Japanese Power Companies' Determination

to Restore the Public Trust

Makoto YAGI

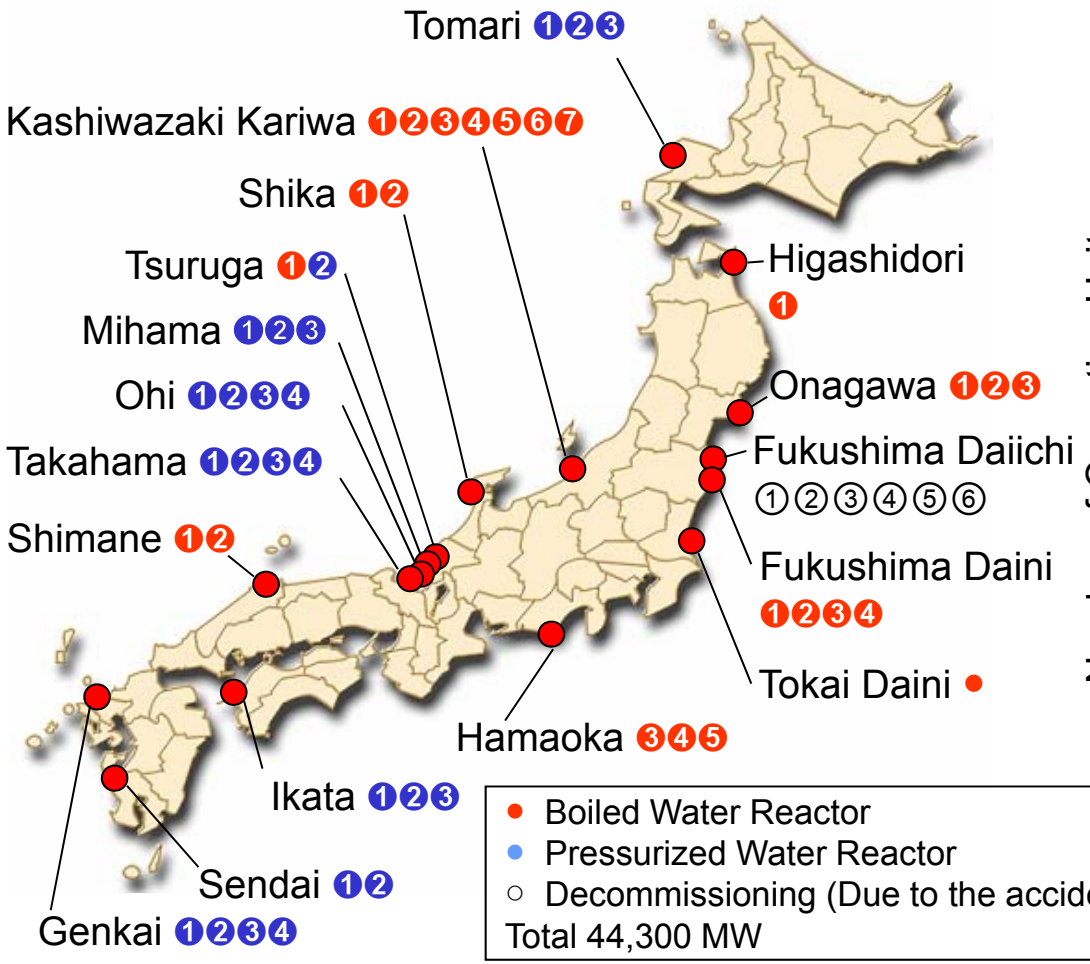
Chairman

The Federation of Electric Power Companies

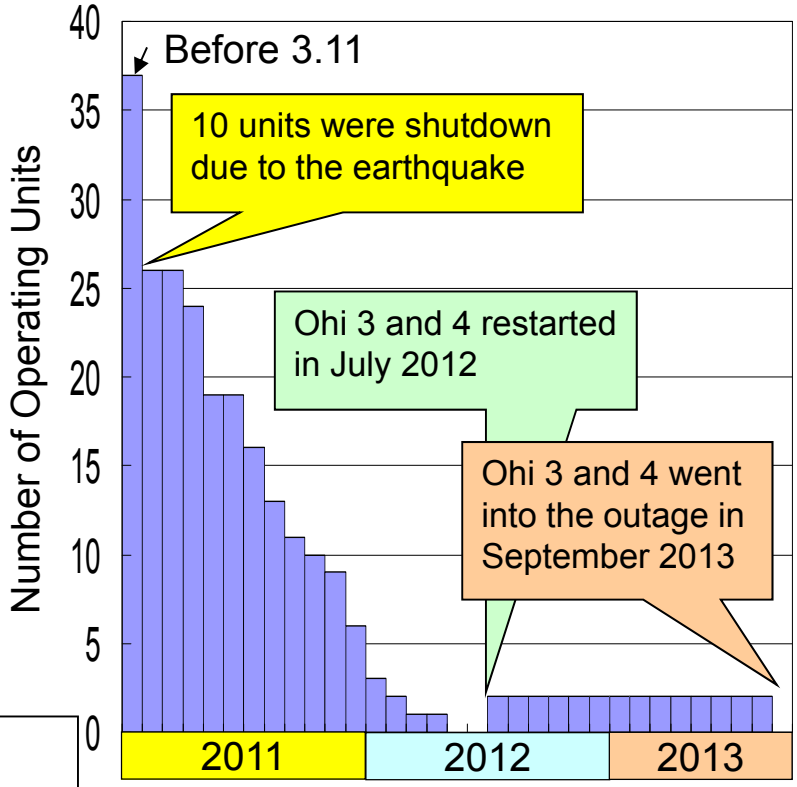
1. Current Status of Nuclear Power in Japan

Current status of nuclear power in Japan

- After 3.11, all of 48 NPPs were shut down for refueling outages one by one by May 2012.
- Ohi 3 and 4 restarted in July 2012 were shutdown again for refueling outages and the nuclear power generation had reduced to zero again.



