



Support for the Emergency Preparedness of Nuclear Facilities

April, 2018

Japan Nuclear Safety Institute



JANSI' s Mission

Pursue the world's highest level of safety in Japan's nuclear industry

~Untiring pursuit of the highest standards of Excellence~

Initiatives for fulfilling the mission (related to nuclear emergency preparedness)

○Assessments, proposals and/or recommendations, and support for safety improvement measures

- Assessment of severe accident measures

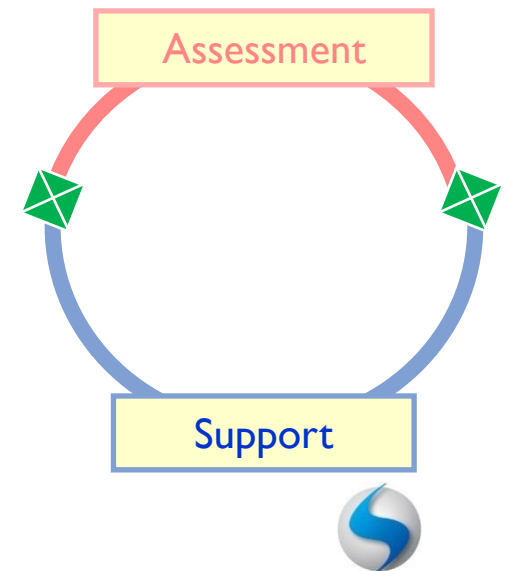
○Assessments, proposals and/or recommendations, and support for nuclear power facilities

- Assessment by peer reviews
- "EP" (Emergency Preparedness) is one of the review areas

○Basic work to support utilities and JANSI's initiative

- Personnel development
(support to improve the ability of emergency response personnel)
- Information analysis
- Developing guidelines

Cycle of **assessment** and **support**



Importance of Nuclear Emergency Preparedness Training

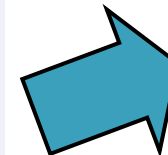
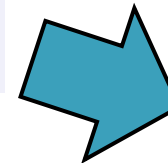
Since the Fukushima Daiichi accident, nuclear emergency preparedness has been under review and restructured in view of the lessons learned from the accident and international standards, e.g. IAEA standards.

Utilities are upgrading emergency response facilities, equipment, and procedures, including the "Nuclear Utilities' Emergency Preparedness Programs" to deal with complex disasters and severe accidents.



- Emergency response cannot be experienced in a practical sense.
- Emergency response facilities and equipment are rarely used.

- Improve the level of skills to ensure that every activity elements will function, including the fundamentals based on emergency response plans.
- Improve the ability to make judgments and apply skills so that even unforeseen circumstances can be dealt with.



Training is important.



Support for Nuclear Emergency Preparedness

Support for Nuclear Emergency Preparedness Training

1. Providing support to ensure the effectiveness of emergency response training
 - Establishing the “Nuclear Emergency Preparedness Training Guideline”
2. Providing support to improve emergency response activities
 - Establishing and managing the “Nuclear Emergency Preparedness Training Study Committee”
3. Providing support to improve the ability of emergency response personnel
 - Organizing workshops and seminars, and reporting findings



JANSI's "Nuclear Emergency Preparedness Training Guideline" (1/2)

[Background]

- Following the Fukushima Daiichi accident, the importance of daily preparedness for nuclear emergencies, including complex disasters involving earthquakes and tsunami, simultaneous accidents at multiple units, and terrorist attacks, has been re-acknowledged. More effective nuclear emergency preparedness training is required more than ever.

In April 2012, the “Nuclear Emergency Preparedness Training Guideline Study Committee” consisting of members equipped with expertise in nuclear emergency preparedness, was established to have energetic deliberations.



JANSI's "Nuclear Emergency Preparedness Training Guideline" was established (January 2013)

<http://www.genanshin.jp/archive/disasterprevention/index.html>

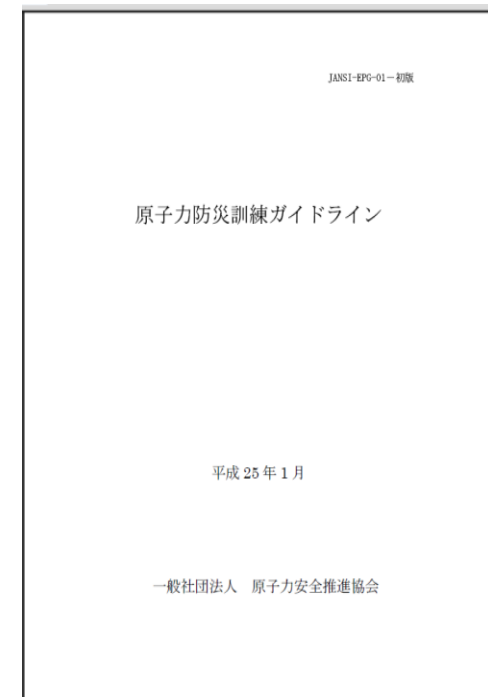


JANSI's "Nuclear Emergency Preparedness Training Guideline" (2/2)

To show the procedures and rules for utilities to conduct training on emergency response activities, including nuclear emergency preparedness, in an independent and effective manner.

