23 nuclear power plants are in tsunami risk areas

Eurekalert!

The tsunami in Japan in March 2011 unleashed a series of negligence related with the resulting nuclear disaster. A scientific study headed by Spanish researchers has for the first time identified those atomic power plants that are more prone to suffering the effects of a tsunami. In total, 23 plants are in dangerous areas, including Fukushima I, with 74 reactors located in the east and southeast of Asia.

Tsunamis are synonymous with the destruction of cities and homes and since the Japanese coast was devastated in March 2011 we now know that they cause nuclear disaster, endanger the safety of the population and pollute the environment. As such phenomena are still difficult to predict, a team of scientists have assessed "potentially dangerous" areas that are home to completed nuclear plants or those under construction.

In the study published in the 'Natural Hazards' journal, the researchers drew a map of the world's geographic zones that are more at risk of large tsunamis. Based on this data, 23 nuclear power plants with 74 reactors have been identified in high risk areas. One of them includes Fukushima I. Out of them, 13 plants with 29 reactors are active; another four, that now have 20 reactors, are being expanded to house nine more; and there are seven new plants under construction with 16 reactors.

"We are dealing with the first vision of the global distribution of civil nuclear power plants situated on the coast and exposed to tsunamis," as explained to SINC by José Manuel Rodríguez-Llanes, coauthor of the study and researcher at the Centre for Research on the Epidemiology of Disasters (CRED) of the Catholic University of Leuven in Belgium. The authors used historical, archaeological, geological and instrumental records as a base for determining tsunami risk.

Despite the fact that the risk of these natural disasters threatens practically the entire western coast of the American continent, the Spanish/Portuguese Atlantic Coast and the coast of North Africa, the Eastern Mediterranean and areas of Oceania, especially in South and Southeast Asia are at greater risk due to the presence of atomic power stations.

For Debarati Guha-Sapir, another coauthor of the study and CRED researcher, "the impact of natural disaster is getting worse due to the growing interaction with technological installations."

China: a nuclear power in the making

Some 27 out of 64 nuclear reactors that are currently under construction in the world are found in China. This is an example of the massive nuclear investment of the Asian giant. "The most important fact is that 19 (two of which are in Taiwan) out

of the 27 reactors are being built in areas identified as dangerous," state the authors of the study.

In the case of Japan, which in March 2011 suffered the consequences of the worse tsunami in its history, there are seven plants with 19 reactors at risk, one of which is currently under construction. South Korea is now expanding two plants at risk with five reactors. India (two reactors) and Pakistan (one reactor) could also feel the consequences of a tsunami in the plants.

The ghost of Fukushima

"The location of nuclear installations does not only have implications for their host countries but also for the areas which could be affected by radioactive leaks," as outlined to SINC by Joaquín Rodríguez-Vidal, lead author of the study and researcher at the Geodynamics and Paleontology Department of the University of Huelva.

According to the study, we should learn our lessons from the Fukushima accident. For the authors, prevention and previous scientific studies are the best tools for avoiding such disasters. "But since the tsunami in 2004 the Indian Ocean region is still to take effective political measures," warn the researchers.

The Fukushima crisis took place in a highly developed country with one of the highest standards in scientific knowledge and technological infrastructure. "If it had occurred in a country less equipped for dealing with the consequences of catastrophe, the impact would have been a lot more serious for the world at large," claim the experts.

Therefore, Professor Rodríguez-Vidal recommends the drafting of more local analyses that consider the seismic amplification of each nuclear power plant and determine the adaptation of installation identified in the study.