Hokkaido Electric Power Co., Inc.
President Yoshitaka Sato

Regarding Implementation of Safety Assessment Concerning the Impact of Seismic Ground Motion and Tsunami on the Nuclear Facilities Based on the Knowledge of the 2011 Off the Pacific Coast of Tohoku Earthquake (Direction)

Nuclear and Industrial Safety Agency
Hiroyuki Fukano
NISA-151d-11-26


Pursuant to the direction, interim reports on the seismic back check have been submitted from reactor licensees, and NISA is currently verifying the validity of the contents of the reports. During the interim assessment of seismic back check, some issues requiring re-examination of their validity are being identified.

Moreover, the following knowledge has been obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake occurred on March 11,
2011:

1) Large-scale seismic ground motion and tsunami occurred associated with the trench type earthquake due to a greatest amount of slides ever observed and simultaneous occurrence of seismic source segments exceeding the expected scale.

2) The amplitude of tsunami occurred associated with the earthquake increased due to comparatively long-period waves and short-period waves superimposed each other.

3) Due to the crustal deformations exceeding the expected scale occurred associated with the earthquake, stress field was affected across a wide area and normal fault type earthquakes also occurred.

In implementing the seismic back check, NISA considers that the issues requiring re-examination of their validity, which have been identified during the interim assessment, and the knowledge obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake are needed to be taken into account.

As to Tomari Nuclear Power Station (NPS) of your company, there are more than one en echelon faults extending about 10 km to 40 km in the offshore area in front of the facility site. Based on the fact that the simultaneous occurrence of seismic source segments exceeding the expected scale occurred in the 2011 Off the Pacific Coast of Tohoku Earthquake, NISA considers that the seismic ground motion and tsunami assessment must be carried out with the coupled motion of these faults taken into account.

Accordingly, NISA requests your company to formulate the implementation plan concerning the assessment specified below and submit the plan to NISA by November 18, 2011, as well as to report the implementation status to NISA periodically within a two-month interval. Incidentally, NISA directs your company to submit the assessment as soon as it is compiled.

Required Item

Analysis using the appropriate seismic source and wave source in light of the simultaneous occurrence of seismic source segments exceeding the expected scale in the 2011 Off the Pacific Coast of Tohoku Earthquake and impact
assessment of seismic ground motion and tsunami on Tomari NPS of your company estimated from the analysis
Ministry of Economy, Trade and Industry

02.11.2011 NA No. 4
November 11, 2011

Tohoku Electric Power Co., Inc.
President Makoto Kaiwa

Regarding Implementation of Safety Assessment Concerning the Impact of Seismic Ground Motion and Tsunami on the Nuclear Facilities Based on the Knowledge of the 2011 Off the Pacific Coast of Tohoku Earthquake (Direction)

Nuclear and Industrial Safety Agency
Hiroyuki Fukano
NISA-151d-11-27

Pursuant to “Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities” (decided by the Nuclear Safety Commission in 2006, hereinafter referred to as “Seismic Guide”) revised in September 2006, the Nuclear and Industrial Safety Agency (hereinafter referred to as “NISA”) requested reactor licensees to conduct the seismic safety assessment of the existing power reactor facilities according to the revised Seismic Guide (hereinafter referred to as “seismic back check”) by the document “Regarding Implementation of Seismic Safety Assessment of the Existing Power Reactor Facilities in response to the revision of the ‘Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities’ ” dated September 20, 2006 (19.09.2006 NA No. 6). Pursuant to the direction, interim reports on the seismic back check have been submitted from reactor licensees, and NISA is currently verifying the validity of the contents of the reports. During the interim assessment of seismic back check, some issues requiring re-examination of their validity are being identified.

Moreover, the following knowledge has been obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake occurred on March 11,
2011:

1) Large-scale seismic ground motion and tsunami occurred associated with the trench type earthquake due to a greatest amount of slides ever observed and simultaneous occurrence of seismic source segments exceeding the expected scale.

2) The amplitude of tsunami occurred associated with the earthquake increased due to comparatively long-period waves and short-period waves superimposed each other.

