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Nuclear and Industrial Safety Agency

INES Ratings on the Events in Fukushima Dai-ichi NPS and Fukushima Dai-ni NPS by the Tohoku Regional Pacific Ocean Offshore Earthquake

Ratings of the International Nuclear and Radiological Event Scale (INES) on the events in Fukushima Dai-ichi Nuclear Power Station (NPS) and Fukushima Dai-ni NPS, Tokyo Electric Power Co. Inc. (TEPCO), by the Tohoku Regional Pacific Ocean Offshore Earthquake are as follows:

1. INES

- INES is the rating, which International Atomic Energy Agency (IAEA) and Nuclear Energy Agency, Organization for Economic Cooperation and Development (OECD/NEA) established and proposed to the Member States in March 1992, in order to indicate the impact on safety by the individual event in a nuclear facility and so on.
- Japan has utilized it since 1 August 1992. As a process, when an event occurs, firstly, Nuclear and Industrial Safety Agency (NISA) temporarily rates on it and then, considering the confirmed recurrence prevention measures based on the concrete causes found, the International Nuclear Event Scale Evaluation Subcommittee (Chairman: Dr. Naoto Sekimura, Professor of University of Tokyo, Nuclear Professional School Engineering), which set up in the Nuclear and Industrial Safety subcommittee of the Advisory Committee for Natural Resources and Energy, technically evaluating from specialist view points, assess the official level.

2. Events in Fukushima Dai-ichi NPS and Fukushima Dai-ni NPS, TEPCO, by the Tohoku Regional Pacific Ocean Offshore Earthquake

(1) Units 1, 2 and 3 of Fukushima Dai-ichi NPS

In these Units, the coolant injection by the Turbine Driven Pump

became the only workable cooling function, due to total loss of alternative current power supply resulted from inability to provide services by the external power supply and pumps for emergency diesel power generator cooling system and Residual Heat Removal (RHR) seawater cooling system, caused by the flooding by tsunami.

It is considered that such total loss of cooling function led to the reactor core to be damaged, due to the inability to provide service by the Turbine Driven Pump resulted from the temperature rise in the Suppression Chamber caused by the operation of the pump.

The leakage of radioactive materials continues.

(Temporary rating of INES*)

Criterion 1	Criterion 2	Criterion 3	Rating
TBD	5	3	(5)

(2) Unit 4 of Fukushima Dai-ichi NPS

In the Unit, the cooling function and making up water function for the spent fuel pit failed to work, due to total loss of alternative current power supply resulted from inability to provide services by the external power supply and pumps for emergency diesel power generator cooling system and RHR seawater cooling system, caused by the flooding by tsunami.

The reactor building was damaged by an explosion assumed to be caused by hydrogen build-up, resulted from boiling-off and evaporation of the water in the pit due to decay heat of spent fuels.

(Temporary rating of INES*)

Criterion 1	Criterion 2	Criterion 3	Rating
TBD	TBD	3	(3)

The rating on Criteria 1 and 2 are to be determined later because the event is not led to be ceased.

(3) Units 1, 2 and 4 of Fukushima Dai-ichi NPS

In these Units, decay heat could not be transferred to the sea, due to inability to provide services by the pump for RHR seawater cooling system, caused by the flooding by tsunami.

The Turbine Driven Pump became unworkable resulted from the temperature rise in the Suppression Chamber caused by the operation of the pump. However, the pump for RHR seawater cooling system was fixed

and its operation led the reactor to cold shutdown.

(Temporary rating of INES*)

Criterion 1	Criterion 2	Criterion 3	Rating
-	-	3	3

3. Procedures to be taken

The official level of INES is assessed by the International Nuclear Event Scale Evaluation Subcommittee (Chairman: Dr. Naoto Sekimura, Professor of University of Tokyo, Nuclear Professional School Engineering), which set up in the Nuclear and Industrial Safety Subcommittee of the Advisory Committee for Natural Resources and Energy, through the technical evaluation from specialist view points, considering the confirmed recurrence prevention measures based on the concrete causes found.

(*Reference)

INES (International Nuclear and Radiological Event Scale) is rated by 3 criteria (Criterion 1: People and the Environment, Criterion 2: Radiological Barriers and Controls at facilities, Criterion 3: Defence in Depth). The highest level among the three becomes the rating of the event. The scale ranges from level 0 (No safety significance) to level 7 (Major accident).

(Ref. INES User's Manual 2008 Edition)

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