Risk management of Chubu Electric Power Company

October 7, 2013

Chubu Electric Power Co., Inc.
I Efforts of Chubu Electric Power Company

II Nuclear power related initiatives

III Tasks for the improvement of nuclear safety
Efforts for stable supply of power

<Corporate philosophy>
The Chubu Electric Power group will contribute to the development of the society by delivering energies essential to everyday life.

<CSR declaration>
The Chubu Electric Power group will respond to various energy needs, offer stable supply with priority on safety, and strive to preserve the global environment by displaying its capabilities in the core energy business while utilizing unique aspects as a growing corporate group, thereby contributing to the development of a sustainable society.

Stably deliver safe and cheap energy to customers

<Base action since establishment>
In order to secure public safety and realize stable supply, maintain and improve response capabilities, including human aspects such as training, for disaster prevention measures to be implemented during a disaster and post-event measures to be implemented for early restoration, in addition to preliminary equipment measures.
Risk management structure

- “Risk management regulation” was enacted (March 2007) and risk management structure was clarified.
- A department in charge of risk management was established in the Corporate Planning & Strategy Division (October 2007)

Corporate Planning & Strategy Division

Risk Management Team (6 permanent members, at present)

Company-wide, comprehensive risk management

- Grasping, evaluating and reporting “significant risks”
- BCP (Business Continuity Plan), BCM (Business Continuity Management)
- Risk communication with core divisions

Risks management of specific specialized businesses

- Market risk management of power trade, fuel trading, etc.
- Business investment evaluation
Yearly risk management cycle

[Each division]

- Risks are regularly grasped and evaluated every year
- "Significant risks" that could have a serious impact on management are reported to the Corporate Planning & Strategy Division General Manager

[Management meeting, Corporate Strategy Division]

- "Significant risks" are comprehensively grasped and evaluated from a company-wide perspective and reported in the board of directors’ meeting (utilize "risk map")

- Measures for “significant risks” are reflected in the management plan (board of directors’ meeting)
- Risks measures of each division are checked if they are reflected in the work operation plan (Corporate Planning & Strategy Division)

- Implementation status is evaluated and reported
- Review is conducted by the division manager

- Plans and performance are evaluated and reviewed
- Review is conducted by the board of directors

<Roles of the risks management team>

- Analyze and evaluate “significant risks” grasped by each division through discussions (check if there are risks that have not been grasped).
- Check the actions of each division toward significant risks, written in the work operation plan.
Significance of risks of the company is clarified by displaying risks in relative positions, as shown below, and **reporting risks to be handled with priority to the board of directors**.

**Nuclear disaster risk**
(Before 3.11, nuclear disaster risk was not handled as management risk, and risk mitigation measures were implemented by the nuclear power division)

“**Significant risks**” that could have a significant impact on management

- Risk event

**<After 3.11>**

“**Risks with extremely large impact due to exposure**, regardless of frequency”
Recognition of nuclear disaster risks before the Fukushima accident

- Interference of supply due to natural disasters was recognized as “significant risk”.

- On the other hand, since various measures were taken for nuclear disaster risks, it was acknowledged that the possibility of occurrence of an accident was extremely low.

- Therefore, **nuclear disaster risks were not handled as management risks, and risk mitigation measures were implemented by the nuclear power division.**

⇒ **Since 3.11, nuclear disaster risks are managed along with “significant risks” as “risks with extremely large impact due to exposure”, regardless of frequency.**

**Implementation of a corporate management that follows risk management cycles** which involves among other things reports to the board of directors and such, and reflected revisions to business execution plans and to administrative plans for risk management.
In order to accomplish the public mission of safely and stably delivering energy to customers, the Chubu Electric Power Company group will make utmost efforts to continue business by **taking all possible measures for the securing of public safety and equipment maintenance** as well as realizing early restoration while **keeping the impact of the disaster at minimum in case a large-scale disaster occurs**.

1. **Develop equipment strong against disasters** and appropriately implement maintenance
2. Maintain and improve response capabilities through trainings while **organizing a disaster prevention structure aimed at securing of public safety** and early restoration
3. Appropriately adopt new knowledge, and continuously raise the level toward safe and stable supply of energy
Initiatives of BCP (Business Continuity Plan) of Chubu Electric Power Company (2)

As a measure against “significant risks”, take action to continue business in the event of a large-scale disaster

⇒ Specify work to be prioritized in the event of a large-scale disaster (=emergency priority work) by work restart time

⇒ Take response process of TEPCO and Tohoku Electric Power Company for 3.11 and knowledge for restoration support into account

⇒ Check tasks and examine measures for implementing emergency priority work

Subsequently, annually inspect the contents of the developed BCP (emergency priority work, related tasks, response action status), and report it to the board of directors (BCM: Business Continuity Management).