[Contents]

- Providing basic matters that are helpful in planning and implementing nuclear emergency preparedness training (ideas and procedures about the process of planning, implementing, reviewing, and improving training)
- Providing procedures about non-scripted training which is thought to be effective in improving the ability to make judgments and apply skills



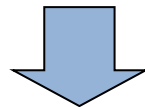
Nuclear Emergency Preparedness Training Study Committee (1/6)

The “Nuclear Emergency Preparedness Training Study Committee” has been established to provide support so that nuclear emergency preparedness training conducted by nuclear utilities will be more effective.

[Purport of Establishment]

Nuclear utilities have started their initiatives to work out more effective training in reference to the "Nuclear Emergency Training Guideline."

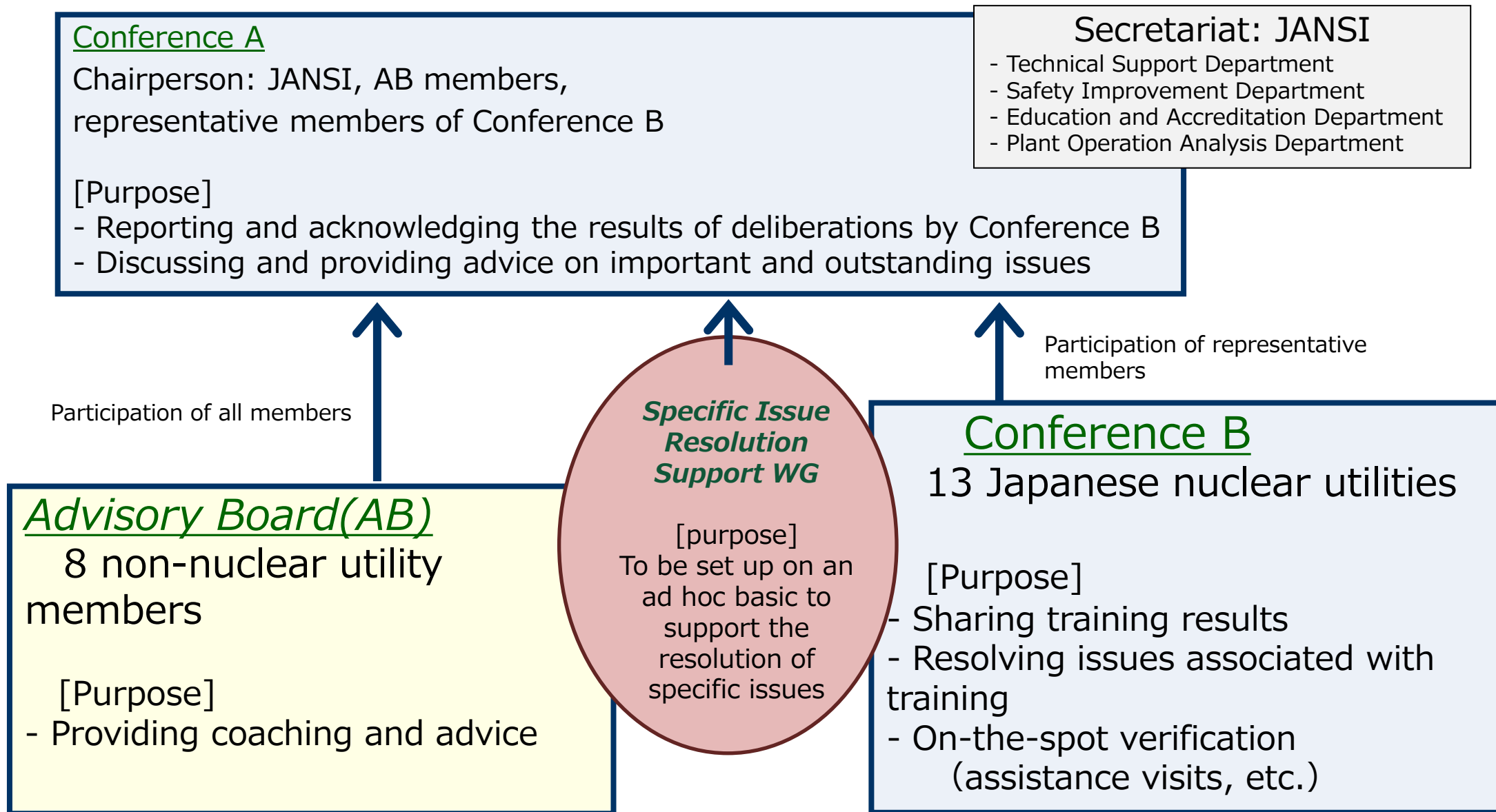
- JANSI is responsible to **monitor the use of the Guideline by utilities, enhance its details, and develop it into one that is more useful and helpful to utilities.**
- JANSI is also responsible to **provide appropriate coaching and advice, support, and encouragement for utilities' initiatives by introducing domestic and overseas practices and through the eyes of outsiders.**