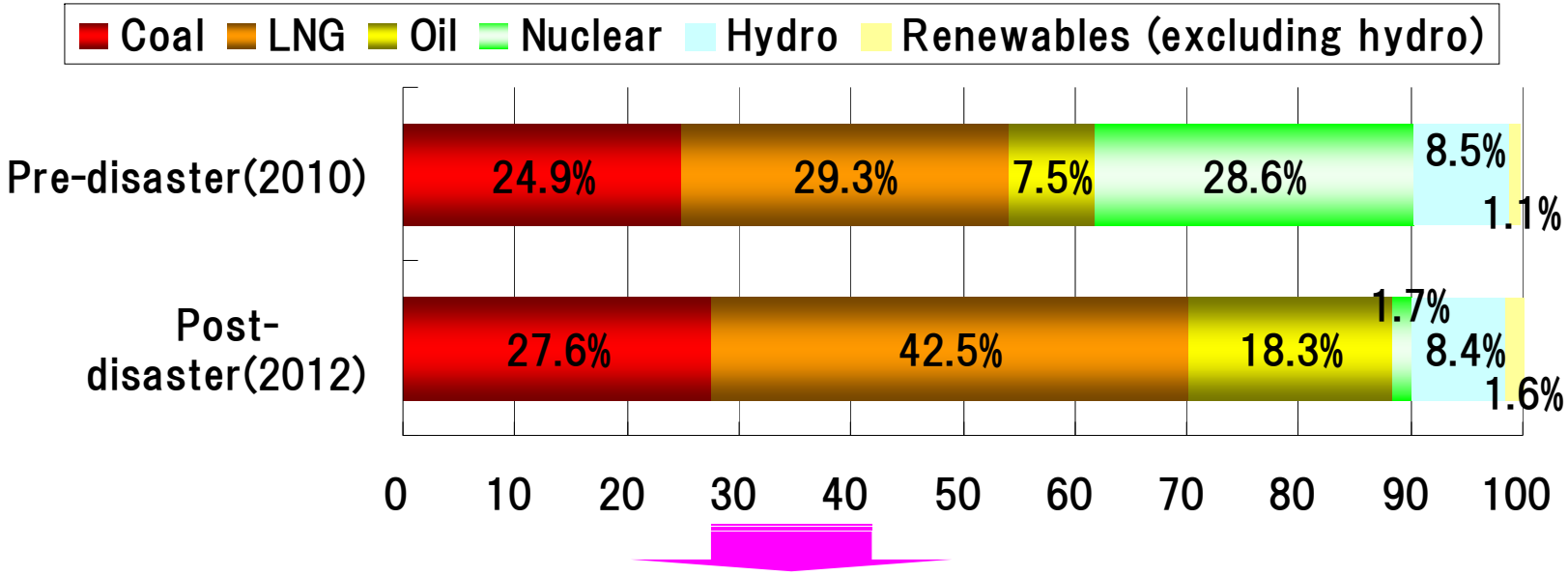
Operating Units after 3.11 in Japan



The state of Japan's energy mix after the disaster

- Prior to the disaster Japan had a balanced energy mix
- Due to concerns about safety (S) in the wake of the disaster, the operation of nuclear power plants has not commenced and Japan's energy mix has become unbalanced therefore resulting in damage to all of the 3E.

【Comparison of energy production by energy source】



Stable supply
Supply-demand imbalances
(Request to conserve energy during the summer and winter)

Economic efficiency
Drastic rising fossil fuel costs
(**3.6** trillion yen→**7.0** trillion yen)

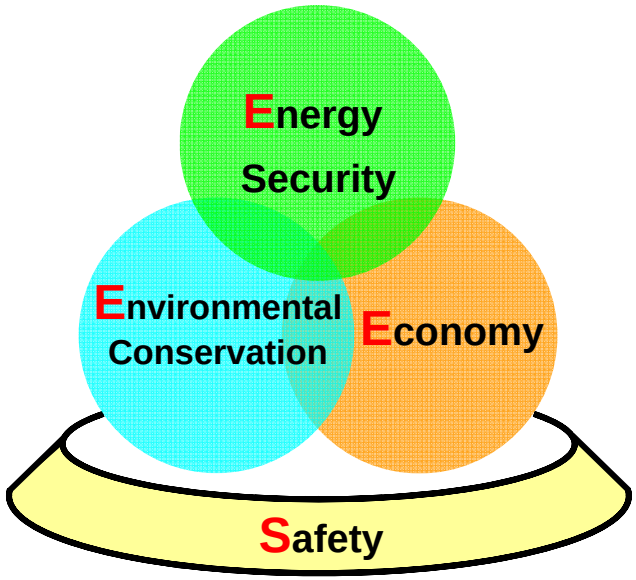
※Comparison between FY2010 and FY2012

Environmental friendliness
Increase in CO_2 emissions
(374 million t-CO_2 →486 million t-CO_2)

※Comparison between FY2010 and FY2012

Japanese utility's stance on nuclear power

Basic Concept 'S plus 3 Es'



Japanese Utility's Stance on Nuclear Power

1. Utilize nuclear power as an important source (which has advantage in **3 Es**)
2. Ensuring safety is major premise
3. Making efforts to restart the NPPs
4. Making efforts for completion of reprocessing facility in the sight of its importance

Safe operation (S) is major premise to utilize nuclear power

With a sense of urgency, "Unless safety can be ensured, there is no future for Japan's nuclear power," we are determined to "continue our own reform to achieve the world highest level of safety."

2. Current Perspectives on Restart of Nuclear Power Plants

State of the safety screenings under the new regulatory requirements

- In July 2013 new regulatory requirements for nuclear power plant safety were executed
- Eight licensees submitted applications of 17 NPPs for safety screenings under the new regulatory requirements
- Currently, licensees are earnestly responding to the NRA's reviews

Licensee	Application (reactor type)	Submission
Hokkaido	Tomari 1/2/3 (PWR)	July 2013
Tohoku	Onagawa 2 (BWR)	Dec. 2013
Tokyo	Kashiwazaki-Kariwa 6/7 (BWR)	Sep. 2013
Chubu	Hamaoka 4 (BWR)	Feb. 2014
Kansai	Takahama 3/4 (PWR) Ohi 3/4 (PWR)	July 2013
Chugoku	Shimane 2 (BWR)	Dec. 2013
Shikoku	Ikata 3 (PWR)	July 2013
Kyushu	Sendai 1/2 (PWR) Genkai 3/4 (PWR)	July 2013
Total	17 reactors	