3) Due to the crustal deformations exceeding the expected scale occurred associated with the earthquake, stress field was affected across a wide area and normal fault type earthquakes also occurred.

In implementing the seismic back check, NISA considers that the issues requiring re-examination of their validity, which have been identified during the interim assessment, and the knowledge obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake are needed to be taken into account.

As to Higashidori Nuclear Power Station (NPS) of your company, the wave source model is based on the tsunami occurred in the 1968 Tokachi-Oki Earthquake and 1896 Meiji-Sanriku Tsunami. However, according to the recent researches, tsunami caused by coupled destruction occurred off the coast of Tokachi and Nemuro should also be taken into consideration. In addition, a wave source model of the massive tsunami occurred off the coast of Kushiro in the 17th century has also been newly presented. Based on the recent researches and the fact that the simultaneous occurrence of seismic source segments exceeding the expected scale occurred in the 2011 Off the Pacific Coast of Tohoku Earthquake, NISA considers that analysis using the appropriate seismic source and wave source and impact assessment of seismic ground motion and tsunami estimated from the analysis on Higashidori NPS of your company must be conducted.

Furthermore, although the seismic back check has found that part of the fault located within the premises of the NPS is causing a deformation such as small fractures in the Quaternary strata, your company says such deformation is caused by the expansion and contraction of degraded rock. However, there are not sufficient reasonable grounds for denying the activity from the late Quaternary onwards based the trench survey results, and NISA considers the review of the fault activity to be necessary.
Accordingly, NISA requests your company to formulate the implementation plan concerning the assessment specified below and submit the plan to NISA by November 18, 2011, as well as to report the implementation status to NISA periodically within a two-month interval. Incidentally, NISA directs your company to submit the assessment as soon as they are compiled.

**Required Items**

1. Analysis using the appropriate seismic source and wave source in light of the simultaneous occurrence of seismic source segments exceeding the expected scale in the 2011 Off the Pacific Coast of Tohoku Earthquake and impact assessment of seismic ground motion and tsunami on Higashidori NPS of your company estimated from the analysis

2. Assessment of the fault activity based on the survey and analysis of the fault that causes deformation such as small fractures in the Quaternary strata on the premises
Ministry of Economy, Trade and Industry

02.11.2011 NA No. 4
November 11, 2011

Chubu Electric Power Co., Inc.
President Akihisa Mizuno

Regarding Implementation of Safety Assessment Concerning the Impact of Seismic Ground Motion and Tsunami on the Nuclear Facilities Based on the Knowledge of the 2011 Off the Pacific Coast of Tohoku Earthquake (Direction)

Nuclear and Industrial Safety Agency
Hiroyuki Fukano
NISA-151d-11-28

Pursuant to “Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities” (decided by the Nuclear Safety Commission in 2006, hereinafter referred to as “Seismic Guide”) revised in September 2006, the Nuclear and Industrial Safety Agency (hereinafter referred to as “NISA”) requested reactor licensees to conduct the seismic safety assessment of the existing power reactor facilities according to the revised Seismic Guide (hereinafter referred to as “seismic back check”) by the document “Regarding Implementation of Seismic Safety Assessment of the Existing Power Reactor Facilities in response to the revision of the ‘Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities’ ” dated September 20, 2006 (19.09.2006 NA No. 6). Pursuant to the direction, interim reports on the seismic back check have been submitted from reactor licensees, and NISA is currently verifying the validity of the contents of the reports. During the interim assessment of seismic back check, some issues requiring re-examination of their validity are being identified.

Moreover, the following knowledge has been obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake occurred on March 11,
2011:

1) Large-scale seismic ground motion and tsunami occurred associated with the trench type earthquake due to a greatest amount of slides ever observed and simultaneous occurrence of seismic source segments exceeding the expected scale.

2) The amplitude of tsunami occurred associated with the earthquake increased due to comparatively long-period waves and short-period waves superimposed each other.

3) Due to the crustal deformations exceeding the expected scale occurred associated with the earthquake, stress field was affected across a wide area and normal fault type earthquakes also occurred.