As a mechanism to fulfill these responsibilities, the “Nuclear Emergency Preparedness Training Study Committee” was established in May 2013 with utilities and members of the “Nuclear Emergency Preparedness Guideline Study Committee serving” as key members.



Nuclear Emergency Preparedness Training Study Committee (2/6)



Nuclear Emergency Preparedness Training Study Committee (3/6)

- Nuclear Emergency Preparedness Training Study Committee (Conference A)

(1) June 2013, (2) Dec. 2013, (3) Sept. 2014, (4) Apr. 2015, (5) Nov. 2015, (6) Apr. 2016, (7) Dec. 2016, (8) March 2017, **(9) July 2017, (10) Dec. 2017, (11) March 2018**

- Nuclear Emergency Preparedness Training Study Committee (Conference B)

(1) Aug. 2013, (2) Nov. 2013, (3) Apr. 2014, (4) Feb. 2015, (5) July 2015, (6) Feb. 2016, (7) Nov. 2016, (8) March 2017, **(9) July 2017, (10) Dec. 2017, (11) Feb. 2018**

- Emergency Preparedness Training presentation

(1) 31st July-1st Aug. 2013, (2) 17th-18th June 2014, (3) 2nd-3rd June 2015, (4) 17th-18th May 2016
(5) 23rd-24th May 2017

Each company made a presentation on the conduct of training. Working-level personnel got together from all Japanese nuclear power stations to share good practices of other power stations and find clues to solve their own issues through earnest presentation and enthusiastic questions and answers.

Advanced initiatives

- Introduction of ICS (Incident Command System)
- Information sharing tool templates
- Emergency database
- Use of SPDS information for training

Emergency preparedness training presentation



Nuclear Emergency Preparedness Training Study Committee (4/6)

◇ Emergency Preparedness Training Assistance Visits

Providing utilities with support for their initiatives to improve safety without limiting to meeting regulatory requirements

Conducting emergency preparedness training assistance visits

- Higashi dori Nuclear Power Plant: May - August 2014
- Shimane Nuclear Power Plant: December 2014 - March 2015
- Hamaoka Nuclear Power Plant: June - August 2015
- Tsuruga Nuclear Power Plant: December 2015 - February 2016
- Shika Nuclear Power Plant : July - October 2016
- **Onagawa Nuclear Power Plant : August - November 2017**



Training to ERO at the emergency response center



Nuclear Emergency Preparedness Training Study Committee (5/6)

◇Emergency preparedness training assistance visits

The following activities that are carried out by **the Assistance Visit Team ("Team") formed by the Nuclear Emergency Preparedness Training Study Committee** established in the Japan Nuclear Safety Institute to help ensure and improve the effectiveness of nuclear emergency preparedness training conducted by nuclear utilities:

- Identifying concerns and challenges in the process of developing effective training plans **in reference to JANSI's Nuclear Emergency Preparedness Training Guideline** and provide advice for ensuring the PDCA cycle of training
- Providing counseling discerning cases in which utilities are at a loss in the approach or taking misguided initiatives in the activities to improve the effectiveness of nuclear emergency preparedness training
- Sharing the information gained through these activities among utilities to help other plants improve the effectiveness of nuclear emergency preparedness training



Nuclear Emergency Preparedness Training Study Committee (6/6)

◇Features of emergency preparedness training assistance visits

- Based on the idea that the key to the success of training is a setup (training plan), the Team will review from the planning stage.
- The Team's observations in the planning stage will be reflected into the training plan, if possible, by the reviewed plant to enhance the training plan.
- The Team consists of peer personnel engaging in emergency preparedness and response, emergency preparedness and response experts from academia or other industries, and JANSI's personnel concerned with emergency preparedness and response.
- Peer reviewers can grasp the "strengths" and "weaknesses" of their own plants by observing the practices of other plants and comparing them with theirs.
- It is expected that peer reviewers can improve their review skills by acting as team members to "review training" although their "training is reviewed" while they are at their own plants.



