

SPECIFICATIONS

1. Subject Matter

Research on Nuclear Regulatory Trends and Nuclear Power Trends in the United States, Europe and other countries in FY2015

2. Objectives

On March 11, 2011, following the great earthquake that struck the Pacific coast of Tohoku region in Japan, Fukushima Dai-ichi NPP accident has occurred. Based on lessons learned from Fukushima accident, worldwide efforts have been made for improving nuclear power plant safety. In Japan, it is important to consider further enhanced nuclear power plant safety, taking into account the global trends of efforts to improve nuclear safety.

The Institute of Applied Energy (hereafter referred to as IAE) has been conducting the study of regulation and standards/criteria, which are required when applying the results of element technology development that will contribute to improving the safety of nuclear power facilities to nuclear power plant. As part of this activity, this research service aims to investigate nuclear regulatory trends and current status of discussion on nuclear safety in the world. In order to evaluate prospectively regulatory directions in the near future, extensive knowledge, such as the concept of ensuring safety for new reactor to be regulated in the future, and nuclear power trends etc., not only the knowledge of current regulations, is required. For this reason, this research service's subjects will be included the trends of nuclear power policies and nuclear power development, the current status of international efforts and discussions related to nuclear safety, and the current status of advanced light water reactors with high-level safety (AP1000, EPR, ESBWR, etc.), in addition to the current nuclear regulatory trends.

3. Contents of the Research Service

Before now, a research work described in the following section 3.1 – 3.3 has been conducted and reports have been made. The major scope of work in FY2015 is to update the report and expand on several issues of interest to the IAE with the primary focus on nuclear regulatory trends and nuclear developments. In particular, the latest information about severe accident management and impact on regulatory polices after Fukushima accidents will be researched.

3.0 Main Targets to be covered

Main targets to be covered by this research are the United States, Europe (major countries promoting nuclear power generation include the United Kingdom, France, and Finland.), other countries pursuing new nuclear power plant construction (e.g., Central and Eastern European countries, the Middle East, the Southeast Asian countries, etc.) and international organizations, etc.

3.1 Trends of Regulations and Nuclear Power Policies

Through the nuclear safety regulatory authorities and private organizations, safety regulatory policies, regulatory development procedures, and the needs for international regulation harmonization will be researched. In addition, the latest trends of nuclear power policies will be studied.

Planned main research items and targets are as follows:

(1) Nuclear safety regulatory policies and trends

(1-1) U.S. NRC's nuclear safety regulatory policies

Research the latest information regarding the following items:

- Prospective impact of lessons learned from Fukushima accident on the nuclear safety regulatory policies
- NRC's subsequent activities for the recommendations of Near-Term Task Force Report
- Current status of the regulation on severe accidents management, and key issues on severe accidents management after Fukushima accident

[Planned targets of research] NRC, NEI, etc.

(1-2) European regulator's nuclear safety regulatory policies

Research the latest information regarding the following items:

- Prospective impact of lessons learned from Fukushima accident on the nuclear safety regulatory policies
- Specific actions to strengthen regulations in European countries
- Current status of the regulation on severe accidents management, and key issues on severe accidents management after Fukushima accident

[Planned targets of research] European regulator (ONR, ASN, STUK, etc.), ENSREG, WENRA, etc.

(1-3) Self-regulation in industry

In this study, it will be researched the latest information regarding to enhance or review the self-regulation in industry, based on lessons learned from Fukushima accident.

- Evaluation of lessons learned from Fukushima accident by INPO, and ASME
- New Nuclear Safety Construct proposed by ASME
- FLEX approach proposed by NEI

[Planned targets of research] INPO, ASME, WANO, NEI, etc.

(2) International organizations' nuclear safety policies and trends

In this study, it will be researched the latest information regarding to enhance or review the safety objectives and safety standards, based on lessons learned from Fukushima accident, within international organizations (IAEA, OECD/NEA, etc.).

In addition, research the latest information regarding the following items:

- Current status of the revise on IAEA Safety standards
- Current status of design-specific activities on new reactor in MDEP

[Planned targets of research] IAEA, OECD/NEA, etc.

(3) Nuclear policy and nuclear power development

(3-1) U.S nuclear policy and nuclear power development

Update to the latest information regarding the following items: In this research, especially, the influence of Fukushima accident should be referred.

