How does the National Tsunami Alert System in México work?

The National Tsunami Alert System (SINAT) in México was created as a response to the need of counting on an early tsunami alert system within the country which would establish adequate mechanisms to meet different needs such as alerting the population before the occurrence of this natural phenomenon, the prevention of false alarms, the achievement of mutual collaboration among the different entities of the Federal Government and internationally recognized academic institutions.

Mexico is located along the Mesoamerican Trench, a highly seismic region where local tsunamis are likely to occur and provoke damages in our country, apart from those risen by the impact of distant tsunamis generated in other regions around the world.

For such reasons, the Mexican Ministry of the Navy along with the State Department (through the General Direction of Civil Protection and the National Center for Disaster Prevention), the Mexican Ministry for Communications and Transportation (through the Mexican Institute for Transportation), the National University of Mexico (through the National Seismologic Service and the Tide Gauging Service) as well as the Center for Scientific Research and Upper Education in Ensenada, Baja California (which counts on wide experience in tsunami research) have altogether implemented the necessary mechanisms for establishing the National Tsunami Alert System.

On May 2012 the Mexican State Department published on the National Official Bulletin, the decree for the creation of the National Tsunami Alert System (SINAT) which aims for:

I. Invigilation activities and the alert to the population about the occurrence of tsunamis generated anywhere in the world that could possibly affect the national territory,
II. Generation of information and knowledge that would determine the level of risk along the littorals of the country,
III. Fostering a self protection culture so as to have the population become aware of the measurements to be adopted in case of tsunami,
IV. Training the civil protection units at both local and state levels towards the actions that must be carried out in case of emergencies derived from the impact of a tsunami in our country.

The SINAT is an entity that has thoroughly integrated structures, functional relationships, methods and procedures among dependencies from both the Federal Public Administration and Mexican Academic Institutions in order to operate a detection, monitoring and forecasting system that provides opportune information regarding the generation of local, regional and distant tsunamis with a certain degree of likelihood to affect the Mexican coasts. The purpose is to mitigate the potential effects in the loss of lives and property and reduce it to the minimum.

In order to achieve its objectives, the SINAT has created five group works, integrated by its founding institutional members and some other entities whose involvement is determined in terms of the appropriateness of their participation. This has lead SINAT to continue to achieve the establishment of a strong, solid and reliable system.

Group 1 is responsible for monitoring and detection; Group 2 works on risk assessment; Group 3 is bound to alert and communication systems; Group 4 is focused on spreading strategies; and Group 5 is in charge of the legal area.

SINAT´s operational branch is under responsibility of the Tsunami Warning Center (CAT) created on September 19th., 2011 by means of an Agreement of the Mexican Ministry of the Navy with the purpose of counting on a specialized area for processing and analyzing the information provided by the systems that monitor seismic activity and sea level (coastal and oceanic) at real time, by making use of a permanent communications network that also includes international systems for tsunami alert.

As for assuring the operational continuity, this structure from SINAT works 24 hours a day, 365 days a year and counts on a vehicle holding the availability of informatics and communication means which are parallel to those present at CAT`s facilities.

The issuance of information, cancelation and tsunami alert bulletins, follows well defined and strict protocols as for what criteria and what procedures must be applied by individuals in the occurrence of a tsunamigenic seism.

In this sense, every time a seism takes place in the national territory, the National Seismologic Service sends CAT all the general information related to the event. At CAT, the information is assessed as for determining the tsunamigenic potential of the seism, and according to its procedures: thresholds for the issuance of bulletins, the Tsunami Synthesis Method; creates and disseminates the information through redundant means to both the military and civilian authorities of the federal government. In case of need to alert the population it is the National Center for Disaster Prevention the entity in charge of doing so, making use of the information issued by CAT.

The dependencies that integrate the SINAT count on redundant means of communication for both the transmission and the reception of information as for providing the population with bulletins about tsunamis.

In order to reinforce and confirm the information about seisms, extra data is obtained from the United States Geological Service (USGS) and the Pacific Tsunami Warning Center (PTWC) not only for those seisms which could generate a local tsunami, but also for those which could lead to regional o transoceanic tsunamis.

In the other hand, CAT counts on real time at sea level information, which permits the detection and the study of abnormalities in sea level, which would also lead to the confirmation or the cancelation of the alert. This information is provided by the National Tide Gauging Network, which is compound of four (4) independent networks, all of them managed by the Mexican Minister of the Navy, the Scientific Research and Upper Studies Center in Ensenada, Baja California; the Mexican Institute of Transportation and the National Autonomous University of Mexico.

Nowadays, the SINAT is working on the federal rulings for the signalization of vulnerable coastal zones and the specifications and installation of seismic networks and it is also working on training courses for the municipal and state civil protection units about tsunamis.