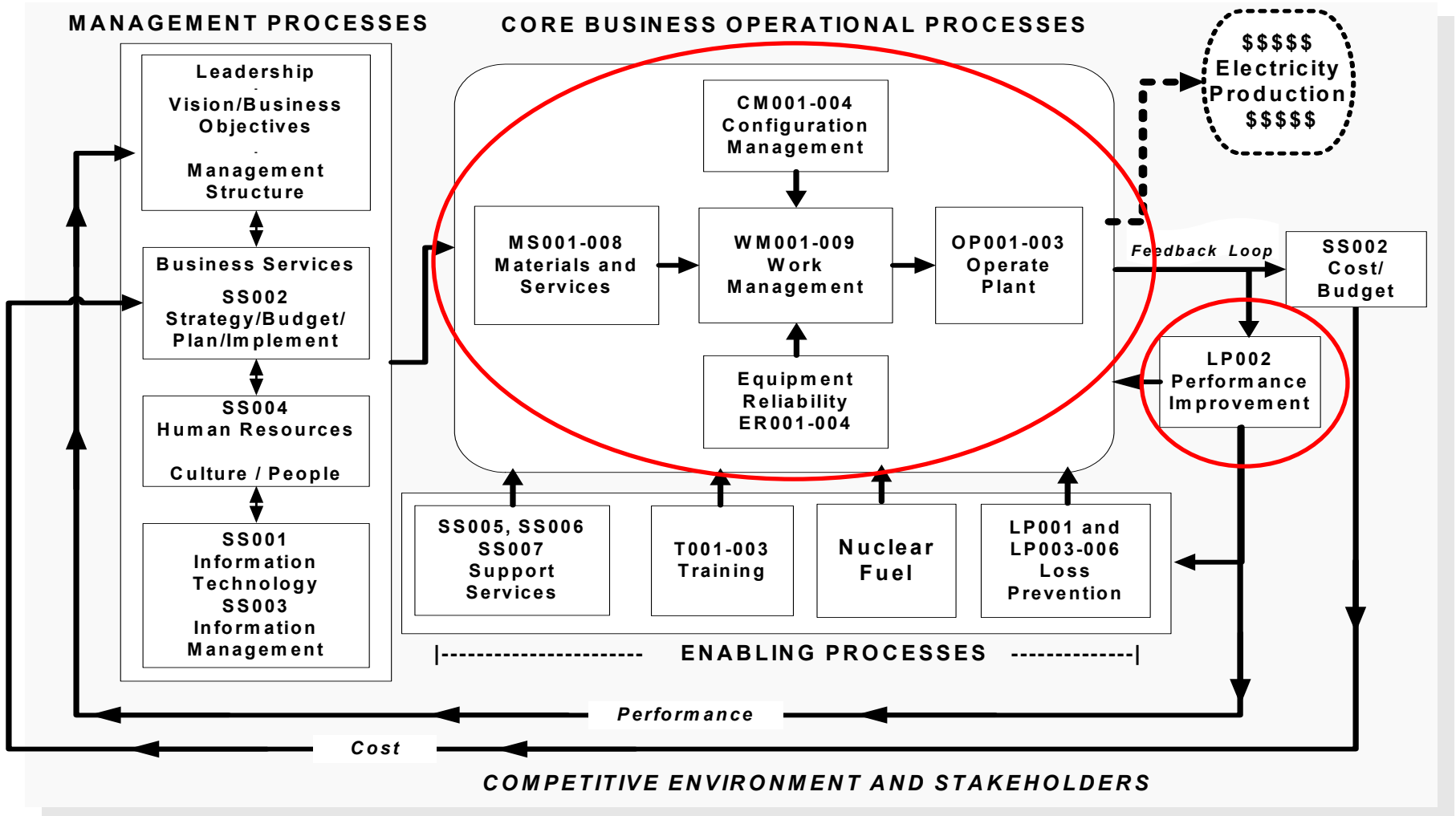
# Value for Nuclear Power Industry

- 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

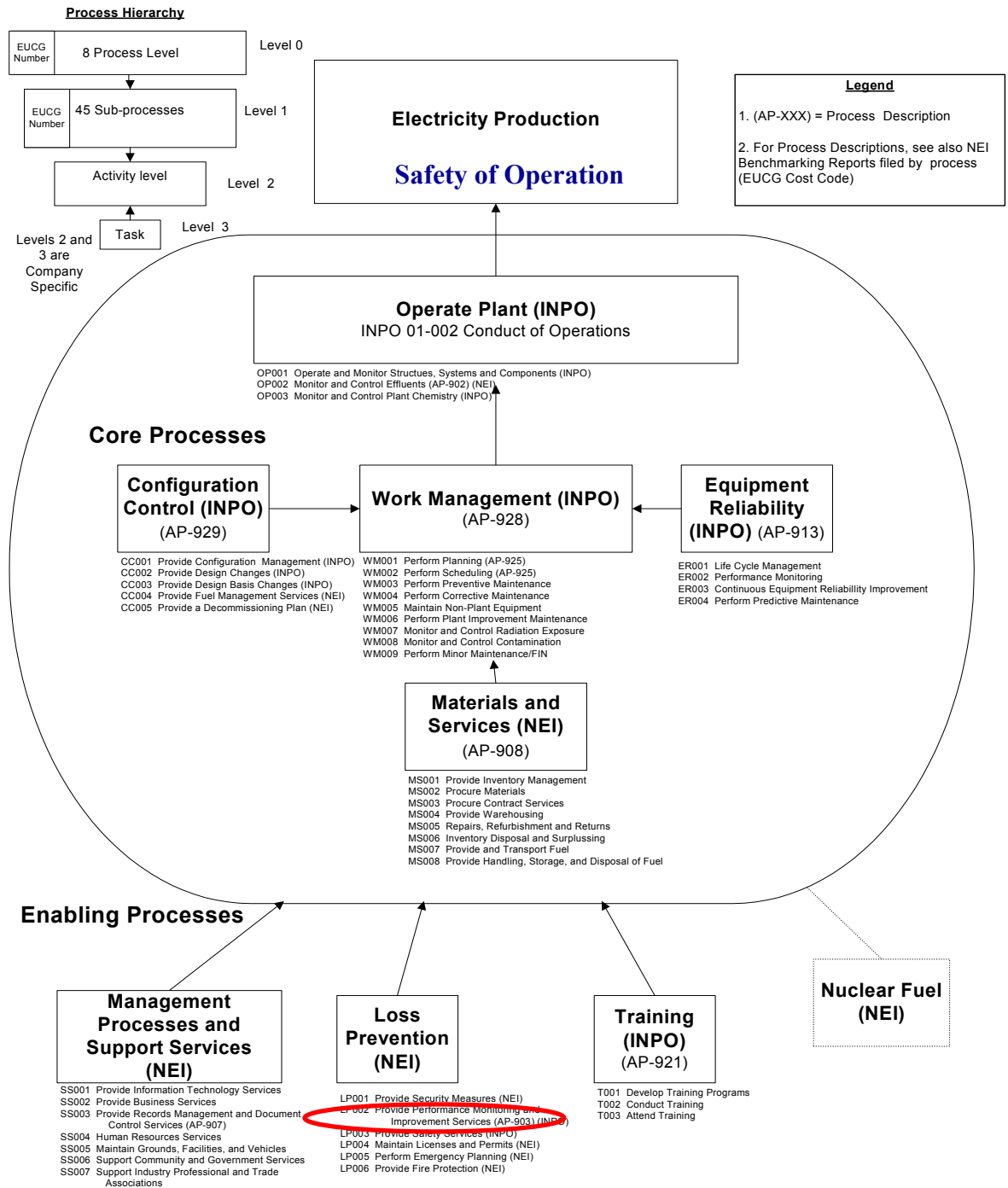
- Define processes and practices
- Establish business performance measures
- Monitor against the performance measures
- Establish an integrated approach
  - For assessing performance
  - Work force & operational feedback
- Take corrective action & adjust the process
- Communicate
  - Internal department,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

