2025 IERE-TPC Taipei Net-Zero Workshop
May 26–29, 2025

Improvement on The Hamaoka Tsunami Observation and Prediction System in Hamaoka Nuclear Power Plant

***Kosuke WATANABE[1)], Kenji MURANAKA[2)]**
[1)]Researcher, Nuclear Safety Research & Development Center, Chubu Electric Power Co., Inc.
[2)] Manager, Nuclear Safety Research & Development Center, Chubu Electric Power Co., Inc.

Keywords: *Tsunami Prediction, GPS buoys, DONET, Oceanographic Radar, Infrasound Waves*

Abstract

Chubu Electric Power (CHUBU) operates Hamaoka Nuclear Power Plant (HAMAOKA), which is along the coast. Therefore, we have worked on various tsunami countermeasures same as other companies. As one of the countermeasures, CHUBU developed a brand-new tsunami observation and prediction system named “HTOPS”, which stands for “The Hamaoka Tsunami Observation and Prediction System” in 2020. HTOPS can predict maximum tsunami height, tsunami arrival time and disappearance time in front of HAMAOKA. HTOPS consists of GPS buoys, DONET, and oceanographic radar as observation equipment. The GPS buoys, which are operated by a ministry, are for sea water levels observation. DONET which is operated by a national research institute, is for acceleration and water pressure observation at sea bottom. The oceanographic radar is for wave velocity observation, and it was installed at HAMAOKA. HTOPS aims to support the head of HAMAOKA to make decision for refuge.

We face a problem which if tsunamis occur at locations far from the observation equipment, it takes about ten minutes for HTOPS to predict tsunamis in case of the Great Nankai Trough Earthquake and Tsunami. The ten minutes are connected directly with the delay of the refuge order. To solve the problem, we are considering utilizing infrasound waves, which are generated by tsunamis and travel faster than tsunamis. Since the infrasound waves were observed during the Great East Japan Earthquake and Tsunami, researchers have studied how to utilize them. We simulate HTOPS adding the observed infrasound waves. HTOPS can make tsunami predictions significantly faster. We continue developing HTOPS to install observation equipment on infrasound waves.