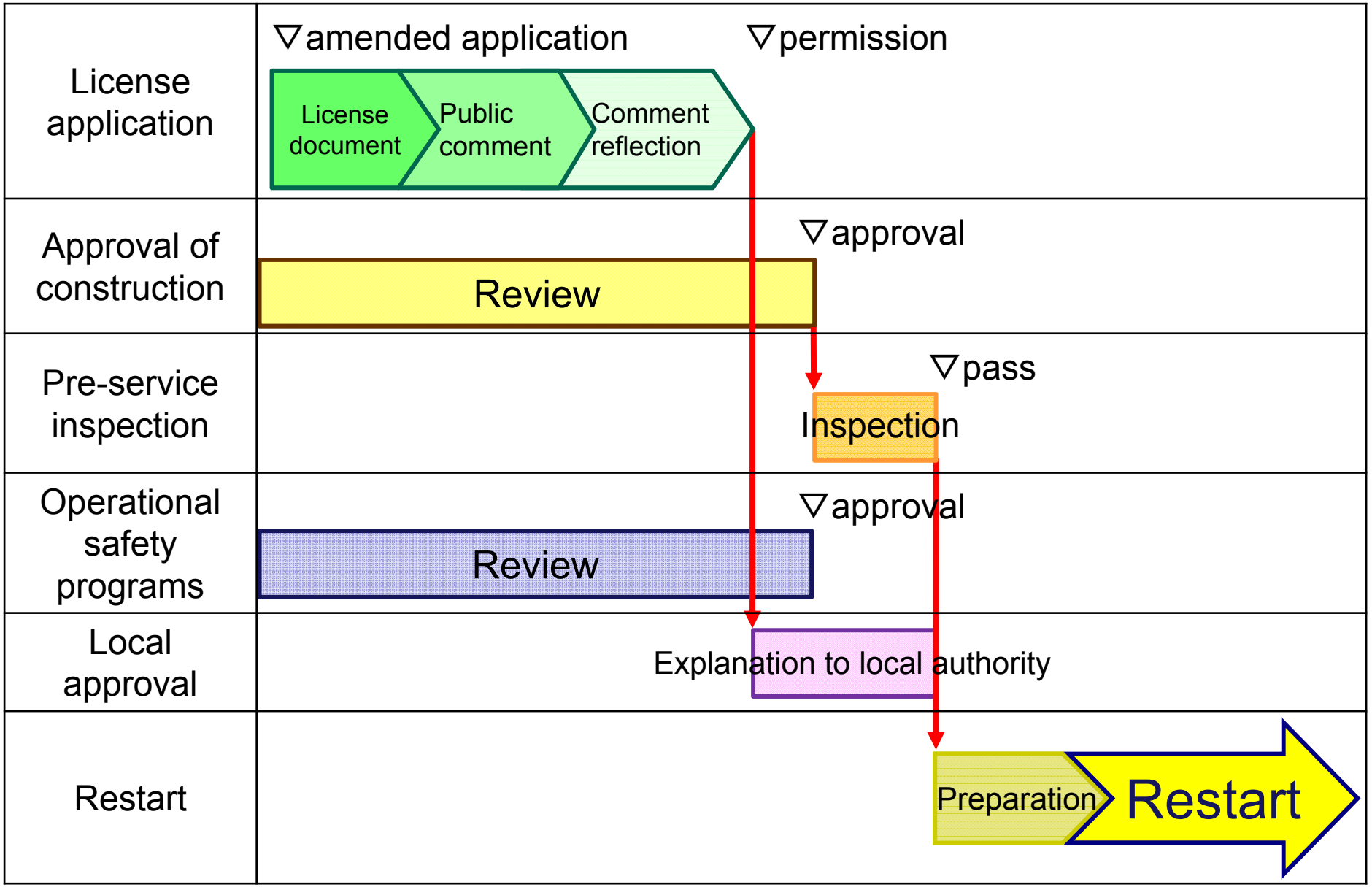
Selection of plants to be prioritized for screening

- The NRA has decided to prioritize screenings at Sendai Unit 1 and 2 where amended applications will be submitted and draft license documents will be issued. (on March 12, 2014)
- The prioritized plants are supposed to attain a certain level of qualification required for NRA's screening.
- It is expected that inspections of these prioritized plants will help to make screenings of plants thereafter more efficient.

Prioritized plant inspections refers to:

- Licensee submits the amended application and NRA develop the draft license documents
- NRA shall prioritize these inspections in order to develop high-quality license documents that will become the model for plant screenings to follow