- Changes of nuclear energy policy after Fukushima accident
- Demand for new nuclear capacity, and new nuclear construction plan
- DOE's Nuclear Energy Enabling Technologies (NEET) program
- DOE/INL's LWR Sustainability program
- Other private sector's strategic plan for LWR R&D

[Planned targets of research] DOE, U.S. major electric utilities, EPRI, INL, NEI, DOE, etc.

(3-2) Europe and other countries' nuclear policy and nuclear power development

Research the latest information regarding the following items: In this research, especially, the influence of Fukushima accident should be referred.

- Changes of nuclear energy policy after Fukushima accident in European countries
- Demand for new nuclear capacity, and new nuclear construction plan

This research should provide detailed information of the new construction plans in Finland, UK, and France, and a general overview of the new construction developments in other countries.

[Planned targets of research] European major electric utilities, WNI, etc.

3.2 Understanding Users' Needs

Through electric utilities and some other pertinent organizations, user requirements and construction costs will be researched. In addition, major changes and discussions on EUR and URD should be reported.

Main research items and planned research targets are as follows:

- Changes of users' needs after Fukushima accident
- Trend of construction costs (overnight) and busbar costs on recent project, especially changes in the cost of measures to improve safety

[Planned targets of research] U.S. major electric utilities, NEI, EPRI, European major electric utilities, WNA, etc.

3.3 Advanced Light Water Reactors with High-Level Safety

On advanced light water reactors with high-level safety (EPR, AP1000, ESBWR, ABWR, US-APWR, and Korean APR fleet and Russian VVER fleet), their current status will be researched licensing status, construction plans (ordering party and operation start timing), economic efficiency (construction cost), and future design upgrade plans.

In addition, based on Fukushima accidents, their vendor's self-evaluation of measures against severe accidents will be investigated. (e.g. whether there is a design enhanced plan)

3.4 Field Study

Based on the research described in 3.1, 3.2 and 3.3, it is necessary to obtain direct feedback from users and relevant experts to clarify any ambiguities and obtain more detailed or the most up-to-date information. To this end, the contractor should conduct field research. For this purpose, selection of appropriate persons to consult with, setting up meetings, and assistance in taking minutes will be done. The contractor will provide a brief summary of the meetings as attachment to the final report.

Planned places and time frames of field survey are as follows:

- Europe (regulatory agencies concerned, major electricity utilities, WNA, etc.), about one week
- United States (NRC, DOE, major electricity utilities, INPO, NEI, etc.), about one week

4. Implementation Period

From the date of contract signing

To January 29, 2016

5. Promotion of the Service

In the event there are concerns that implementation of the service could be delayed, the reason for such delay shall be promptly reported to the Director of Nuclear Power Engineering Center (in charge of next-generation LWR Gr) and his or her directions followed.

6. Interpretation of specifications and treatment of matters not stipulated herein

Any matter not stipulated herein shall be discussed with the Director of Nuclear Power Engineering Center (in charge of next-generation LWR Gr) and his or her directions followed.

7. Submission of Outcomes

(1) Preliminary Summary Report

1) Items of Delivery

- Report: Send by E-mail

2) Delivery Deadline: late in September or early in October, 2015

The details will be adjusted based on the progress of research work.

(2) Final Report

1) Items of Delivery

- Report: One copy
- Electronic media: One set

2) Delivery Deadline: January 29, 2016

(3) Place for Delivery: Nuclear Power Engineering Center, The Institute of Applied Energy, Tokyo, Japan

(4) Meeting to report about research work

IAE will hold a meeting to report about this research work. The contractor should dispatch a researcher to the meeting, and should report information and findings of research which will be available up to the meeting. The meeting will be held in Tokyo. The details will be adjusted based on the progress of research work.

8. Acceptance Inspection and Completion Verification Method

Acceptance inspection comprises confirmation of the completion notice, items delivered, and cost incurred for conducting this research service (details are separately prescribed).

- Basis for hourly unit price of persons who conducted research and others
- Hours spent in research and others (checking on daily log, etc.)
- Expenditure on research and others (business traveling expenses, material purchase expenses, copying expenses, etc.)

9. Notes for Making Proposals

Bidders shall propose specific subjects to be researched and research methods for the specifications above.