



**IAEA MISSION TO REVIEW
NISA'S APPROACH TO THE
"COMPREHENSIVE ASSESSMENTS FOR
THE SAFETY OF EXISTING POWER
REACTOR FACILITIES"**

Tokyo and Ohi, Japan
23 – 31 January 2012

Preliminary Summary

IAEA MISSION TO JAPAN

PRELIMINARY SUMMARY

31 JANUARY 2012

This report provides the preliminary summary of the IAEA mission to review NISA's approach to the Comprehensive Assessments for the Safety of Existing Power Reactor Facilities. The full report of the mission will be provided to the Government of Japan when it is finalized by the IAEA.

To strengthen global nuclear safety, the IAEA Action Plan on Nuclear Safety asks Member States to undertake promptly an assessment of nuclear power plant (NPP) protections against site specific extreme natural hazards and to implement the necessary corrective actions in a timely manner.

At the request of the Government of Japan, the IAEA reviewed the Nuclear and Industrial Safety Agency's (NISA) approach to the *Comprehensive Assessments for the Safety of Existing Power Reactor Facilities* and NISA's approach to the review of the licensee's assessments. NISA issued its Instruction on Comprehensive Assessments for the Safety of Existing Power Reactor Facilities in July 2011.

The IAEA safety review mission was conducted by a team of five IAEA and three international experts with support from IAEA public information and administrative staff from 23-31 January 2012. The mission consisted of meetings at NISA's offices in Tokyo and a visit to the Ohi Nuclear Power Station (NPS) that provided an example of how the Comprehensive Safety Assessment was being implemented by the licensee.

The scope of the IAEA mission covers the NISA review process of *the Comprehensive Assessments for the Safety of Existing Power Reactor Facilities* and uses the IAEA document *A Methodology to Assess the Safety Vulnerabilities of Nuclear Power Plants Against Site Specific Extreme Natural Hazards* and the associated IAEA Safety Standards to identify whether NISA's Comprehensive Safety Assessment process appropriately considers: external hazards, evaluation of safety margins, plant vulnerabilities and severe accident management.

The mission was divided into four areas:

- Regulatory Review and Assessment Process;
- External Hazards and Evaluation of Safety Margins;
- Plant Vulnerabilities against Station Blackout and Loss of Ultimate Heat Sink; and
- Severe Accident Management.

The first day of the mission was devoted to presentations by NISA on the instructions and review process of the Comprehensive Safety Assessment and by Kansai Electric Power Company (KEPCO) on the results of the Comprehensive Assessment for the Safety of Ohi Unit 3. The mission team also presented its initial review comments and areas for additional discussion. The second and third days included detailed discussions and travel to Obama, Japan. The fourth day the

team met with KEPCO officials and toured the Ohi NPS. The remainder of the mission was devoted to clarifying the issues and preparing the report. On the final day of the mission, the preliminary summary report was provided to the Director General of NISA and a press conference was held.

NISA explained the Comprehensive Safety Assessment process, which comprises a Primary and a Secondary Assessment, to the mission team. On 11 July 2011, the Chief Cabinet Secretary, the Minister of Economy, Trade and Industry (METI) and the Minister for the Restoration from and Prevention of Nuclear Accident issued a *Confirmation of the Safety of Nuclear Power Stations in Japan*. This document explains that the national Government will implement Comprehensive Safety Assessments utilizing the stress tests as introduced in Europe for further ensuring safety and ensuring peace of mind. The results of the assessments will be confirmed by NISA and their validity will be further confirmed by the Nuclear Safety Commission (NSC). For the technical review of the assessments NISA receives support from the Japanese Nuclear Energy Safety Organization (JNES).

The Primary Assessment will inform the decision whether to restart operations at suspended NPPs and the Secondary Assessment will inform whether to continue or halt operations at operating NPPs. The Secondary Assessment is explained as being based on the stress tests in Europe and the deliberations of the *Investigation and Verification Committee on the Accidents at the Fukushima Nuclear Power Station (TEPCO)*.

The distinction between Primary and Secondary Assessments was also explained. The Primary Assessment is to assess the degree of margin of safety. The Secondary Assessment is for the purpose of implementing an overall evaluation at all NPPs, including those that are currently in operation and also those that are subject to the Primary Assessment. NISA confirmed to the IAEA mission team that the Comprehensive Safety Assessments would be considered as completed when both the Primary and Secondary Assessments had been completed, reviewed and confirmed by NISA.