# STANDARD NUCLEAR PERFORMANCE MODEL (SNPM) - AN EXECUTIVE VIEW





# 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

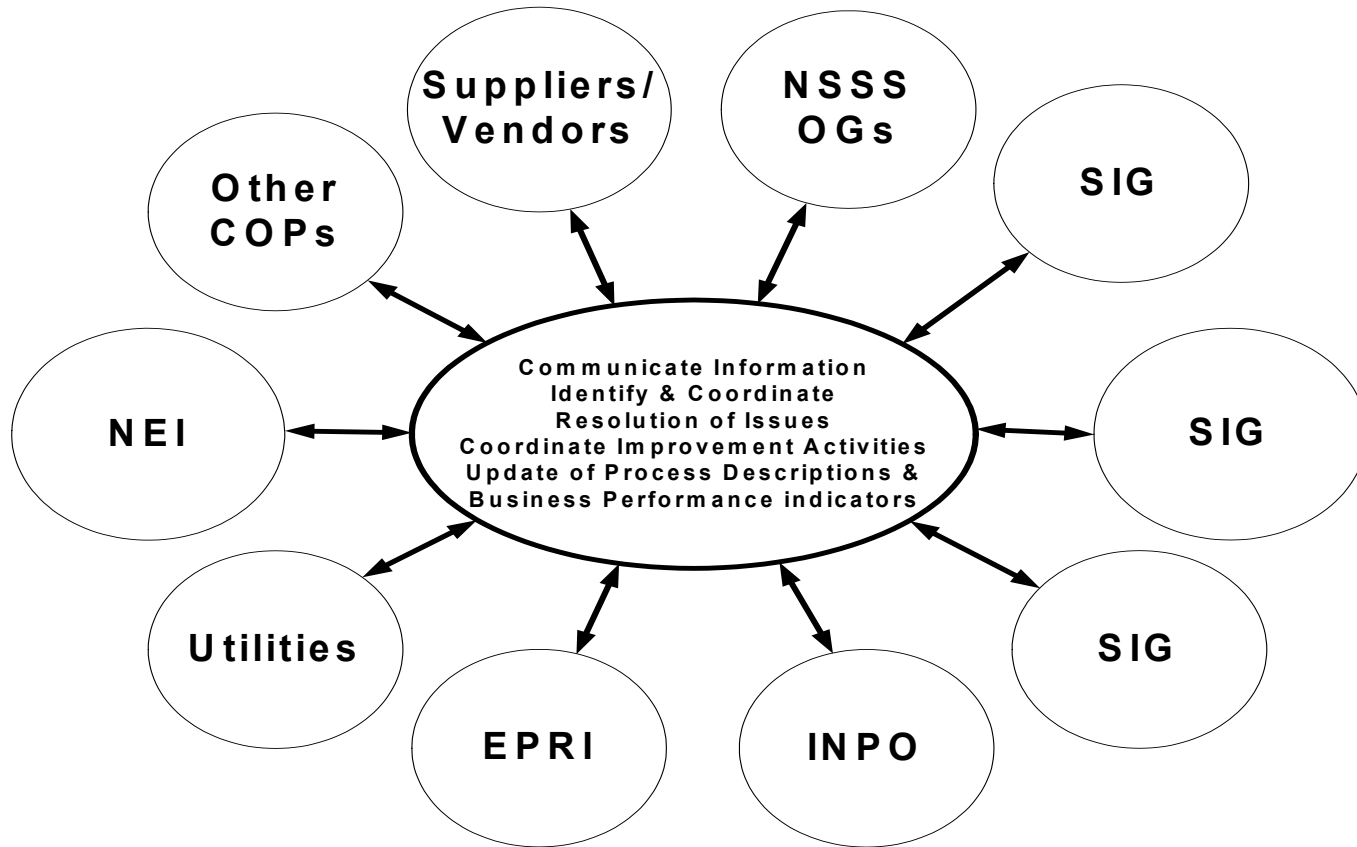
## Established CoPs

- 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

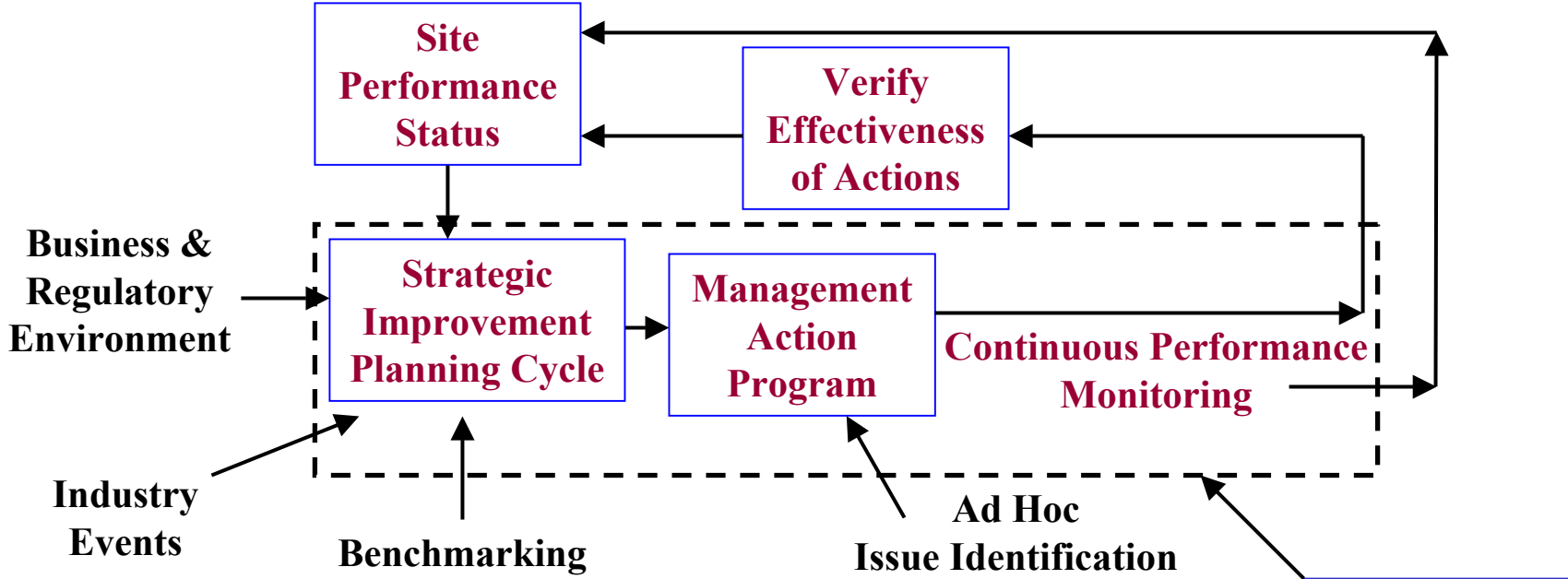


# NEI's View of Organizational Effectiveness

- 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