Nuclear Emergency Preparedness Training Seminars (1/3)

Seminars and trainings in 2014-

	Education Contents (examples)		Controller	Director (team reader)	Team Member
Knowledge / skills	Basic	<ul style="list-style-type: none"> -Laws /Regulations -Organization /Function -Role -Equipment -Device -Radiation <ul style="list-style-type: none"> • Knowledge on Emergency Response Organizations and EP Activities • Knowledge on Facilities and Equipment for radiative material transportation package • Knowledge on Radiation Protection • Methods for Radiation Measurements • Knowledge on Necessary Equipment related to EP • Basic Knowledge on SA • Basic Knowledge on Accident Management • International and National Cases 			
	Advanced	<ul style="list-style-type: none"> • Specialized Field of each team Specific Equipment/Device (For example, DGs and Power Supply Cars for Electricity Maintenance Division) • SAM taken Fukushima Accident into Account • SA Analyses / Analysis Codes • SA Phenomena • Prevention and Mitigation of SA 			
Attitude		<ul style="list-style-type: none"> • understanding situations / making decision 			

Seminar on Non-scripted Drills and Exercise : 25th-26th Feb. 2014

Seminar on EP Excellence : 3rd-5th Mar. 2015

#5 Seminar and Lecture on EP : 21st Feb. 2018

#1 Seminar and Lecture on EP : 31st Oct. 2014

Training for Directors at Emergency Response Center: 27th-28th Feb. 2014

Nuclear Emergency Preparedness Training Seminars (2/3)

Seminar on Non-scripted Drills and Exercise : Feb. 25-26, 2014
Inviting speakers from nuclear power plants in the US

- To understand on **Non-scripted Drills and Exercise**, spread the knowledge and skills for the introduction and the implementation, and develop technicians who will play key roles in EP training in the future

(Contents)

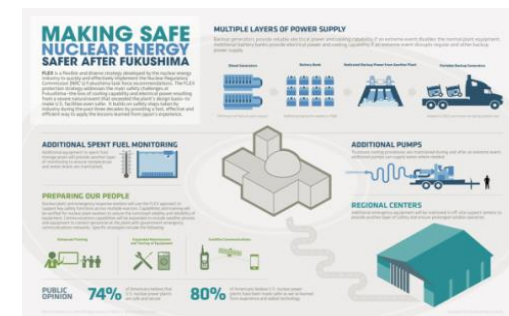
- Planning of Drills and Exercise
- Drill and Exercise, Development Processes
- Scenario Development
- Drill and Exercise Execution - Scenario Control
- Control and Evaluation of Drills and Exercises
- Exercise Critique, Process and Reports



Nuclear Emergency Preparedness Training Seminars (3/3)

Researching abroad cases, and providing information with JANSI's members

- Visiting a nuclear plant in the US (Oct., 2013)
 - observing EP training(drill) on severe accidents
 - discussing issues related to EP
- Publishing a report, "Insights of Advanced Cases on Severe Accident Management Training, Vol. 1" (Dec., 2013)
- Researching severe accident managements and emergency preparedness on power stations in Europe (Oct., 2015)
 - investigating safety measures on power stations in Sweden and in Switzerland
- Visiting the Canadian power station to observe EP exercise (Oct., 2017)



EP Training of utilities (1/2)

Drills in light of the Fukushima Daiichi NPS accident (severe accident drill)



Drills securing water source using alternate water injection cars (portable pump) and fire-engines (Tohoku Electric Power website)



Drills for injecting water to reactors/spent fuel pools (Tokyo Electric Power website)



Drills securing power by power supply cars (Japan Atomic Power Company website)



Drills opening valves used in containment vessel vents (Chubu Electric Power website)



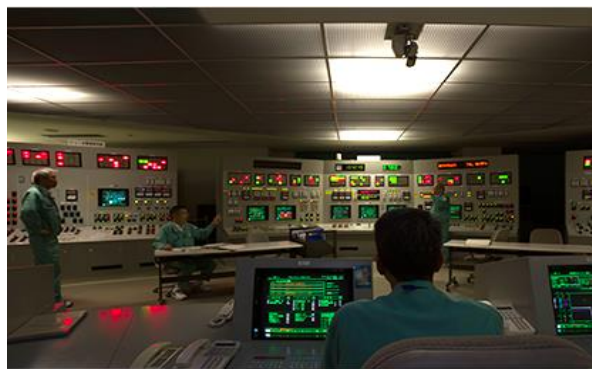
Drills feeding water to steam generators (Kansai Electric Power website)

EP Training of utilities (2/2)

Drills assuming various situations



Debris removal drills
(Chubu Electric Power website)



Operation drills by simulators,
assuming station blackouts
(Shikoku Electric Power website)



Drills transporting tools/equipment
by helicopters
(Kansai Electric Power website)



Remote-control robot drills at the nuclear emergency support center