The Comprehensive Safety Assessments were conducted following the implementation of the emergency safety measures that were directed by METI on 30 March 2011. The emergency safety measures assume that an earthquake/tsunami causes the loss of all AC power and the loss of the ultimate heat sink. In addition, on 7 June 2011, METI directed the nuclear utilities to complete additional measures regarding the working environment in the Main Control Room, communications inside the NPP premises, protective gear for high-level radiation areas, measures to prevent hydrogen explosions and heavy equipment for removing rubble. The mission team observed some of the measures that were implemented at the Ohi NPS.

On 21 July 2011, NISA issued *Assessment Procedures and Implementation Plan the Comprehensive Assessments for the Safety of Existing Power Reactor Facilities* which sets out the expectations for licensees when undertaking the Comprehensive Safety Assessment. The nuclear utilities were informed of the NISA document via a letter on 22 July 2011. NISA has confirmed that it has received 15 Primary Assessments. NISA has started to review the submitted Primary Assessments, and the review of Ohi NPS Units 3 and 4 is at an advanced stage. In addition to the documents referred to above, the mission team received a draft copy of the NISA review of the Ohi NPS Primary Assessment upon arrival in Japan. This document, together with the visit to Ohi NPS, enabled the mission team to consider a practical example of a Primary Assessment and a NISA review.

The IAEA mission received excellent cooperation from all parties, receiving information from NISA, JNES, and KEPCO. The mission identified a number of good practices, and also made recommendations and suggestions to enhance the effectiveness of the Comprehensive Safety Assessments.

The conclusion of the team is that NISA's instructions and review process for the Comprehensive Safety Assessments are generally consistent with IAEA Safety Standards.

Good practices identified by the mission team are the following:

- Based on NISA instructions and commitments of the licensees, emergency safety measures were promptly addressed in NPPs in Japan following the accident on 11 March, 2011;
- NISA conducted an independent plant walkdown of emergency measures implemented by the licensee. This walkdown was appropriate and enhanced confidence that postulated actions could be performed;
- NISA demonstrated a notable level of transparency and interested party consultation related to the Comprehensive Safety Assessment and its review process; and
- By observing the European stress tests, NISA is demonstrating its commitment to further enhance nuclear safety by gaining experience from other countries.

The mission team identified issues that would enhance the overall effectiveness of the Comprehensive Safety Assessment process and further regulatory activities, and made the following recommendations:

- NISA should clarify its guidance regarding the expectations for conducting and reviewing Comprehensive Safety Assessments. The instructions can be improved by being more descriptive without being prescriptive, and by setting standard expectations;
- NISA should ensure that if any future actions by the licensees are needed for its safety decision, then they are documented and subjected to follow-up inspection as appropriate. Otherwise, NISA should confirm that interim measures are implemented prior to facility operation, as applicable;
- NISA should conduct meetings with interested parties near the nuclear facilities that are subject to Comprehensive Safety Assessment, in addition to those activities already undertaken;
- NISA should ensure that the definition of the safety margin capacity with appropriate confidence level is specified and communicated to the licensees;
- NISA should ensure that the seismic safety margin assessment includes the system walkdowns for checking completeness of the basic safety function success path, and the seismic/flood capability walkdowns for identification of interactions and collecting as-built and as-operated information to be used in safety margin calculations;
- NISA should ensure that in the Secondary Assessment the provisions for mitigation of severe accidents should be addressed more comprehensively. Such an assessment should form a basis for medium and long term implementation plans of the licensees; and
- In the medium and long term following the Comprehensive Safety Assessments NISA

should require licensees to develop comprehensive accident management programmes in compliance with recently issued IAEA Safety Standards in the area of severe accident management.

In addition, the mission team had the following suggestions:

- NISA should seek to identify, document and implement lessons from the experience gained during early assessments and reviews to confirm or improve its guidance and to maximize consistency for subsequent reviews;
- NISA should ensure that the Secondary Assessments are completed, evaluated and confirmed by regulatory review with appropriate timescales;
- The effectiveness of safety improvements by implementation of the upgrades aimed to increase safety margin against seismic and tsunami hazards should be checked by conducting Seismic and Tsunami Probabilistic Safety Assessment using methodologies consistent with IAEA Safety Standards and international practice; and
- For the Secondary Assessment, NISA should consider closer integration of accident management and on-site emergency preparedness measures by verification of additional components, taking into account the relevant IAEA Safety Standards as well as lessons learned from the European stress tests.