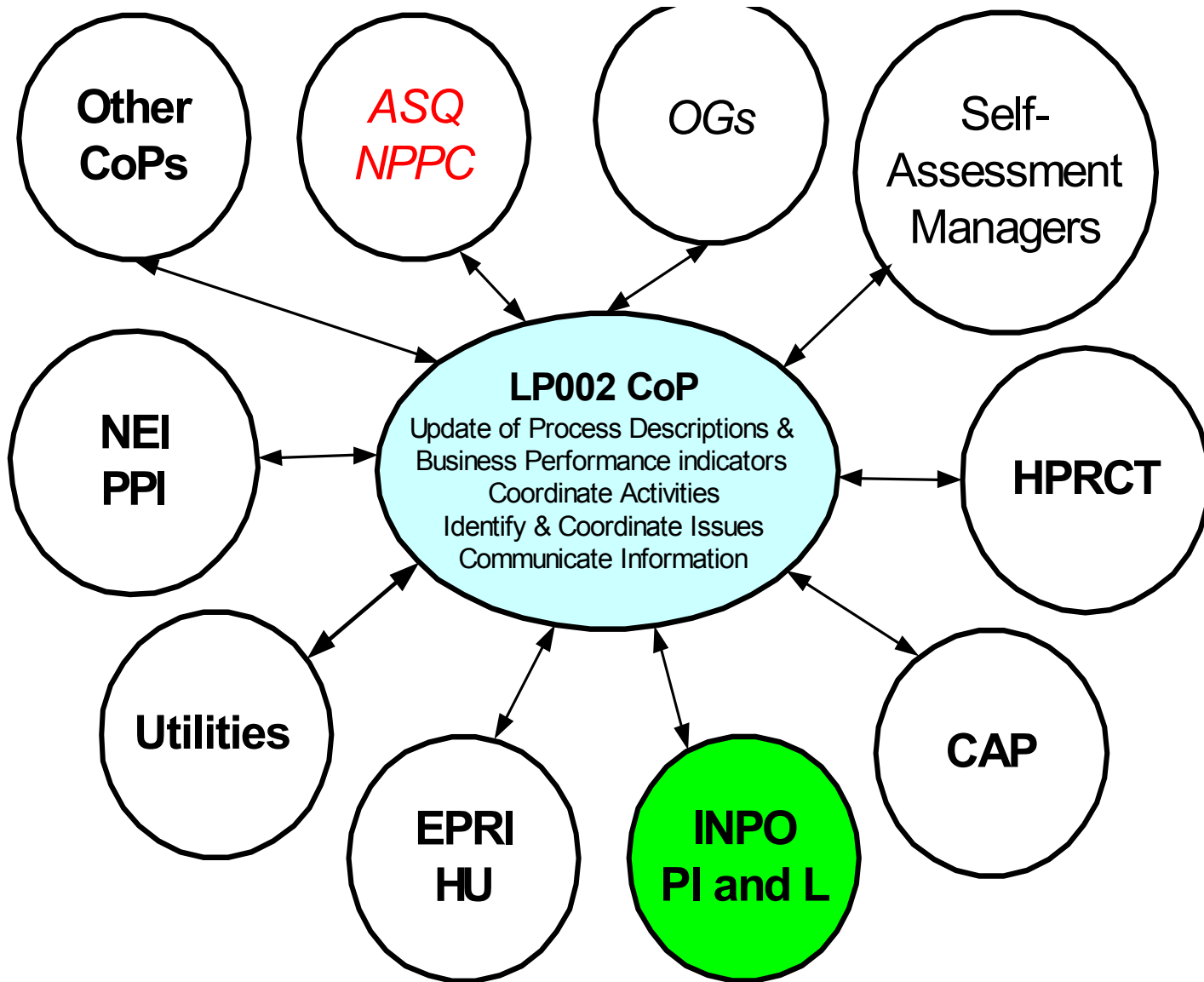
- Processes support the Business Cycle**
- Corrective Action (including External Operating Experience assessment and action tracking)
  - Performance Indicators/Trending
  - Assessment (Nuclear Oversight, and structured self-evaluation)
  - Site Performance Status reports

