

## Press Release

# Preparations for Establishment of Nuclear Risk Research Center to Support Sustained Commitment to Reduce Nuclear Risk

- (1) To serve as a nucleus for research and development necessary for utilities to improve safety on their own initiative
- (2) To actively utilize probabilistic risk assessments (PRA), as such methods are useful for reducing risk by shedding light on events that, although low frequency, have the potential to inflict heavy damage, and for formulating countermeasures
- (3) To formulate a “Research and Development Roadmap,” and effectively promote research and development by applying PDCA, which extends to utilization of R&D results

June 13, 2014

Central Research Institute of Electric Power Industry (CRIEPI)

The Central Research Institute of Electric Power Industry (CRIEPI) (President: Masahiro Kakumu; Head Office: Chiyoda-ku, Tokyo) has **decided to establish the Nuclear Risk Research Center in the first half of the current fiscal year, and will proceed with the necessary preparations.**

(1) In the aftermath of the accident at Fukushima Daiichi Nuclear Power Station, CRIEPI formed the Nuclear Power Plant Safety Research Team in July 2012, which was comprised of approximately 90 researchers in nuclear safety-related fields. This team assembled information, formulated a comprehensive strategy, and conducted research and development to effectively achieve results useful in enhancing safety. During this time, subsequent to the emergency safety measures immediately after the accident, utilities implemented additional safety improvement measures at power stations in response to new regulatory requirements enacted by the Nuclear Regulation Authority in July 2013. CRIEPI results were also used to a considerable extent in that context.

Yet, in the course of these processes, there was once again an acute awareness among all that it is vital to continually strive for even higher levels of safety in the use of nuclear power generation. To that end, **utilities must not limit themselves to the requirements of the regulatory framework alone, but must work to reduce risks on their own initiative.** As an additional outcome, the challenges faced in research and development necessary for reducing risks came to be more clearly defined.

To enable CRIEPI to serve as a center for finding solutions to such issues, we therefore decided to further reinforce the system for research by the special research team and establish the Nuclear Risk Research Center in the first half of the current fiscal year. The Center will serve to **promote research**

**and development through stronger collaboration and cooperation with relevant organizations both inside and outside Japan.**

- (2) In light of the Fukushima Daiichi Nuclear Power Station accident, the most important challenge faced in reducing risks is to lower the probability of an accident arising. This will be accomplished by implementing appropriate measures to counter natural disasters involving large earthquakes, massive tsunamis, and tornados as well as other events that are low frequency, yet have the potential to cause significant damage. Similarly important are measures to mitigate any damage if an accident does occur.

To that end, it is important that, on the basis of collection, experiments, analyses and other investigation of past data, we further intensify our efforts to **elucidate the mechanisms through which such events occur, precisely predict the progression and behavior of accidents at power stations** that have been caused by such events, and formulate countermeasures. Moreover, because the focus is on **events that are low frequency and involve substantial uncertainty**, it is necessary to verify the effectiveness of measures based on **comprehensive risk assessments utilizing PRA and other probabilistic methods**.

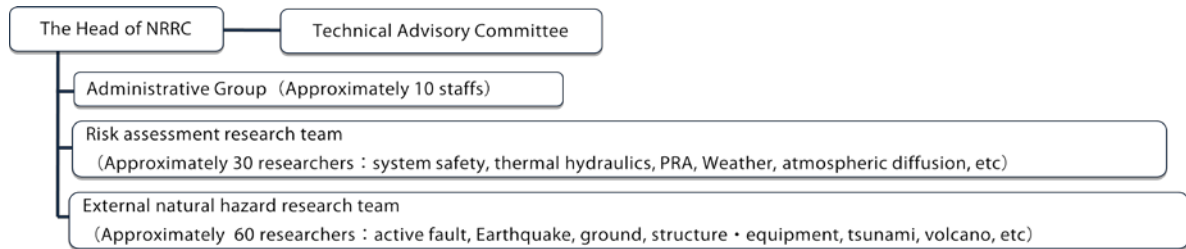
The Center will focus on research and development to acquire technology and know-how that will be used in these activities.

- (3) Reducing risks associated with low frequency events is no easy task. The Center will therefore **draft the Research and Development Roadmap** with a view toward applying our results to the field and reflecting them in specific efforts such as standardization. The roadmap will expressly indicate the order in which challenges will be prioritized, specifying what is to be achieved and the timings involved. Then, based on this roadmap, the Center will **marshal the wisdom of relevant organizations and generate a cycle combining research and development with utilization of results**, so as to contribute steadily and reliably to attaining ever higher levels of safety.

A Technical Advisory Committee, to be comprised of experts from both inside and outside Japan, will be set up to secure scientific objectivity in the operation of the Center by reviewing research plans, as well as research results and the extent to which they are utilized, and by providing guidance and advice.

## ■ Outline of the Organization

- Name : Nuclear Risk Research Center
- Scheduled date of establishment : In the first half of PY 2014
- Location : Central Research Institute of Electric Power Industry, Otemachi (Chiyoda-ku, Tokyo)  
 (Research activities will be conducted mainly in Abiko and Komae)
- The number of members : Approximately 100 (including members who have two posts)



## ■ Main Functions

- Research & Development
  - (1) Pick up technical issues and formulate the roadmap for research and development
  - (2) Clarify mechanisms of low-frequent event and behaviors of power plant
  - (3) Risk assessment, make measures, consider risk communication method
  - (4) Coordinate the safety research with related organizations
- Reflection of Research Results
  - (1) Technical supports for result application of specific activity for risk reduction by utilities
  - (2) Confirm the state of reflection of the results, and promote application of the results  
 (collaborating with Japan Nuclear Safety Institute (JANSI))
  - (3) Send information and conduct dialogue about Research results and so on.