In implementing the seismic back check, NISA considers that the issues requiring re-examination of their validity, which have been identified during the interim assessment, and the knowledge obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake are needed to be taken into account.

As to Hamaoka Nuclear Power Station (NPS) of your company, magnitude of the earthquake in the anticipated Tokai and Tonankai Consolidated Type Earthquake is estimated to be 8.4 and amplitude of tsunami is estimated to be 6 to 7 meters based on the 1854 Ansei-Tokai Earthquake in the report on the results of seismic safety assessment submitted by your company in response to the revision of the Seismic Guide. However, based on the fact that the simultaneous occurrence of seismic source segments exceeding the expected scale occurred in the 2011 Off the Pacific Coast of Tohoku Earthquake, NISA considers that analysis using the appropriate seismic source and wave source and impact assessment of seismic ground motion and tsunami estimated from the analysis on Hamaoka NPS of your company need to be conducted.

Accordingly, NISA requests your company to formulate the implementation plan concerning the assessments specified below and submit the plan to NISA by November 18, 2011, as well as to report the implementation status to NISA periodically within a two-month interval. Incidentally, NISA directs your company to submit the assessments as soon as they are compiled.
Required Items

1. In light of the discussions at the Central Disaster Prevention Council and the simultaneous occurrence of seismic source segments exceeding the expected scale in the 2011 Off the Pacific Coast of Tohoku Earthquake, appropriate tsunami analysis with the widened wave source area expected by reference to the long-term assessment of trench type earthquakes conducted by the Headquarters for Earthquake Research Promotion, and appropriate tsunami assessment with the time difference of wave sources and long-period waves and short-period waves superimposed each other taken into consideration.

2. Appropriate assessment of earthquakes with the widened wave source area expected by reference to the long-term assessment of trench type earthquakes conducted by the Headquarters for Earthquake Research Promotion and in light of the simultaneous occurrence of seismic source segments exceeding the expected scale in the 2011 Off the Pacific Coast of Tohoku Earthquake.
Kansai Electric Power Co., Inc.
President Akihisa Mizuno

Regarding Implementation of Safety Assessment Concerning the Impact of Seismic Ground Motion and Tsunami on the Nuclear Facilities Based on the Knowledge of the 2011 Off the Pacific Coast of Tohoku Earthquake (Direction)

Nuclear and Industrial Safety Agency
Hiroyuki Fukano
NISA-151d-11-29
NISA-161d-11-6


Pursuant to the direction, interim reports on the seismic back check have been submitted from reactor licensees, and NISA is currently verifying the validity of the contents of the reports. During the interim assessment of seismic back check, some issues requiring re-examination of their validity are being identified.

Moreover, the following knowledge has been obtained to date from
the 2011 Off the Pacific Coast of Tohoku Earthquake occurred on March 11, 2011:

1) Large-scale seismic ground motion and tsunami occurred associated with the trench type earthquake due to a greatest amount of slides ever observed and simultaneous occurrence of seismic source segments exceeding the expected scale.

2) The amplitude of tsunami occurred associated with the earthquake increased due to comparatively long-period waves and short-period waves superimposed each other.

3) Due to the crustal deformations exceeding the expected scale occurred associated with the earthquake, stress field was affected across a wide area and normal fault type earthquakes also occurred.

In implementing the seismic back check, NISA considers that the issues requiring re-examination of their validity, which have been identified during the interim assessment, and the knowledge obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake are needed to be taken into account.

As to Mihama, Ohi, and Takahama Power Stations (PSs) of your company, a historical record showing that major tsunami hit Wakasa area in the Tensho Era was found as a result of the literature research, and the necessity of conducting a stability assessment of slopes in the surrounding areas was pointed out at the Hearings on earthquakes and tsunamis. In light of the above, NISA considers that re-assessment of the stability of slopes in the surrounding areas and impact assessment of the stability on the facilities important to safety based on the re-assessment are required to be conducted in association with the research on tsunami occurred in Wakasa area in the past and the impact assessment based on the research as well as the changes in the standard seismic ground motion.