Actions for business continuity

**Work**
- Specify emergency priority work
- Specify necessary management resources
- Examine tasks and response measures
- Organize work rules
- Education / training

**Equipment**
- Project damage
- Project demand and supply after the disaster
- Project restoration
- Examine demand and supply measures
- Examine equipment measures

---

Outcome of large-scale earthquake review WG (2003 Central Disaster Management Council)

Review of the Large Nankai Trough Earthquake (Central Disaster Management Council)

Requirements of the new regulation standards
Risk management and crisis management

“Risk management” before risks are exposed and “risk management” after they are exposed are essential, and recurrence prevention measures for critical events that occurred are reflected in subsequent risk management.

Corporate philosophy of the Chubu Electric Power Company group / Chubu Electric Power Company CSR declaration
(Basic policies on risk management and crisis management)

- Risk management (normal times)
  - Risk management rules
  - BCP / BCM
  - Basic compliance policy
  - Personal information protection rules
  - Grasping and evaluating risks
  - Risk measures
  - Inspection / Improvement

- Crisis management (emergency)
  - Emergency disaster response rules
  - Nuclear disaster response rules
  - Power demand rules
  - Crisis management rules
  - Initial response (Detection, notification, response)
  - Damage control
  - Restoration

- Reflection
In the event of a critical event or when its occurrence is predicted, the head office, branch office and front-line field are to issue a disaster prevention structure each, and set up an emergency response headquarters. Response personnel are to engage in predetermined duties in the response division.

Disaster response and restoration trainings are to be conducted company-wide and in field units.

The crisis response headquarters during a nuclear disaster was reformed and enhanced to have a dual structure along with the emergency disaster response headquarters, after 3.11.
I Efforts of Chubu Electric Power Company

II Nuclear power related initiatives

III Tasks for the improvement of nuclear safety
Initiatives after the Fukushima accident
(Preparations for earthquakes)

Changes of regulation and standards were adapted to, and safety concerning earthquakes was voluntarily improved, in particular, based on latest knowledge.

- 1978  Seismic design guidelines were enacted
  Seismic design of the newly constructed plants (Hamaoka Units 3-5) were based on the guidelines
- 1980  Back check was conducted on the constructed Hamaoka Units 1 and 2
- 1995  South Hyogo Earthquake occurred
- 2001-2002  2003 Central Disaster Management Council model was reviewed (projecting Tokai earthquake)
- 2003-2008  Voluntary measures for the projected Tokai earthquake were implemented
- 2005-2008  Seismic margin improvement work was conducted
- 2006  Seismic design guidelines were revised
- 2007-2010  Measures based on the Niigata Chuetsu-oki Earthquake were implemented
- 2009  Measures for Suruga bay earthquake were implemented

* Underlined items are voluntary safety improvement action
Seismic margin improvement work

(Seismic margin improvement work)
- In 2005, after checking and evaluating seismic safety reflecting latest knowledge, it was decided to conduct construction work to further improve seismic margin (countermeasure construction voluntarily setting target seismic motion at 1,000 gal), and work for Hamaoka Units 3-5 was completed in 2008.

(Stopping of operation of Hamaoka Units 1 and 2)
- In 2008, seismic margin improvement work was examined for Hamaoka Units 1 and 2. As a result, it was concluded that a vast amount of money and time will be required for the construction work, and it was judged that conducting construction work and restarting operation is economically inefficient. It was determined to stop operation of Hamaoka Units 1 and 2 and planned to construct Hamaoka Unit 6 instead.
Safety Culture and Quality Management System (QMS)

Safety culture fostering activities

Monitoring and feedback on symptoms of deterioration of safety culture

Achievement of nuclear safety

Quality Management System

Plant operation, maintenance management, radiation management, fuel management, etc.

Plan

Act

Check

Output

QMS is influenced by the fostered safety culture

© 2013 Chubu Electric Power Co., Inc. All rights reserved.
Efforts to foster safety culture

P (Plan)
- Setting yearly goals
- Policy to grasp signs of deterioration of safety culture
- Setting evaluation indicators etc.

D (Do)
- Checks the results of the evaluation / analysis based on a questionnaire survey and other assessments.

C (Check)

A (Act)
- Revisions of the action plan for the next year reflecting the evaluation

<Policy>
- Maintain a constantly questioning, learning and reporting mindset and foster safety culture
- Comply with laws and agreements with local governments concerned
- Strive to maintain and improve technical skills and share information, and carry out work with a sense of pride and mission

[Example of activity result](from FY2011-2012 employee survey)
- Lower awareness of “constantly questioning mindset” was observed
- Measures (discussion at various departments) were taken
- Recovery was observed from subsequent surveys
All units of the Hamaoka Nuclear Power Station was shut down upon request for shutdown from the Prime Minister. Further tsunami measures were implemented and communication that leads to recovering trust of the public was examined toward early restart of operation.