Schematic schedule for restart of NPP



3. Operator's Efforts to Restore the Public Trust

(1) Pursuit of the world's highest level of Nuclear Safety

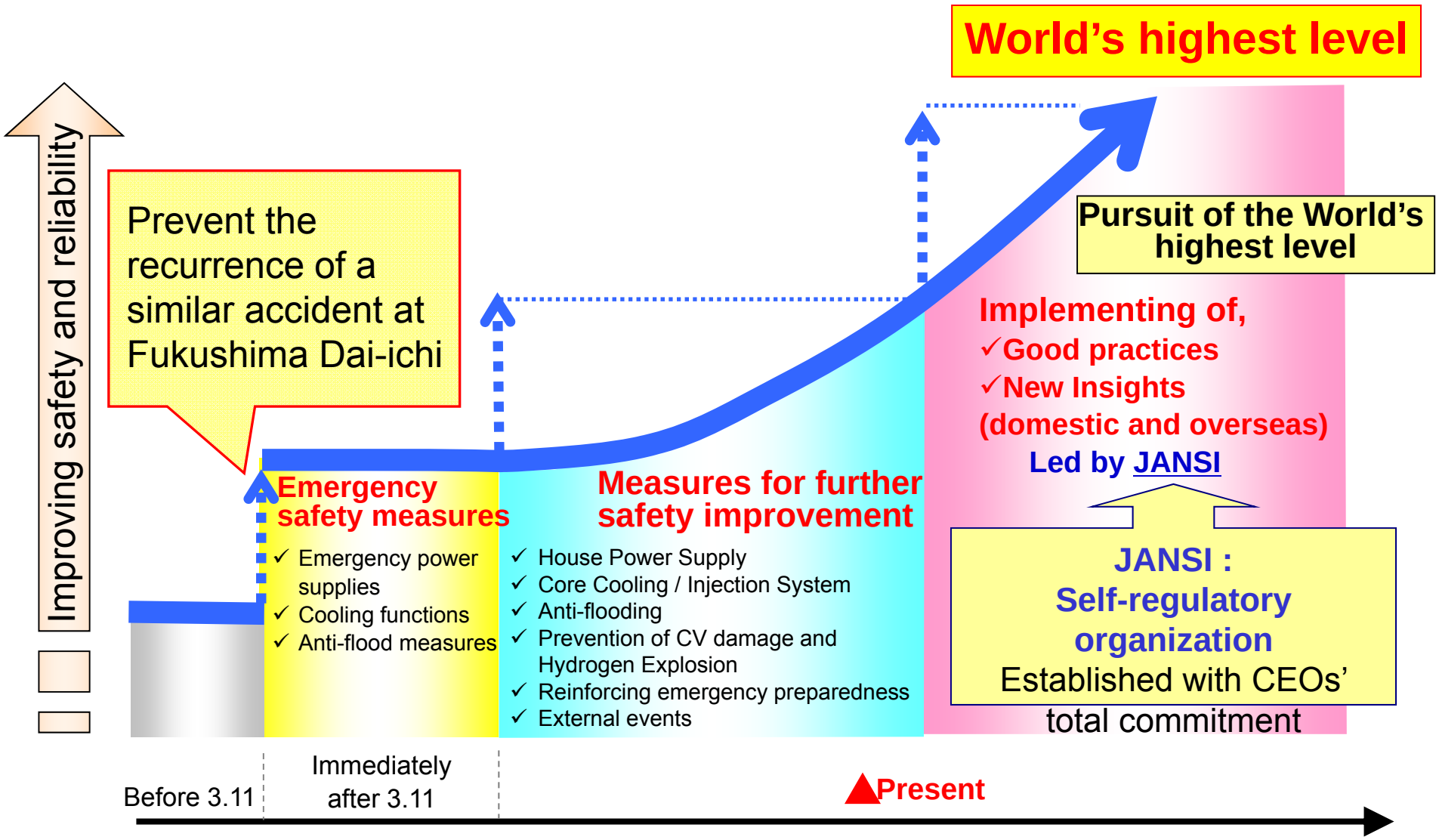
(2) Measures for Safety Improvement