## ■ Main Research and Expected Results

Category	Research Theme
Active fault, Seismic	Seismic activity of fault • judging method of possibility of simultaneous rupture, diffuse seismicity and impact evaluation etc
Tsunami	Tsunami Scale • impact assessment, protection measures etc
Other external events	Tornado scale • impact assessment, volcano eruption scale • impact assessment, protection measure etc
Inner fire	Volcano impact evaluation method, protection measure etc
Inner overflow	Rapture-postulation of high energy piping etc
PRA technology	Development of PRA method for external natural hazards, human reliability evaluation method etc
PRA application	Prevention of each accident • evaluation of impact mitigation effectiveness, risk management method etc

Term	Expected Results
Short term (1-2 years)	<ul style="list-style-type: none"> <li>• Development of evaluation method for seismic activity of fault (absolute dating, simultaneous rupture)</li> <li>• Development of formulating method for standard seismic motion (Diffuse seismicity, 3D sub surface structure)</li> <li>• Refining tsunami scale evaluation (Tsunami deposit), development of wave impact evaluation (wave power, impact)</li> </ul>
Medium Term (In 3-5 years)	<ul style="list-style-type: none"> <li>• Development of plant parameters evaluation method for PRA</li> <li>• Fault displacement prediction and development of facility impact evaluation method, draft protection measure</li> <li>• Development of risk evaluation methods for inner fire, inner overflow, tornado, volcano</li> <li>• Development of Seismic-Tsunami PRA evaluation method</li> </ul>
Medium- Long Term (5-10 years)	<ul style="list-style-type: none"> <li>• Proposal for development of seismic performance evaluation method (displacement evaluation for ground and slope, elastic-plastic evaluation for instrumentation)</li> <li>• sites where many plants locate, development of risk assessment method for compound external hazard</li> </ul>
Continuous working	<ul style="list-style-type: none"> <li>• Proposal for improvement based on application of risk information</li> </ul>



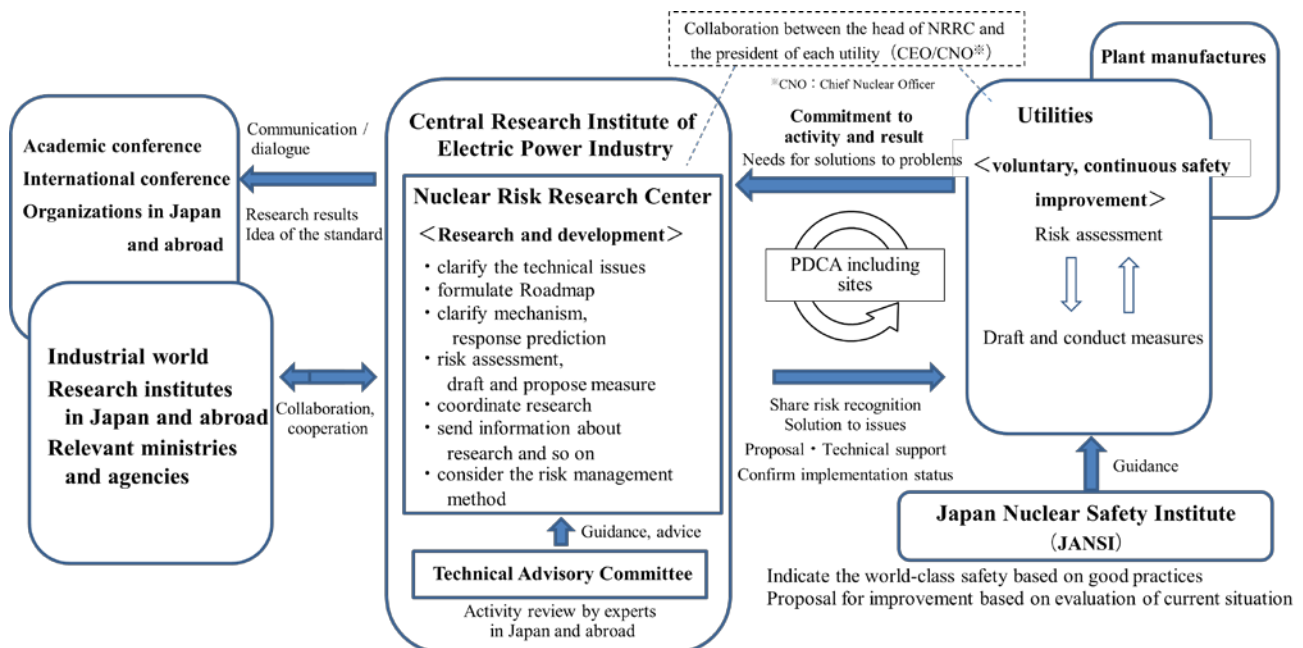
A look of investigation of active fault, and Sample analysis with X-ray computed tomography scanner



The whole view of Tsunami physical simulator And breakwater overflows experimentation



## Relationship with Other Organizations



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<Explanation of Technical Word>

※<sup>1</sup> 「PRA : Probabilistic Risk Assessment」 :

Probabilistic Risk Assessment is a method to show the degree of safety by making a comparison of “Risk”. The “Risk” is calculated by multiplying frequency and impact of an event which are evaluated quantitatively in consideration of every possible accident in nuclear facilities.

For inquiries, please contact us here

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