Accordingly, NISA requests your company to formulate the implementation plan concerning the assessments specified below and submit the plan to NISA by November 18, 2011, as well as to report the implementation status to NISA periodically within a two-month interval. Incidentally, NISA directs your company to submit the assessments as soon as they are compiled.
Required Items

1. Tsunami sediment excavation research followed by impact assessment of tsunami on Mihama, Ohi, and Takahama PSs.

2. Re-assessment of the stability of slopes in the surrounding areas in association with the changes in the standard seismic ground motion and impact assessment of the stability on the facilities important to safety based on the re-assessment.
Ministry of Economy, Trade and Industry

02.11.2011 NA No. 4
November 11, 2011

Japan Atomic Energy Agency
President Atsuyuki Suzuki

Regarding Implementation of Safety Assessment Concerning the Impact of Seismic Ground Motion and Tsunami on the Nuclear Facilities Based on the Knowledge of the 2011 Off the Pacific Coast of Tohoku Earthquake (Direction)

Nuclear and Industrial Safety Agency
Hiroyuki Fukano
NISA-151d-11-29
NISA-161d-11-6

Pursuant to “Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities” (decided by the Nuclear Safety Commission in 2006, hereinafter referred to as “Seismic Guide”) revised in September 2006, the Nuclear and Industrial Safety Agency (hereinafter referred to as “NISA”) requested reactor licensees to conduct the seismic safety assessment of the existing power reactor facilities according to the revised Seismic Guide (hereinafter referred to as “seismic back check”) by the document “Regarding Implementation of Seismic Safety Assessment of the Existing Power Reactor Facilities in response to the revision of the ‘Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities’ ” dated September 20, 2006 (19.09.2006 NA No. 6). Pursuant to the direction, interim reports on the seismic back check have been submitted from reactor licensees, and NISA is currently verifying the validity of the contents of the reports. During the interim assessment of seismic back check, some issues requiring re-examination of their validity are being identified.

Moreover, the following knowledge has been obtained to date from
the 2011 Off the Pacific Coast of Tohoku Earthquake occurred on March 11, 2011:

1) Large-scale seismic ground motion and tsunami occurred associated with the trench type earthquake due to a greatest amount of slides ever observed and simultaneous occurrence of seismic source segments exceeding the expected scale.

2) The amplitude of tsunami occurred associated with the earthquake increased due to comparatively long-period waves and short-period waves superimposed each other.

3) Due to the crustal deformations exceeding the expected scale occurred associated with the earthquake, stress field was affected across a wide area and normal fault type earthquakes also occurred.

In implementing the seismic back check, NISA considers that the issues requiring re-examination of their validity, which have been identified during the interim assessment, and the knowledge obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake are needed to be taken into account.

As to the Fast Breeder Reactor Research and Development Center of your agency, a historical record showing that major tsunami hit Wakasa area in the Tensho Era was found as a result of the literature research, and the necessity of conducting a stability assessment of slopes in the surrounding areas was pointed out at the Hearings on earthquakes and tsunamis. In light of the above, NISA considers that re-assessment of the stability of slopes in the surrounding areas and impact assessment of tsunami on the facilities important to safety based on the re-assessment are required to be conducted in association with the research on tsunami occurred in Wakasa area in the past and the impact assessment based on the research as well as the changes in the standard seismic ground motion.

Accordingly, NISA requests your agency to formulate the implementation plan concerning the assessments specified below and submit the plan to NISA by November 18, 2011, as well as to report the implementation status to NISA periodically within a two-month interval. Incidentally, NISA directs your company to submit the assessments as soon as they are compiled.
Required Items

1. Tsunami sediment excavation research followed by impact assessment of tsunami on the Fast Breeder Reactor Research and Development Center

2. Re-assessment of the stability of slopes in the surrounding areas in association with the changes in the standard seismic ground motion and impact assessment of the stability on the facilities important to safety based on the re-assessment
Japan Atomic Power Co., Inc.
President Yasuo Hamada

