Developing Integrated Management System in NPP Owner/Operator Organization (Experience of TEPCO)

October, 2012

JAIF International Cooperation Center
(Temporarily dispatched from TEPCO)

Akio Toba
Contents

• History

• Recovery Action for Short Term Change

• Nuclear Renaissance Activities

• Management as a site (Example of KK NPS)

• Current Situation
History
Chronology

2003. April Initial assessment by American Experts
2003. July Nuclear Renaissance Group started
2003. August 1st Leadership Development Exchange
2004. September Initiation of PI(Performance Indicator)
2007. July Niigata-ken Chuuetsu Oki earthquake (KK site)
2011. March Great East Japan Earthquake
2012. September Announcement of Nuclear Reform of TEPCO
Report of falsification

- Inspection records were covered up in 29 cases over a period of 1988 to 1998.
  - Crack indication found on Core Shroud of 2F-3 plant in 1994.
  - No report to the regulators
  - Inspection findings removed from the record
  - Continuous monitoring of SCC crack growth
  - Cracks reported to the regulators before repair in 2001 as newly found information

- SCCs of PLR pipes found at 1F-1, 2, 3, 4, 5 plants over a period of 1992 to 1995
  - Type 304SS-made, with Induction Heat Stress Improvement technique
  - Replaced without reporting

- SCCs of PLR pipes found at 2F-3, KK-1, 2 plants over a period of 1997 to 2002
  - Type 316LC-SS-made
  - No report to the regulators
Recognition of Weakness

① Production Oriented Culture

② Overconfidence in Engineering Decision

③ Complacency on Operational Performance

④ Weak independent Verification and Oversight
① Production Oriented Culture

• Continuous power generation pursued based on one-sided judgment without sound verification and oversight

• Pressure from rapid growth of electricity demand and risk of supply shortfalls

• Engineering decisions justifying continuous generation praised while different views and second thoughts not welcomed
Overconfidence in Engineering Decision

- Subjective criteria requiring reports only when inspection results were judged as abnormal
  - \textit{Results were described as “no abnormality” for minor cracks unless judged as significant}

- No technical standards for evaluation
  - \textit{Tend to take a long time to get approvals from the regulators}

- Mistaken idea fostered by overconfidence
  - \textit{Failure to report could be permitted as long as there were no safety concerns over the physical plant conditions.}
③ Complacency of Operational Performance

• Complacency caused by good, stable performance in 1980
  – Management lost interests in learning from the experience of other countries.
  – Organizational learning attitude and continuous improvement weakened

• Lack of questioning mind caused by complacency
  – Overconfidence in material selection of Type 316LC-SS
  – Little attention to US experience
  – No questioning over excessive cold work
Weak Independent Verification & Oversight

- Weak capability of systematic independent verification and oversight of engineering decisions for maintenance
  - Strong vertical chain of command
  - Little cross functional rotation of human resources
  - Ineffective quality management because of unclear accountability and complicated work processes
Recovery Action for Short Term Change
Recovery Action for Short Term Change

① Reinforced ethics programs for stringent compliance

② Organizational transparency

③ Independent quality organization

④ Quality review by external experts

⑤ Material Management Plan against SCC
① Reinforced Ethics Programs

• Ethics programs for stringent compliance with laws and codes of conducts

• Corporate Ethics Committee
  – Chaired by President
  – Participation of external experts

• Guideline for behavioral standards
  – Safety first
  – Three pillars: compliance with rules, reliable behaviors, and open communication
  – Training required for all the executives and employees
② Organizational Transparency

• Non-conformance Control Program
  – Modeled after Corrective Action Program of US utilities

• Employee Concerns Program
  – Available to any sections of TEPCO, subsidiaries and contractors

• Community liaison committees in the vicinity of nuclear power stations
  – Operation information fully disclosed to the local community representatives
③ Independent Quality Organization

- Site Nuclear Quality Management Department established
  - Under direct control of the head office and independent of power stations
  - Assessing status of safety and quality
  - Instructing plant management to make improvements

- Nuclear Quality Management Dept at head office collects information and reports to the President.
④ Quality Review by External Experts

• Nuclear Safety and Quality Assurance Committee
  – Members are external experts.
  – Selecting subject matters of independent internal quality assessments
  – Examining assessment reports
  – Offering suggestions for improvement
  – Reporting to the President
Material Management Plan against SCC

• Management plan for prevention and mitigation of SCC re-established

• Susceptibility was evaluated based on:
  – Base material
  – Welding material
  – Chemical condition
  – Construction work records
  – Inspection records

• Necessary preventive actions determined
  – Stress Improvement by under-water peening
Nuclear Renaissance Activities
For Pursuit of Excellence
Concept of Renaissance Activities

Excellence

- Autonomous goal set by ourselves

Renaissance activities
- Continuous improvement for excellence
- Change Management
- Common work processes all through the sites
- Strong Sponsorship

Gear change

Conventional way
- Minimum improvement
- Low level goal & mind-set
- Driven from outside (compliance)

Current Level

External Requirement

- Benchmarking on the domestic and international best practices

All the activities for excellence to be integrated and coordinated

©2012 The Tokyo Electric Power Company, INC. All Rights Reserved.
Continuous Improvement in Pursuit of Excellence

• Continuous improvement activities launched in 2003

• Driven by aspiration to excellence in safe operation, rather than driven by minimum regulatory compliance

• Change Management applied
  – Setting vision and core values
  – Organizational learning
  – Leadership development
  – Process improvement and fleet-wide process commonality
  – Measurement of progress

©2012 The Tokyo Electric Power Company, INC. All Rights Reserved.
Vision and Core Values

【Vision】
“We will aim to realize trustworthy nuclear power stations that have the world’s highest levels of safety and quality.”