**Business Plan**



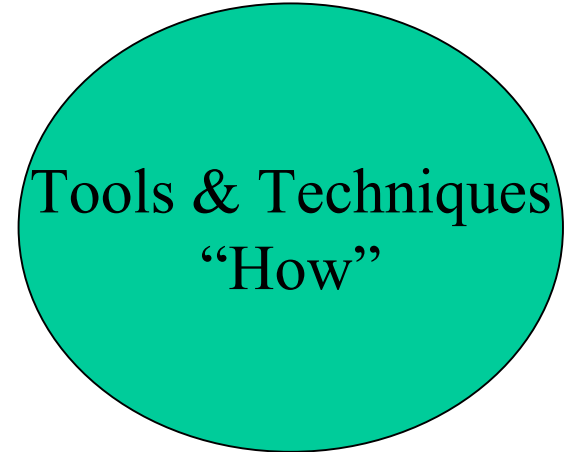
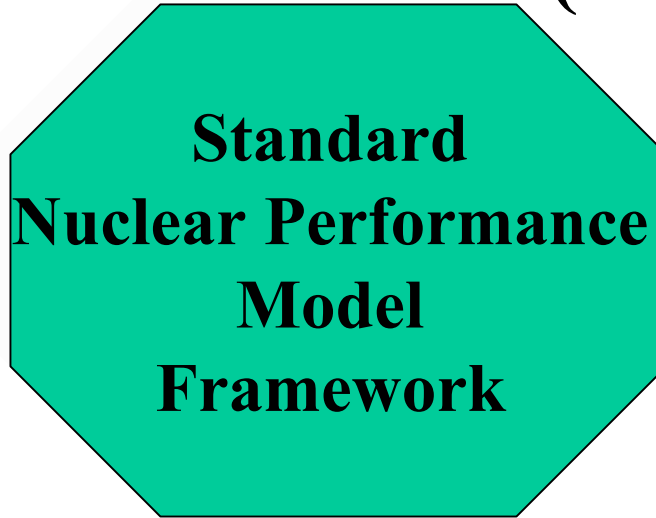
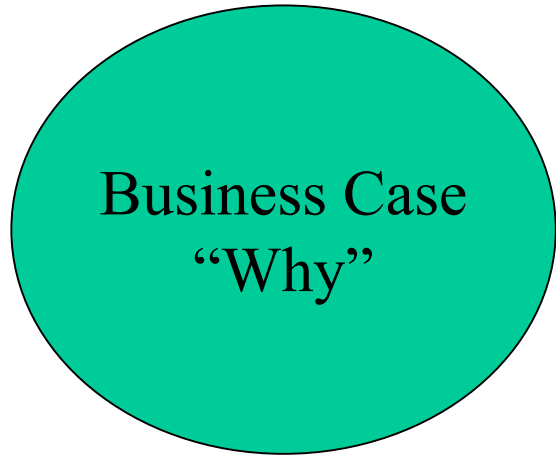
← **Human Performance (Leader/Management)** →

# NEI Proposed Performance Improvement Community of Practice





Big Picture → Specific Improvements (measured)