Regarding Implementation of Safety Assessment Concerning the Impact of Seismic Ground Motion and Tsunami on the Nuclear Facilities Based on the Knowledge of the 2011 Off the Pacific Coast of Tohoku Earthquake (Direction)

Nuclear and Industrial Safety Agency
Hiroyuki Fukano
NISA-151d-11-30

Pursuant to “Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities” (decided by the Nuclear Safety Commission in 2006, hereinafter referred to as “Seismic Guide”) revised in September 2006, the Nuclear and Industrial Safety Agency (hereinafter referred to as “NISA”) requested reactor licensees to conduct the seismic safety assessment of the existing power reactor facilities according to the revised Seismic Guide (hereinafter referred to as “seismic back check”) by the document “Regarding Implementation of Seismic Safety Assessment of the Existing Power Reactor Facilities in response to the revision of the ‘Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities’ ” dated September 20, 2006 (19.09.2006 NA No. 6). Pursuant to the direction, interim reports on the seismic back check have been submitted from reactor licensees, and NISA is currently verifying the validity of the contents of the reports. During the interim assessment of seismic back check, some issues requiring re-examination of their validity are being identified.

Moreover, the following knowledge has been obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake occurred on March 11,
2011:

1) Large-scale seismic ground motion and tsunami occurred associated with the trench type earthquake due to a greatest amount of slides ever observed and simultaneous occurrence of seismic source segments exceeding the expected scale.

2) The amplitude of tsunami occurred associated with the earthquake increased due to comparatively long-period waves and short-period waves superimposed each other.

3) Due to the crustal deformations exceeding the expected scale occurred associated with the earthquake, stress field was affected across a wide area and normal fault type earthquakes also occurred.

In implementing the seismic back check, NISA considers that the issues requiring re-examination of their validity, which have been identified during the interim assessment, and the knowledge obtained to date from the 2011 Off the Pacific Coast of Tohoku Earthquake are needed to be taken into account.

As to Tsuruga Power Station (PS) of your company, a historical record showing that major tsunami hit Wakasa area in the Tensho Era was found as a result of the literature research, and the necessity of conducting a stability assessment of slopes in the surrounding areas was pointed out at the Hearings on earthquakes and tsunamis. In light of the above, NISA considers that re-assessment of the stability of slopes in the surrounding areas and impact assessment of the stability on the facilities important to safety based on the re-assessment are required to be conducted in association with the research on tsunami occurred in Wakasa area in the past and the impact assessment based on the research as well as the changes in the standard seismic ground motion.

Moreover, in the interim report on the results of seismic safety assessment submitted by your company in response to the revision of the Seismic Guide, activities of the Urasoko Fault running through the PS site and the fracture zone located directly below the reactor building are denied based on the results of the topographic and geological survey.

However, in view of the fact that the stress field was affected across a wide area and normal fault type earthquakes also occurred due to the crustal deformations exceeding the expected scale occurred associated with the earthquake, NISA considers assessment of the impact of ground displacement including the fracture zone associated with the Urasoko Fault
activity and re-assessment of the activity of the faults that had not been considered in the seismic design of Tokai No.2 PS of your company are needed to be conducted.

Accordingly, NISA requests your company to formulate the implementation plan concerning the assessments specified below and submit the plan to NISA by November 18, 2011, as well as to report the implementation status to NISA periodically within a two-month interval. Incidentally, NISA directs your company to submit the assessment and assessments as soon as they are compiled.

Required Items

1. Impact assessment of tsunami on Tsuruga PS of your company based on the tsunami sediment excavation research

2. Clarification of the assessment method for heterotaxis in the vicinity of the active fault at Tsuruga PS site of your company and impact assessment of heterotaxis on the reactor buildings or other facilities based on the method

3. Re-assessment of the stability of slopes in the surrounding areas of Tsuruga PS of your company and impact assessment of the stability on the facilities important to safety based on the re-assessment

4. Re-assessment of the activity and length of the fault at Tokai No2 PS of your company and assessment of the standard seismic motion based on the re-assessment