

LESSONS FROM FUKUSHIMA DAI-ICHI NUCLEAR ACCIDENT

One of the important lessons from the Japanese nuclear accident is that all calculations about the probability of worst impact proved underestimate by large margin. The expected probability of most damaging impact one estimated from the past history, proved unreliable. The damages from nuclear explosion far exceeded the worst that could be imagined by the authority. Dai-Ichi Fukushima nuclear explosion proved once again that man understands of nature's laws remains far from complete. Faced with countless possibilities of fatal contingencies, the calculus of probability is of no help.

Nuclear explosion in a plant causes release of radioactive iodine 131, cesium 130, and other radio isotopes to environment. Tectonic movement of the plates under the crust of the earth remains largely unpredictable. This was the reason of the extent of the disaster and the surprise element of the event. Unpredictability about the Tsunami waves on the seas remains as elusive. The wave motion over the seas arises from uneven distribution of rainfall and temperature variation due to the sun. Global warming results in variation in temperature around the globe that is mostly unpredictable. Plants are mostly located by the sea side for convenience of drawing sea water form cooling the plants. Radionuclides in seawater was reported from Fukushima plant's discharge canals, from coastal waters five to ten kilometers south of the plant, and from thirty kilometers offshore, according to Buesseler, a chemical oceanographer at the Woods Hole Oceanographic Institution¹. Radioactive contamination of sea water from the discharge canal of the plants did not cause serious concern so far because of negligible effect from operation of the plants. The scale of accident at Fukushima Dai-Ichi nuclear plants led to severe contamination of sea water. The danger of radioactive contamination of the sea water increases enormously when a number of nuclear plants suffer from accidents simultaneously as in Japan.

Intensity of radioactivity in the sea water around the nuclear plant in Japan increased sharply and spread over a large area of the sea water. This was largely due to the efforts of the nuclear operators to quench the fire in the plants by drawing in the sea water. The result was that a larger area of sea water turned radioactivity contaminated. The Japanese government decided to raise steel wall from the sea bed to the surface to contain to the contaminated sea water. The operation cost a huge amount which only rich State like Japan could afford.

The danger from citing of a number of nuclear plants in a neighboring region raises high the probability of convection of heat from accident in one plant transported to a neighboring one as happened in Japan. There were 4 nuclear power plants, each with capacity of 1100 MW at the Fukushima power station. Fukushima was located at the city of Sendai, 373 kilometer's distance from Tokyo. 4 out of 6 nuclear plants o Fukushima were operating at the time of the accident. The other two units were not operating then.

Nuclear power accident can result in the release of an uncontrollable force of destruction. Mankind should abandon the path of nuclear options and devote more resources and attention to develop the alternative renewable energy resources.

There are reasons to be concerned about the condition in India in this respect. The Government of India proposes to install 12 nuclear power plants in India within a decade. It is admitted by the Minister of Environment, Jairam Ramesh, that it is necessary to review the projects in view of the accident at Fukushima Dai-Ichi. However, one cannot abandon nuclear plants altogether. Verdict seems to have been declared before the review was concluded.

The proposed nuclear power plant at Haripur in West Bengal is expected to have 6 nuclear reactors, each of capacity 1000 Megeawatt electricity. Total installed capacity comes to 6000 MW. About 1000 acres of land will have to be acquired in the first phase only. Junput fishing harbour would fall in this zone. According to a survey by Anuradha Talwar, 1059 families in 26 villages live within the 2 km radius that has been marked by the authority presumably for the nuclear plant. Pradeep Chatterjee, secretary, National Fishworker's Forum, referring to the acceptability level of 7 degrees Celsius temperature rise in the Bay of Bengal as determined due to discharge of plant water, apprehended that fishes would migrate and a lot of marine species will face extinction within 500 meter to 1km radius of the discharge point. At least 15,000 to 20,000 people will be directly affected in the fishing industry. (The Statesman, 23 May 2011)

A second cite for installation of nuclear power plants at Jaitapur, in the coastal region of the State of Maharashtra, is in the Seismic Zone 4, a high damage risk prone zone. Jaitapur nuclear plant is proposed to be of 10000MW capacity, the biggest in the world. According to Ben Doherty, of the Sydney Morning Herald, the 6 reactors, each of capacity above 1400MW, are Pressurized Water Reactor (PWR), manufactured by Areva of France. PWRs are not working anywhere in the world. The Jaitapur zone had 22 earthquakes in past two decades. The last one, an 8.3 magnitude quake occurred two years ago, in 2009. 831 hectares of farmland, having 10,000 people, farmers and fishermen, will be affected immediately.

Our knowledge about nature's laws is far too inadequate to forecast possibilities of events like Fukushima Dai-Ichi nuclear power accidents. It behooves the scientists to seriously consider if the future plans for installing nuclear power plants should not be abandoned.

1. From Gordon Edwards ccnr@web.ca. 21 May 2011

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