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

Business/Tactical Planning

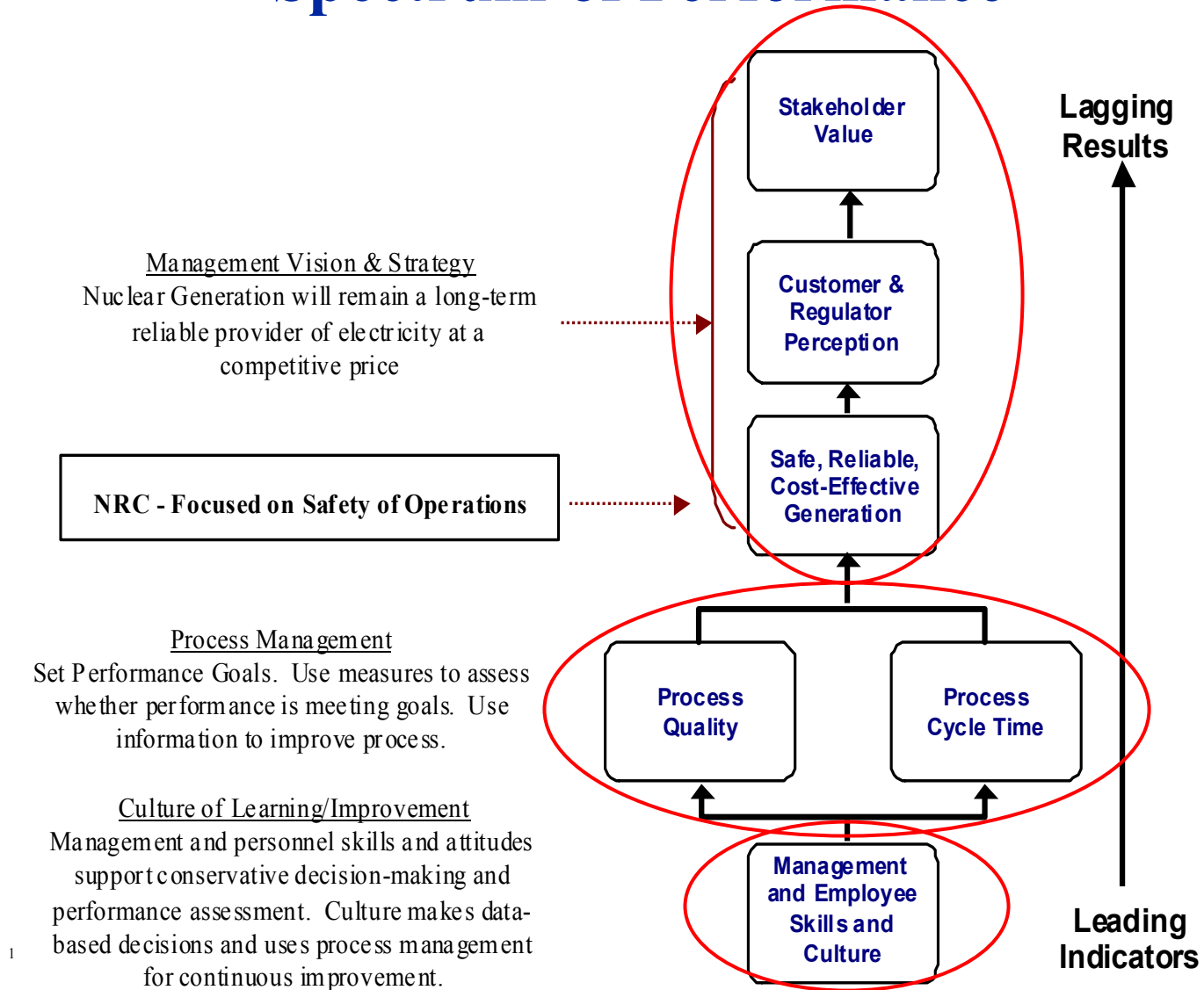
- Standard Processes
- Process Maps
- High Level KPIs
- Flexible Organization Design
- Benchmarking Projects
- Good Practices