We will create workplaces full of energy and confidence by using all personnel working at power stations and building innovative work processes.

【Core Values】

Mechanism: Effective Communication, Clear Responsibility & Authority

Human: Integrity, Confidence & Pride, Faith in Changes

Symbiosis: Transparency, Promoting Security & Reliability, Respecting Local Communities

Code of Conduct
“Self-Accountability”

©2012 The Tokyo Electric Power Company, INC. All Rights Reserved.
Organizational Learning

• Organizational learning through domestic and international benchmark studies
  
  – *Benchmark trips to US plants to learn best practices*
    • Operational standards, equipment reliability process, work management, quality assurance, systematic development of human resources
  
  – *TOYOTA way*
    • Strong in soft skills to cultivate good behaviors and way of thinking as well as its famous management techniques
Organizational Learning (continued)

– TOYOTA way (continued)
  • Value such behaviors as
    – Listening to people carefully
    – Thinking what essential issues are
    – Encouraging and proposing
    – Providing ideas and wisdoms to win
    – Asking colleagues’ opinions
    – Respecting facts and realities
    – Rising to the change

• Gap analysis and self-assessment
  – Combined with benchmark studies
  – A part of Quality Management System
Organizational Learning (continued)

• External assessment as an important part of continuous improvement
  – *Inviting a group of US nuclear industry experts experienced in successful turnaround of plant safety and performance*
  – *An assessment by IAEA and a WANO peer review*

• Systematic use of operating experience
  – *A dedicated group established for analyzing information by experts who have knowledge about international practices*
Leadership Development

• Training to develop people for leading change in various levels of the organization of TEPCO and contractors

  – Two-week program providing a combination of behavioral skills and business management skills
    • Both types of skills are important to lead change
    • Synergic effect of learning both of them

  – 500 graduates as of March 2006
Process Improvement and Commonality

• Process improvement by Peer Groups
  – Process Areas
    • Operation
    • Maintenance
    • Radiation control
    • Quality and Safety
    • Internal Communication
    • External Communication
    • Human Resources Development

  – Most effective means to involve most knowledgeable people

  – Promoting better fleet-wide process commonality
Typical Configuration of a Peer Group

Peer Group Executive Sponsor

- KK Site
  - Superintendent
  - GM, Maintenance

- 1F Site
  - Superintendent
  - GM, Maintenance

- 2F Site
  - Superintendent
  - GM, Maintenance

- Headquarters
  - Director
  - Maintenance Manager

Peer Group Products

- Standard/common Processes
- Economy of Scale
- Share Best Practices
- Safer & Better Performance

©2012 The Tokyo Electric Power Company, INC. All Rights Reserved.
Peer Group Responsibility

- Standardizing and optimizing programs, processes, and procedures across the organization
- Process ownership
- Driving change initiatives and ensuring implementation & organizational compliance
- Creating functional area goals and Performance Indicators
- Monitoring performance
- Fostering identification and sharing of best practices as well as industry Operating Experience
- Managing the sharing of resources across the organization
- Continuous improvement processes
- Developing business plans and monitoring progress
Measurement of progress

- Performance Indicators designed to measure progress toward improvement goals

- Goals set up from the view point of
  - Internal and External customer value including safety and quality
  - Business value
  - Human and Technological development

- Three level Performance Indicators (PI)
  - The first level: Station performance
  - The second level: Process improvement progress
  - The third level: Activities for process improvement
Performance Review Meeting (PRM)

① Review performances using level 1-3 PI
② Capture the site issues
③ Set the specific actions (what, by when)
  - Participation from corporate, other sites, contractors etc.
  - Monthly

Site superintendent meeting

① Review & compare performances across the 3 sites
② Review & discuss the site focus issues
③ Review progress in each specific initiative in the focus areas
  - Participation of corporate executives, site superintendents etc.
  - Every 2-3 months

Station Management Reinforcement Training

LDE to provide skills which are necessary for change management

Framework of management in nuclear power & plant siting division

© 2012 The Tokyo Electric Power Company, INC. All Rights Reserved.
Management as a site (Example of KK NPS)
Introduction and Distribution of lessons learned from HE events

① Introduction at morning meeting of contractors (Monthly)

② Handing over of fliers (Weekly)
3. Case study for understanding of quality management system

Carry out case studies on cases chosen monthly

(Case study by TEPCO employee)  (Case study by sub-contractors)
May. 2004; Introduction of QMS (Quality Management System)
Mar. to Jun. 2005; Preliminary surveillance
Nov. 2005; Surveillance (Documentation)
Jan. 2006; Surveillance (Field)
Mar. 2006; ISO9001 Certification
Enhancement of safety acknowledgment by the rally

- Stopped all the maintenance work throughout the site
- After the rally by 5000 workers in the site, case studies were carried out at each working places
Current Situation
Framework for the Nuclear Reform of TEPCO

[Basic stance]  As of September 11, 2012
- Motivated by deep remorse for the accident that occurred at Fukushima Daiichi Nuclear Power Station, we are determined to abandon our previously held overconfidence in our current safety culture and measures and begin the implementation of management reforms.
- We are determined to prevent the reoccurrence of another disastrous accident. To this end, present safety policies will be reformed from the ground up while taking into consideration domestic and overseas expert opinions.
The "Nuclear Reform Monitoring Committee"

This committee, comprised of domestic and overseas experts, was established as an advisory body to the board of directors for the purpose of strictly monitoring reform implementation and progress.

[Main members of the committee]

- Dale Klein (Former Chairman of the Nuclear Regulatory Commission (NRC))
- Kenichi Ohmae (President of Business Breakthrough Inc.)
- Masafumi Sakurai (Former Member of the Nation Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC), former Superintending Prosecutor of the Nagoya High Public Prosecutors Office)
Thank you for your attention!