(3) Improvement of Nuclear Emergency Preparedness

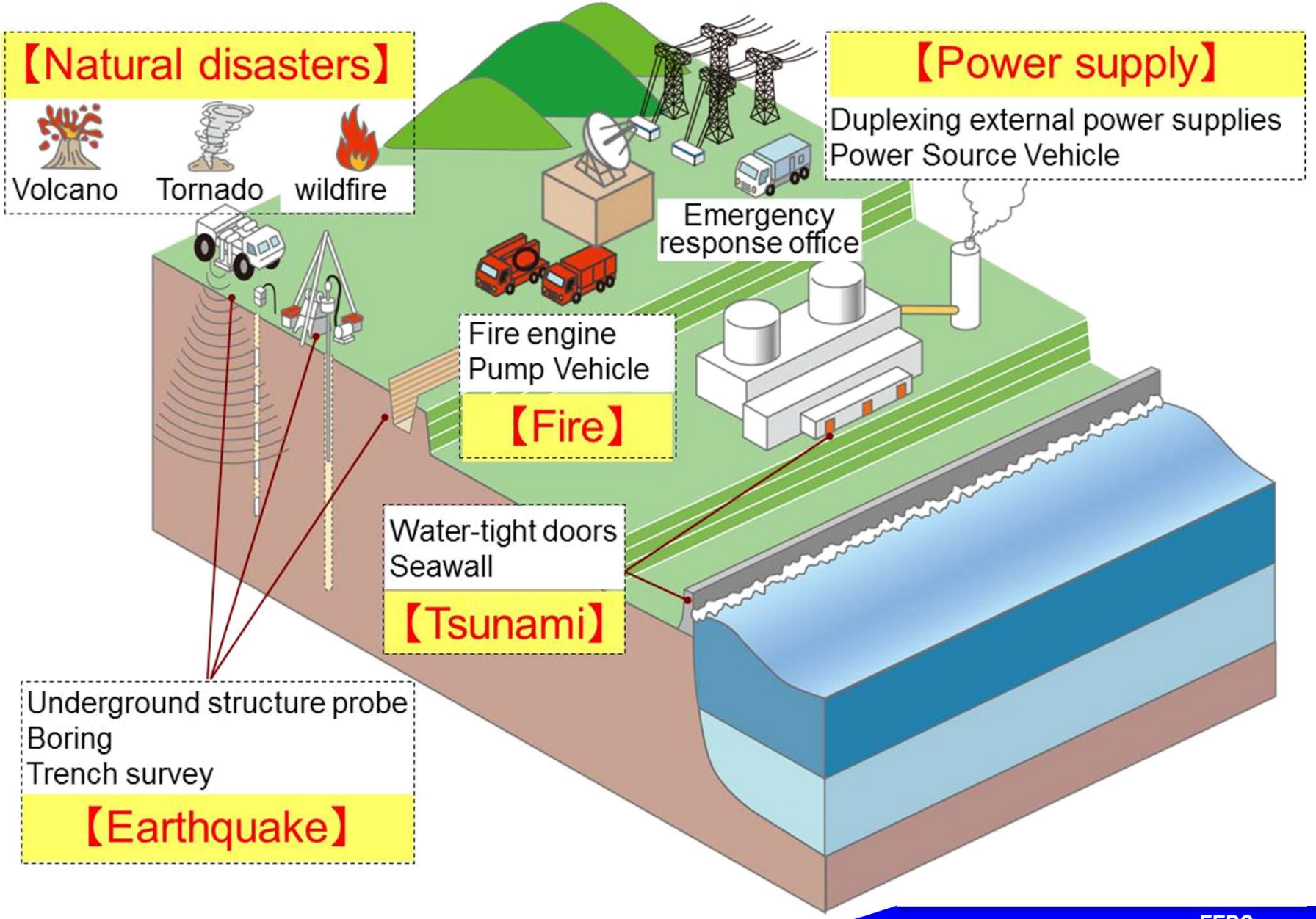
(4) Reinforce Safety Culture

(5) Strengthening Nuclear Risk Management

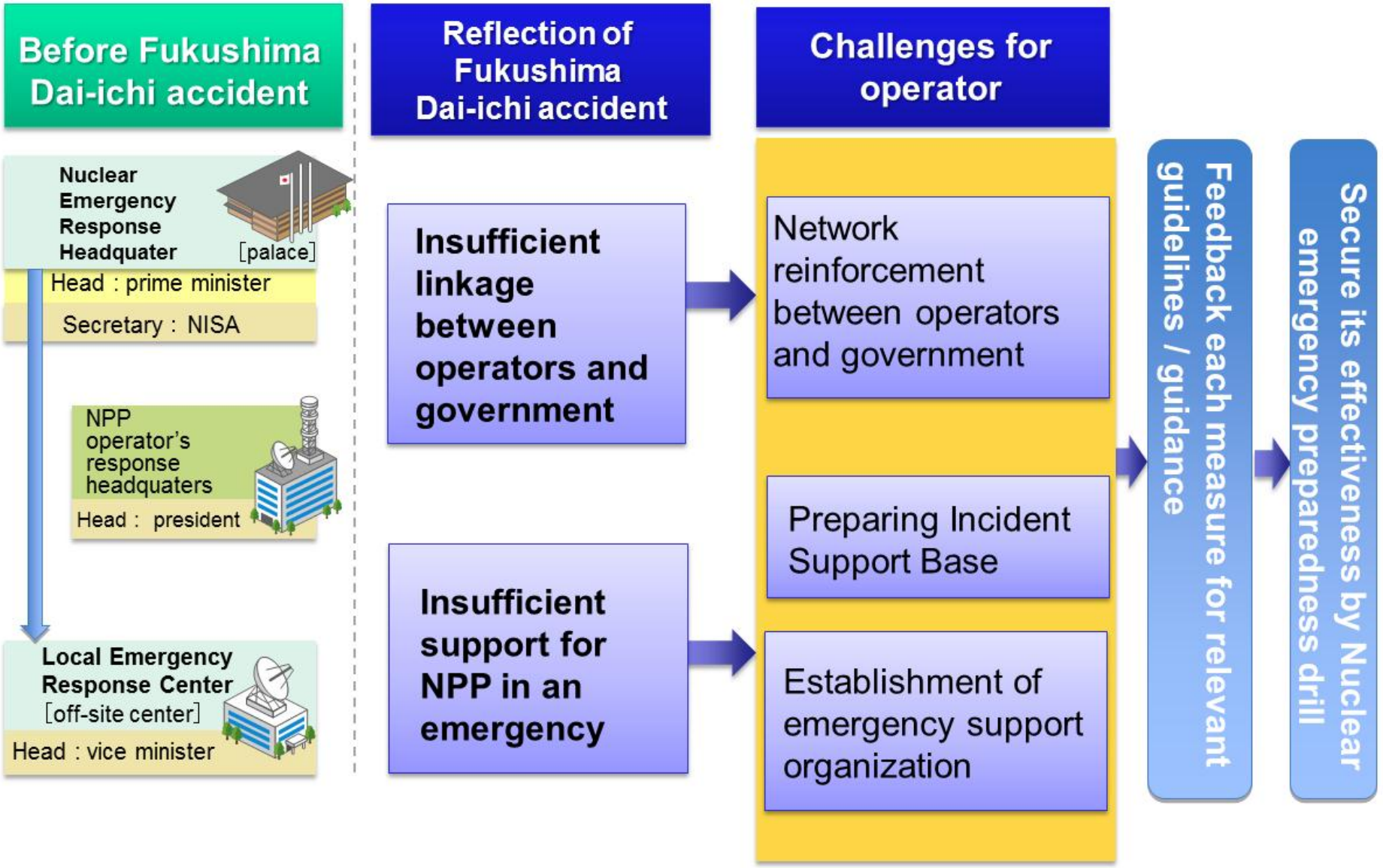
(1) Pursuit of the world's highest level of nuclear safety