Integrating Framework

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

Project Management

# Spectrum of Performance



# NPPC – Where to go?

**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

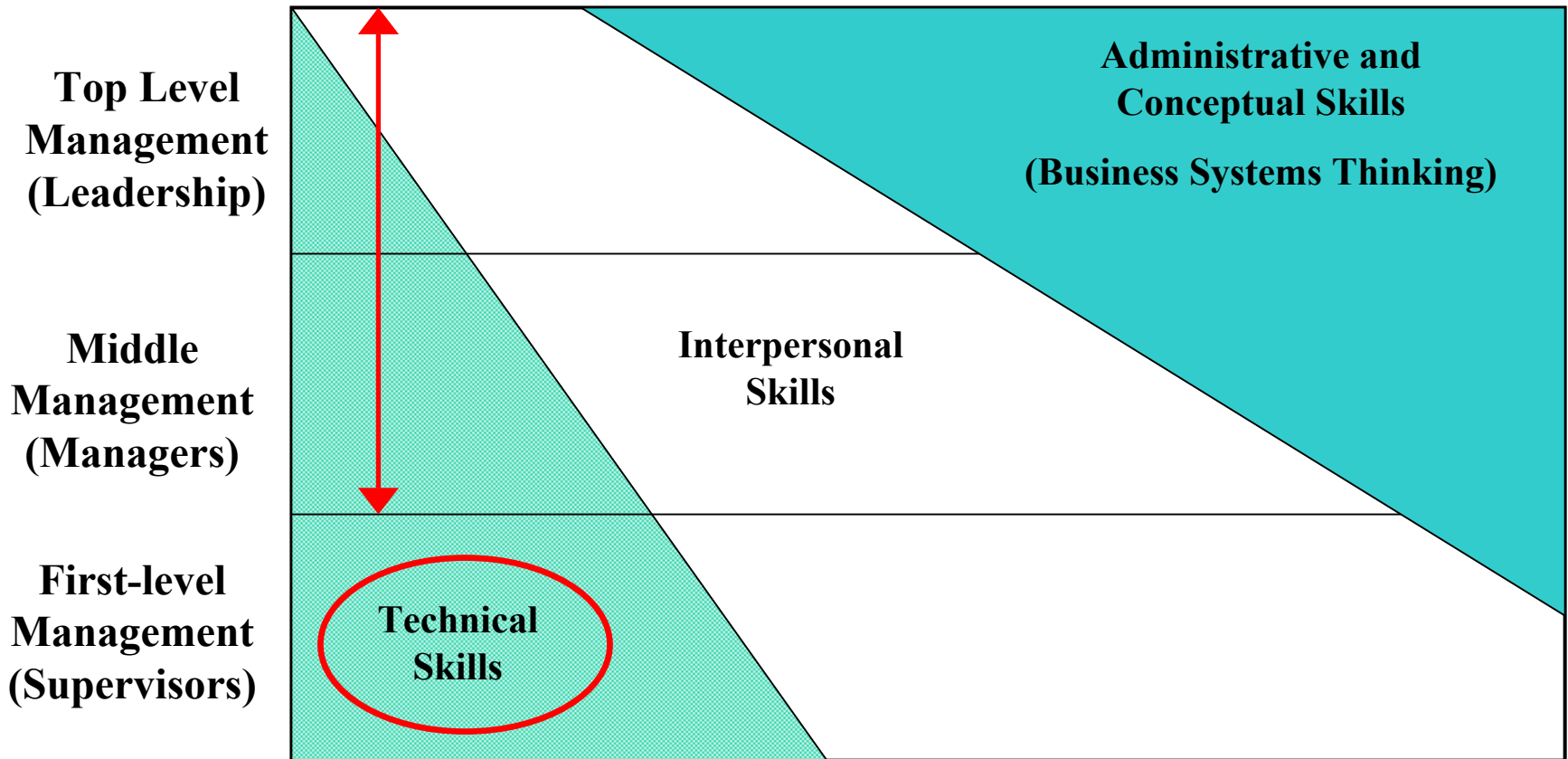