Establishment of the “Hamaoka safety measure committee” (May 2011)
(Purpose) ・Organize tasks and examine measures toward prompt implementation of safety margin improvement measures
　・Measures toward recovering trust on the safety of nuclear power stations, such as measures assuming emergency situations and severe accidents and development of a disaster prevention structure, were examined

① Create a structure that promptly makes decisions on measures necessary to respond to risks
② Have an adequate approach to risks of natural phenomena that occur less frequently and have greater uncertainties, other than earthquakes
③ Recover trust on safety improvement action of nuclear power stations
(1) Structure for prompt decision-making

[Structure of the Hamaoka safety measure committee]

Chair: President  Members: All division managers
  • Report to all divisions, share information, collect opinions

Hamaoka safety measure committee

Equipment measure WG
  • Equipment design / process management
  • Examine and develop equipment measures assuming severe accidents

Disaster prevention WG
  • Review internal disaster prevention structure
  • Enhance coordination with national and local governments

PA WG
  • Develop and implement PA (safety measures, disaster prevention, recovery of trust) strategies

Equipment measures for before, during and after an accident (hard measures)

Disaster prevention measures for during and after an accident (soft measures)

Risk communication

• Aiming for prompt decision-making, management, including top level personnel, and executive officers are to examine and compile response measures together.
• Risk measures of divisions involved with nuclear power are to be comprehensively examined.

Promptly make decisions on installation of breakwaters and implementation of tsunami measure construction work before the contents of the new regulation standards are announced.
(2) Adequate approach to nuclear disaster risks (future-1)
(Use of probabilistic risk assessment (PRA))

**<Improvement of safety level inside power stations>**
Methods for all risk factors are not established in PRA, but by comprehensively evaluating plant safety against beyond-design-basis events, **weaknesses of the plant can be evaluated and the effects of the measures can be quantified, thereby acting as an effective tool for the improvement of plant safety level.**

**<Appropriate combination of evaluations>**

- Safety evaluation by Level 1-2 PRA
  - PRA of internal factors, shutdown, earthquake, tsunami
  - Research and development concerning external events with great uncertainty

- Deterministic safety evaluation

- Safety margin evaluation similar to stress tests
(2) Adequate approach to nuclear disaster risks (future-2)
(Use of probabilistic risk assessment (PRA))

<Improvement of safety level outside power stations>
In order carry out the nuclear power business, it is necessary for operators to actively support the development of disaster prevention plans and evacuation plans of local governments and the review of such plans for during and after an accident so that the safety of local residents may be secured in the event of a nuclear disaster.

(Operator)  (local government)

**Development of the evacuation plan**
- Event progress scenario, estimation of amount of release
- Spread pattern of radioactive materials etc.

Use for the development of the disaster prevention plan and evacuation plan

**Evacuation**
- Progress of event, amount of release
- Estimation of spread of radioactive materials etc.

Use for resident protection measures

[Coordination of on-site and of-site parties]
(3) Recovery of public trust on nuclear safety
(Risk communication)

- Safety design and evaluation of nuclear power stations were deterministically conducted, and safety was also deterministically explained.
- On the other hand, since risks of nuclear power stations will not be zero, it is necessary to carry out risk communication upon indicating risks to the society so that nuclear power may be accepted.

- Strive for continuous improvement of safety based on new knowledge, as an operator with primary responsibility for securing safety.
- Although efforts will be made to minimize risks, they will not become zero. Therefore, thoroughly develop measures for during and after an accident.
- Engage in risk communication by using quantitative indicators (PRA results) and such, while actively disclosing information on such initiative, so that nuclear power may be accepted.
I Efforts of Chubu Electric Power Company
II Nuclear power related initiatives
III Tasks for the improvement of nuclear safety
Enhancement of risk response capabilities as an organization

- **Improve the functions** of the temporarily established Hamaoka safety measure committee to become a permanent committee for continuously improving voluntary safety (position continuous actions of 19 - 21 as part of the risk management cycle)

- **Enhancement of risks management functions**
  - **Enhance the management process** so that measures for “significant risks” which could have a significant impact on management are reflected in the work operation plan for sure
  - **Develop human resources with risk / crisis management skills**, accumulate and improve organizational know-how
  - Develop a **structure where the risk management team** (Corporate Planning & Strategy Division), directly linked to management, can **efficiently coordinate with the emergency response headquarters and take agile action** even under crisis management during an emergency

- **Incorporate risk communication function in nuclear PA** (public acceptance)
Communication with local society

Although efforts will be made to minimize risks, they will not become zero, and no matter how small the frequency, once it occurs, probability becomes “1”. Therefore, **it must always be kept in mind that the impact of exposed risks are critical to the society.**

- Make efforts to deepen communication with the local society **by providing information useful to developing and improving plans and grasping their effects as an operator** so that the disaster prevention plan and evacuation plan of the local region becomes effective.

**Providing PRA information** to be used for the evaluation and improvement of disaster prevention plans and evacuation plans **is likely to increase anxiety of the local region.**

- As personal values are becoming more diversified and complex, it is not easy to gain consensus of the entire society, **but support for the creation of an environment where the efforts of operators lead to the acceptance of nuclear power is desired.**
Since nuclear power has a critical impact on the society and endangers its continuance once a major accident occurs, nuclear safety is acknowledged as an extremely important issue in management.

Therefore, Chubu Electric Power Company will make utmost efforts to secure nuclear safety by constantly reflecting latest knowledge and taking action for the improvement of safety.