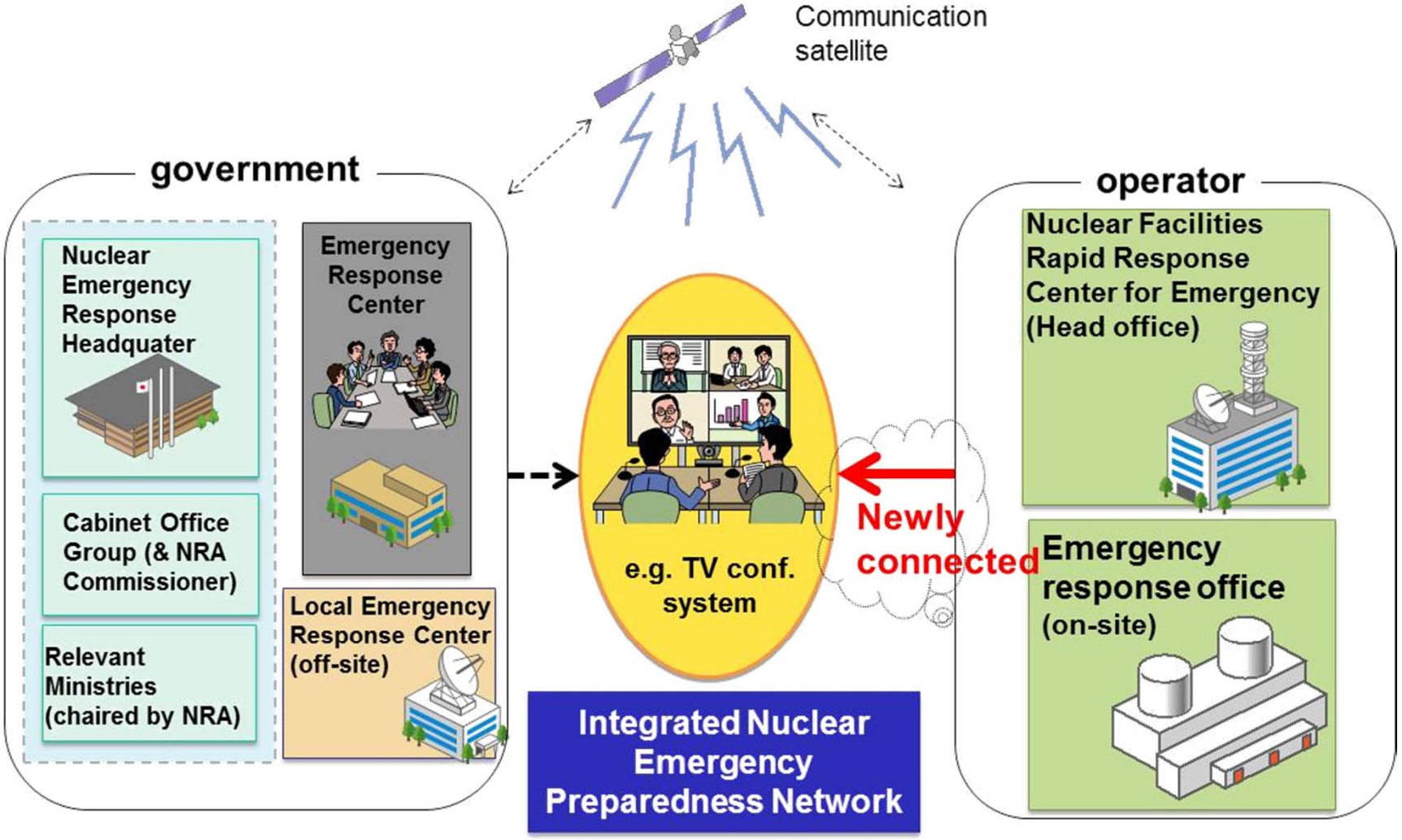
(2) Measures for safety improvement



(3)-1 Improvement of nuclear emergency preparedness



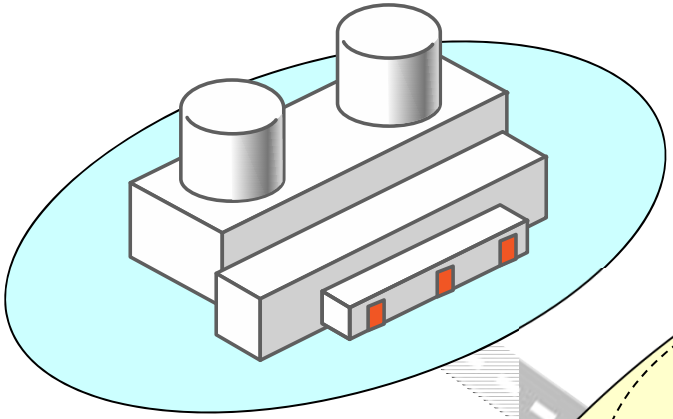
(3)-2 Network reinforcement between operators and government



Connected Satellite Channel besides Terrestrial Channel (Multiple Channel)

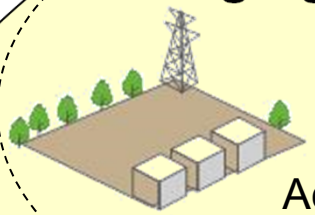
(3)-3 Preparing incident support base

【NPP in an emergency】



【 Incident Support Base 】

Staging facility



Actual working unit
（Self Defense Force / firemen）

Center facility

Equipment and materials

heliport

H

Support facility

Operators’ support（Other utilities / support organization）

harbor

(3)-4 Nuclear emergency support organization

- Co-established by utilities to support NPP's emergency response in an accident.
- Equipped with remote-control robots and decontamination equipment and conduct training of the NPP personnel.
- Deliver equipment and personnel to the NPP in an emergency and support them.

Japan-Nuclear Emergency Assistance Center

"J-NEACE" was established in Fukui pref. in Jan. 2013.

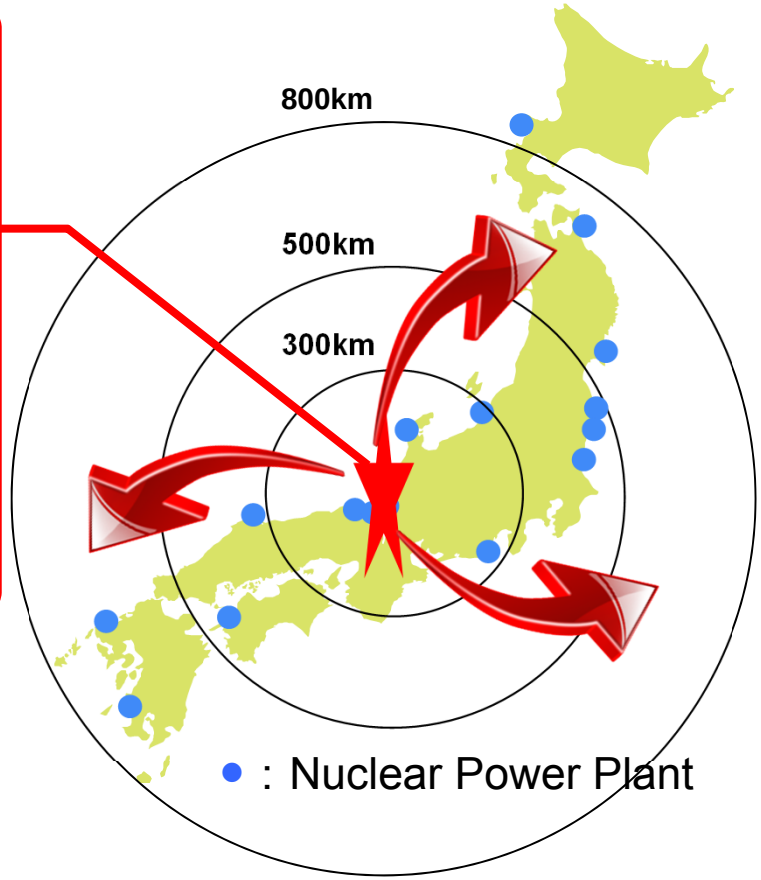
- At Call 24hr/365days
- Operator Training
- Maintenance & improvement of equipment

Training of Robot Manipulation

SOS !!

Respond to an emergency call

NPP in an Emergency



(3)-5 Nuclear emergency preparedness drill

- The government, local public organizations, designated public institutions, and nuclear operators are coordinating to have comprehensive drill based on examination of the Fukushima Daiichi NPP accident and the lessons learned from it.
- Operators implement comprehensive drill one to three times a year (Operators conducted approximately 30 drills in FY2013.)

Drill overview

○Scenario: Large scale nuclear disaster
（Discharge of radioactive material）

○Content (primary training agenda):
- ・Notification
- ・Monitoring during emergencies
- ・Evacuation
- ・Interaction with nuclear emergency support organizations
- ・Accident escalation prevention (emergency measures)
- ・Exposure treatment during emergencies

○Participants: Approx. several hundred to 2000 and several hundred people
（The number of participants differs depending on the participating agencies）

at the nuclear emergency response headquarter

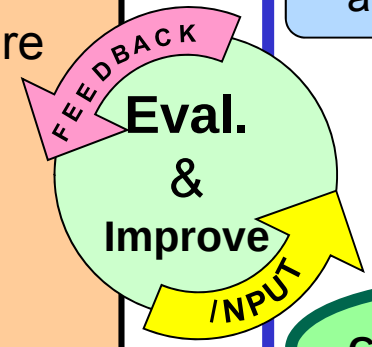
Emergency exposure medical treatment training (evac by helicopter)

(4)-1 Reinforce safety culture (Kansai Electric Power)

CEO's declaration : "Ensuring safety. It is my mission. It is our mission."