– the NPPC Mission still applies

- Quality Management Division
- Statistics Division

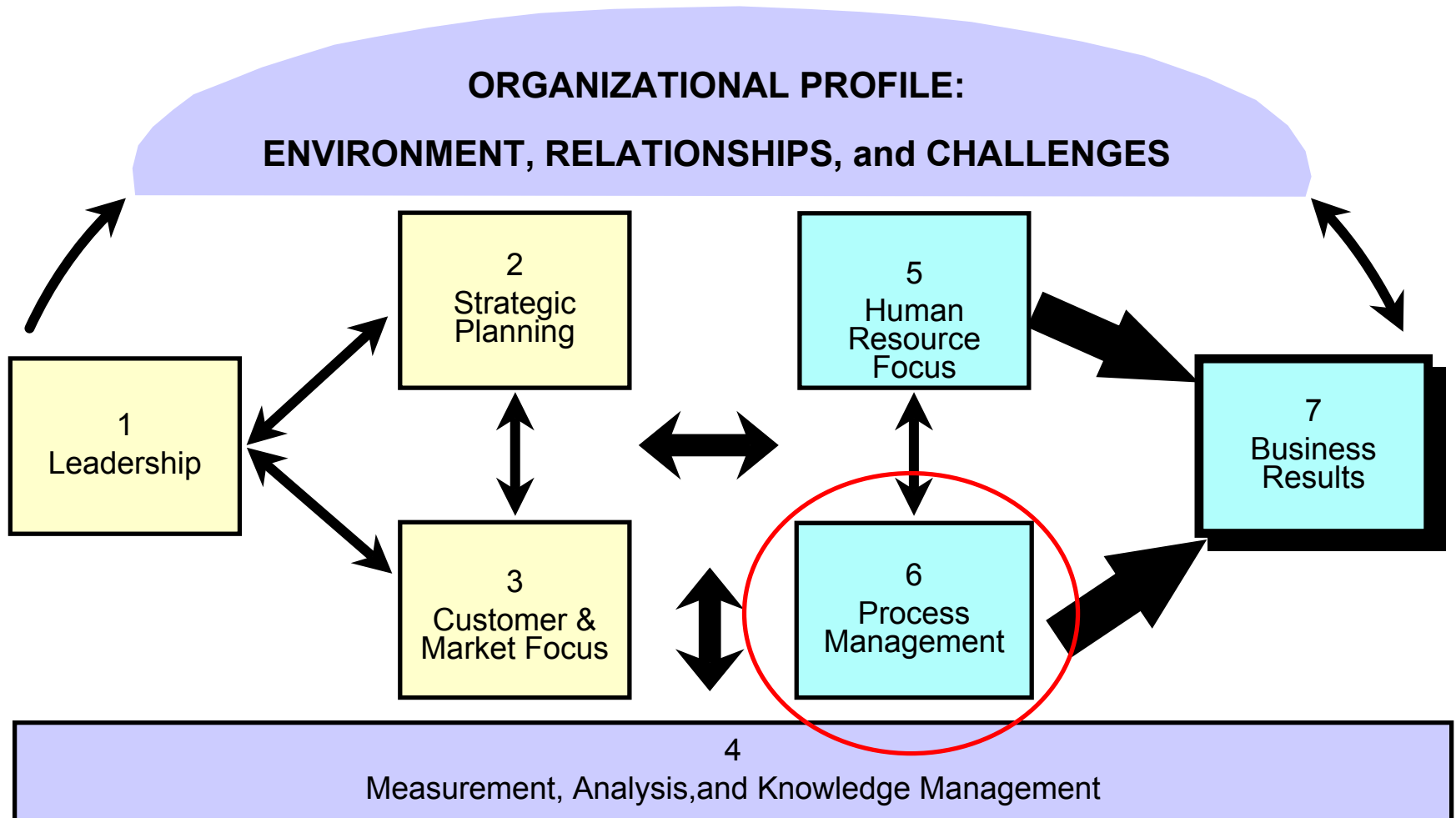
# Business Systems Thinking: Next Step for Performance Assessment

