

## 7. What's going in Korean Governmental Nuclear Authorities toward Post-Fukushima

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About four months had passed since Fukushima accident which occurred on March 11th, 2011. Scale 9.0 earthquake and tsunami hit east Japan and these gave a severe disaster (more than 15,000:died and more than 7,000:missing) to Japan and especially to Fukushima nuclear power plants.

Before the accident, Korea had enjoyed a nuclear Renaissance due to many good news like the success of UAE project, Jordan project, etc. which were achieved in 2009. But unfortunately, Fukushima accident took away the enjoyment and made a slump in Korean nuclear industry.

Many Korean people worried about the effects of Fukushima accident. The worries are; 1) Why radioactive materials come to Korea although the westerlies can protect the transfer of the radioactive nuclide to eastern countries? 2) The accumulated effects of radioactive materials on body may be very severe although the quantities are so small? 3) The rain can cause the contamination 4) Is it possible to eat the fish? 5) Are the young babies safe against Fukushima accident? As the results of these worries, some Korean people bought much drinking water and salt as well as sea mustard & sea tangle. Some elementary schools at Kyunggi province had been closed to protect the students.

To recover the uncertain situation and to raise

the positive PR (public relations) toward Korean people as well as foreign customers Korean governmental nuclear authorities have prepared so many provisions toward post-Fukushima.

MEST (Ministry of Education and Science & Technology), which prepares for the nuclear policy and performs the inspections toward nuclear power plants, performed the safety inspection from March 23rd till April 30th toward total nuclear power plants to identify the safety based on the most severe accident scenario(earthquake->large scale tsunami->power cutoff->large scale accident). As the results of this inspection, MEST plans to proceed total 50 long and short term improvement countermeasures for 5 years from 2011 to overcome the earthquake, tsunami and severe accidents. These improvements will be reported to the governmental safety committee for review by a half-year term. MEST thinks that these improvements will give a strong reliability to Korean people and Korea can lead the nuclear industry over the world toward post-Fukushima.

KHNP (Korea Hydro & Nuclear Power Co., Ltd), which is a sole nuclear power generation company in Korea, also inspected all nuclear power plants thru March 16-18 in himself. MEST inspection was performed from March 28th till April 13th. Especially Kori #1 unit, which is planned to extend the lifetime, was inspected in detail by KINS

(Korea Institute of Nuclear Safety; a regulatory authority under MEST) from April 22nd till May 3rd. The detailed plan for reinforcing the safety toward post-Fukushima is shown in table. 1

Table 1 Plan for reinforcing the safety toward post-Fukushima

Field	Main activities
Against Earthquake	Nuclear power plants are automatically stopped in case the scale is over 6.4.
Against Tsunami	Nuclear power plants are automatically stopped in case the scale is over 6.4.
Protection of power system	Mobile type generator equipped in the vehicle will be secured (one set per site).
Against the severe accidents	Install PAR (passive autocatalytic recombiner) at all nuclear power plants to control hydrogen.
Emergency healthcare System	Secure additional medicine as well as protective goods (two times than before).

KINS (Korea Institute of Nuclear Safety) was so busy so far to check the environmental radiation as well as to check the contamination level toward passengers into Korea. KINS had many jobs after Fukushima accident and the president, Mr. Lee MB also visited to KINS on May 17th to check the national radiation monitoring system and encourage KINS' activities. KINS had developed SIREN (System for Identifying Radiation in Environments nationwide) after Fukushima accident, which consists of environmental radiation monitoring & space analysis module, module to meet the foreign radioactive accidents and module for surveying radioactivity at site. The weather data at total 75 points are inputted by 6 hours interval.

KAERI (Korea Atomic Energy Research Institute), as a R&D authority, will focus the study on severe accidents. KAERI plans to study in depth on the behavior of fuel following to LOCA( at Core and SFP), hydraulic behavior at core relating to the depressurization at RCS and the injection of

emergency core cooling water, reliability on passive type safety system, uncertainty at the latter stage of core melting and performance of containment vessel at severe accident condition. Because the severe accident study is much related to PSA(Probabilistic safety assessment), KAERI has developed FTREX(Fault tree reliability evaluation eXpert) software for safety evaluation. The right to sell this software was given to EPRI in U.S.A and the sale was recorded over 600,000 U\$ so far and KAERI will focus the development of computer programs on severe accident analysis toward post-Fukushima.

KEPCO NF(Nuclear Fuel), as a sole nuclear fuel manufacturing company, plans to develop the new cladding tube to restrict the hydrogen production in consideration of severe accident and the complex material (SiC) cladding tube to overcome the weakness of Zr tube toward post-Fukushima.

The plans at Korean governmental nuclear authorities toward post-Fukushima are briefly reviewed as above. Even Fukushima accident may give a bad effects and a deep slump to nuclear industry over the world, we believe this can give a bright light to the nuclear industry in near future for more perfect safe shutdown and cooling in nuclear power plant. This can also lead to zero defect in nuclear power plant against the natural environmental disasters like tsunami.

Conclusively, I would like to emphasize the word "盡人事待天命"(a Chinese proverb which means "We can only do our best and leave the rest to providence.") toward post-Fukushima and also would like to offer the word of consolation to the tsunami victims. Cheer up !

August 2011