Quality Policy

- Give the highest priority to safety
- Invest resources readily to secure safety
- Improve the nuclear safety continuously, and strengthen collaboration with vendors and subcontractors
- Strive to regain the trust of society
- Evaluate activities for securing safety objectively and inform the results to the public



Safety Culture Assessment

I. Assessment of consciousness and actions of an organization and a person

Commitment of the top management

Three pillars of safety culture

Communication

Learning organization

II. Assessment of the results of safety

III. External assessment

(4)-2 The three pillars of safety culture

Commitment of the top management

- Prioritizing safety above all else
- Clarification of organizational authority and responsibility
- Understanding and preforming based on the sense of values of top management
- Appropriate use and distribution of resources

【To be explained today】
Efforts by entire power industry

Learning organization

- Questioning attitude and the ability to detect risk across the entire organization
- Proactive problem resolution based on troubles
- Compliance and revise the rule to improve
- Proactive gathering of external opinions and incorporation of those opinions
- Maintaining technical ability by passing on know-how

【To be explained today】
Efforts by entire power industry

Communication

- Good coordination and communication internally and between organizations
- Providing information to external parties in a timely and easy-to-understand manner

(4)-3 Initiatives for promoting the world's highest level

- Establishment of JANSI -

Commitment of the top management

Establishment of JANSI and its philosophy

Utilities CEOs' sense of urgency;
"If JANSI does not function, Japan's nuclear power can not be continued."

On November 15, 2012, JANSI was established modeling after INPO
Mission: Pursuit the world's highest level of safety in Japan's nuclear power industry
--Untiring Pursuit of the Highest Standards of Excellence

Initiatives of JANSI

Efforts to achieve the mission

- (1) Assessments, proposals/recommendations, and support for safety improvement measures
- (2) Assessments, proposals/recommendations, and support for nuclear power facilities
- (3) Basic work to support the initiatives

Method of achieving the mission

- Ensuring independence
- Commitment of operator presidents
- Coordination with overseas agencies

(4)-4 JANSI's activities to improve safety

Learning organization

【Safety improvement measures】

- Recommendation to construct a system for ensuring safety in consideration of risk
- Incorporating the lessons learned from the Fukushima Dai-ichi accident
  - Analysis of various reports
  - Confirmation of status of operators' actions reflecting lessons learned
- Operators' severe accident countermeasure assessment

【Nuclear power facility reviews】

- Peer reviews
  - At four power stations
  - Equivalency with WANO peer reviews being assessed
  - Participation in WANO peer reviews in Japan
- Newly-created counterparts for each plant manager

【Basic Works】

- Promoting safety culture (assessment, caravans)
- Data analysis (operating experience)
- Support for develop of commercial standards
- Personal development (from executives to field managers)

(4)-5 Commitment of top management to JANSI

Commitment of the top management

Operator Presidents meeting

Four times a year all operator presidents gather to discuss nuclear safety

- **JANSI executive training (Presidents opinion exchange meeting)**

  Topic 1: “Direct causes of the Fukushima Dai-ichi accident”

  Topic 2: “Organization culture of TEPCO”

  Topic 3: “Response of each nuclear power operator”

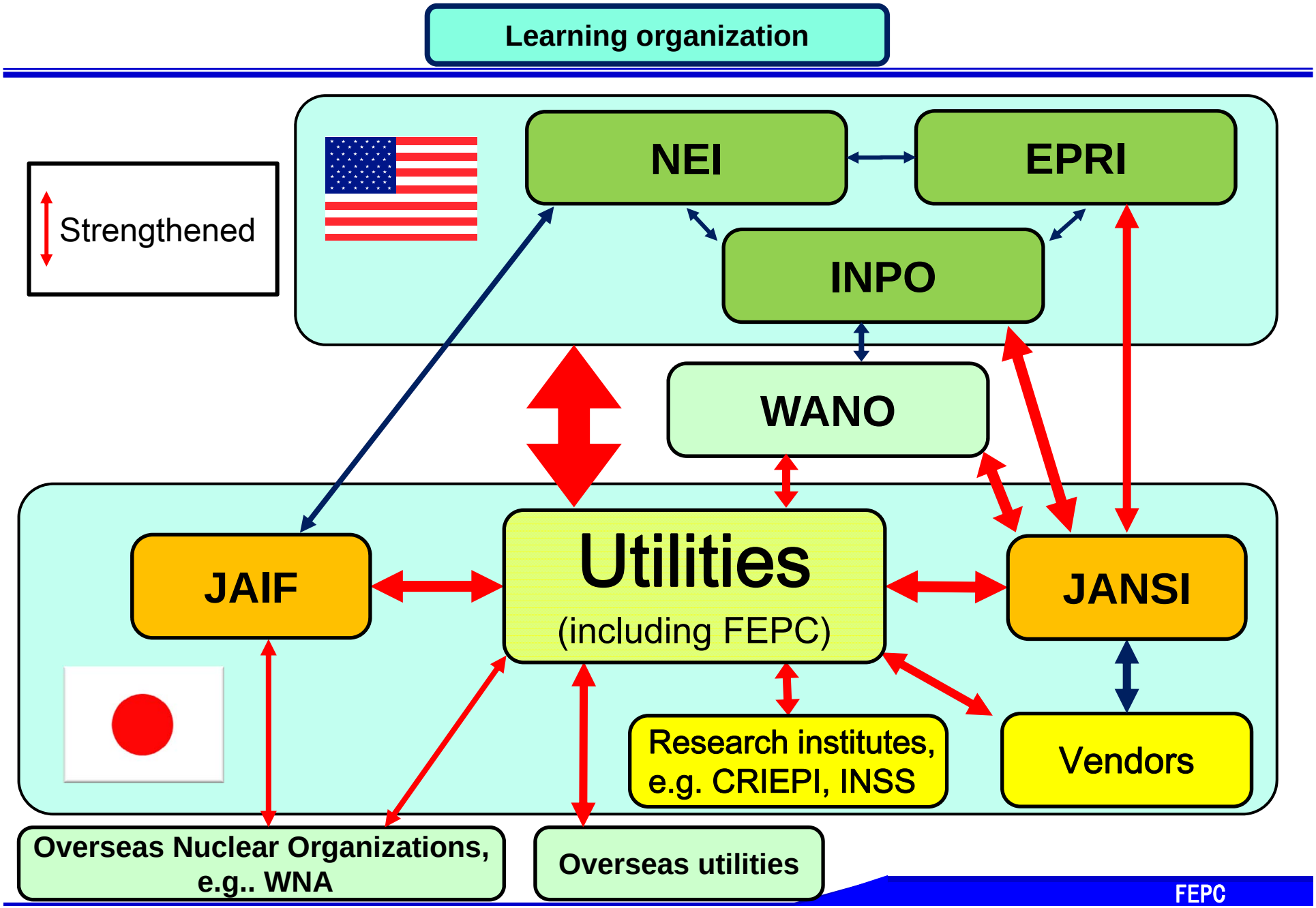
Photos from third meeting
（Facilitator: Dale Klein, former NRC chairman)