Where does your organization do most of its performance evaluation?

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



# Baldrige National Quality Program - 2003

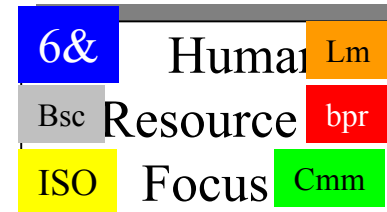


# Bringing It All Together

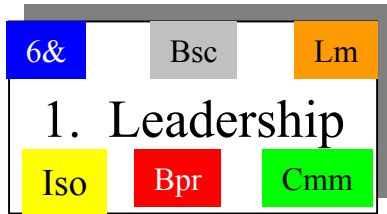
1. Malcolm Baldrige
2. ISO 9000
3. 6 Sigma
4. CMM
5. Lean Mfr
6. Bal Score Card
7. Bus Proc Re-eng



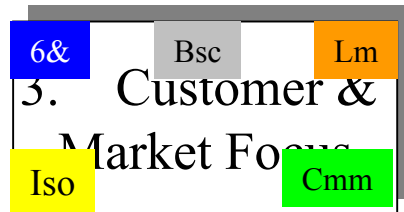
- Strategic Plans/Goals
- Operational Plans/Goals
- Financial Goals
- Technology Needs
- Initiatives/Supporting Actions
- Differentiation/Competitive Advantages



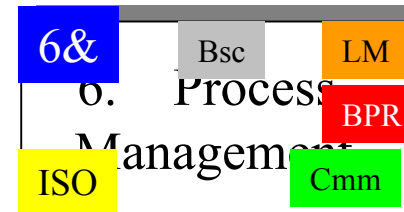
- Work Structures
- Performance Management System
- Training
- EE Development
- EE Environment & Services
- EE Satisfaction



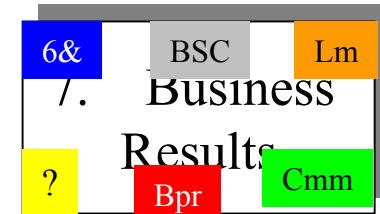
- Leadership
- M/V/V (aspirations)
- Operating Principles
- Governance
- Operational Reviews
- Social Responsibility



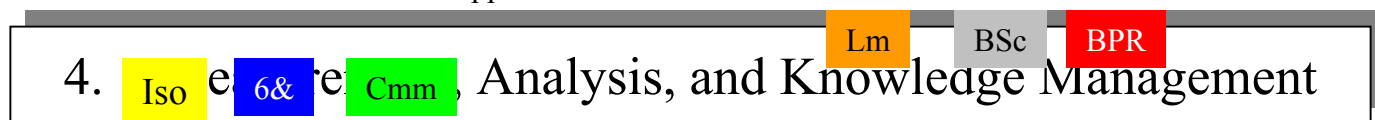
- Market Knowledge
- Customer Requirements & Segmentation
- Relationship Management
- Customer Support



- Value Creation Processes
- Support Processes



- Customer-Focused
- Product and Service
- Financial and Market
- Human Resource
- Organizational Effectiveness
- Governance and Social Responsibility



- Performance Measurement
- Performance Analysis

- Data and Information Availability
- Organizational Knowledge

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

- Business Systems Education
- Quality Award Evaluator ([www.nist.gov](http://www.nist.gov))
  - State Award evaluator
  - Baldrige evaluator
- American Society of Quality
  - Certified Quality Manager, others
  - Other Divisions
    - Management
    - Statistics