- **Peer review result reporting and improvement measures**
  - President is reported peer review result directly by JANSI, and introduce it to other presidents
  - Reinforce coordination between JANSI and WANO
- **Nuclear safety risk management measures**
  - JANSI recommends to construc a system for ensuring safety in consideration of risk

（Recommendations）

- ✓ Declaration of commitment by executives
- ✓ Establishment of dedicated risk management (including PRA) department
- ✓ Promoting a culture that is aware of risk

(4)-6 Reinforcement of collaboration with overseas organizations



(4)-5 Examples of exchanging information and strengthening collaboration (INPO, WANO)

Commitment of the top management **Learning organization**

Participation in INPO Board of Directors meeting (September 2013: FEPC Chairman)

- Strengthening collaboration with Japan and asking for assistance
- INPO's expectations for the leadership in Japan to restore trust

Visit to INPO by FEPC chairman

Participation in WANO activities

- FEPC chairman promotes activities to strengthen WANO as a representative of the industry
- All presidents in Japan will be directors of the WANO Tokyo center
- Holding of CEO conference (participation by presidents of all power companies and JANSI)

WANO CEO conference (Osaka)

US-Japan CNO opinion exchange meeting (to be continually held)

（Sept. 2013: 10 Japanese CNOs and 28 US CNOs)

- The roles of NEI and INPO in improving safety
- Status of efforts in Japan and US after Fukushima Dai-ichi accident
- Contaminated water problems at the Fukushima Dai-ichi

US-Japan CNO opinion exchange meeting

(4)-6 Examples of exchanging information and strengthening collaboration (EPRI, NEI)

Commitment of the top management | **Learning organization**

Participation in EPRI activities

Electric power operators

Participation by all companies via JANSI

Full membership (5 companies)
(prior to disaster: 2 companies)

Risk and safety management program
(PRA technology introduction)

- **research results**
- **training**
- **workshops**
- **seminars**
- **engineer network**
- **engineering information**

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Sharing information with NEI

- The FEPC chairman visited the US and exchanged opinions with the chairman of the NEI with regards to restoring trust in nuclear power
- The importance of “accumulating a high level of technical knowledge” and “consistent communication plans” (one voice) as NEI success factors was shown.

NEI NUCLEAR ENERGY INSTITUTE FEPC The Federation of Electric Power Companies of Japan.

(5)-1 Strengthening nuclear risk management

Risk management before the accident (e.g. Kansai EPC)

- In-house Risk Management Committee
- Individual department conducts risk management
- "Radiation release" risk was identified as an important risk

< Third-party's opinions >

- METI-WG discussing Voluntary Nuclear Safety Improvement
- JANSI proposals on risk management

However…

Shortfalls in sensitivity to the nuclear risk might be revealed by Fukushima dai-ichi accident

Efforts to strengthen nuclear risk management

Strengthening points

(1) Correct risk awareness as a management issue
(2) Leveraging dedicated technology for reducing risk
(3) Learning attitude from both within Japan and abroad
(4) Engaging in safety research while looking at the whole picture
(5) Promoting safety improvement activities that transcend regulatory frameworks
(6) Strengthening the use of PRA
(7) Shared risk awareness with stakeholders

(5)-2 Risk management strengthening points (1/2)

Strengthening points	Entire industry	Individual companies
(1) Correct risk awareness as a management issue	Mechanism for warning about risk from third party perspective	Mechanism for recognizing risk information and handling it as a management issue 【KEPCO example】 Organization development/staff enhancement, deployment of personnel that can view the whole picture
(2) Leveraging dedicated technology for reducing risk	Efforts toward solving problems by deliberating technology including probabilistic methods, and R&D	–
(3) Learning attitude from both within Japan and abroad	Function for gathering and accumulating knowledge	Function for increasing sensitivity to knowledge 【KEPCO example】 Organization development/staff enhancement, deployment of personnel that can view the whole picture
(4) Engaging in safety research while looking at the whole picture	Function for coordinating safety research	–

(5)-3 Risk management strengthening points (2/2)

Strengthening points	Entire industry	Individual companies
(5) Promoting safety improvement activities that transcend regulatory frameworks	Efforts toward promoting and confirming the activities of each company	Promotion mechanism 【KEPCO example】 Organizational development/staff enhancement
(6) Strengthening the use of PRA	Efforts toward promoting use, such as the improvement of PRA	PRA method development/enhancement 【KEPCO example】 PRA application acceleration/personal cultivation
(7) Shared risk awareness with stakeholders	Investigating and deliberating risk communication methods	Engaging in risk communication, leveraging risk information 【KEPCO example】 Risk communication enhancement, deliberation and incorporation in evacuation plans based on PRA results

Entire industry efforts:

Industry examines and will present as early as possible in FY2014

Individual company efforts:

Each company will disclose details of plan and schedule independently

4. Conclusions

Conclusions

- Nuclear power will continue to be an important power source for the future and facilities for which safety has been confirmed should be utilized.
- Operators continue to make sincere efforts to restart of NPPs operation
- Operators make efforts to restore public trust in nuclear power
  - Pursue the world's highest level of safety as our fundamental responsibility to ensure safety
  - As a self-regulating organization JANSI shall guide further safety improvements
  - Continue to conduct drills to keep effectiveness of nuclear emergency preparedness measures
  - Have been reinforcing safety culture
  - Enhance nuclear risk management

Thank you for your attention