

VANUATU: ELECTRONIC SIRENS FOR TSUNAMI WARNING

Together with the local partner Vaté Electrics, HÖRMANN Warnsysteme planned and installed a tsunami siren warning system for Vanuatu.

The general challenges for tsunami siren warning systems for islands in the Pacific region are:

- Installing the electronic sirens in hard-to-reach locations
- Establishing a reliable communication infrastructure
- Ensuring reliable operation independent of the power grid
- Hassle-free installation by local partners
- Durability and minimal maintenance to keep follow-up costs low for local operators
- On-site training
- Immune to external influences such as high wind speeds, solar radiation, earthquakes, humidity and salty sea air

Special project requirements: Tsunami sirens for Vanuatu

The island nation of Vanuatu is located on the Pacific Ring of Fire with nine active volcanoes. The threat of volcanic eruptions and earthquakes is imminent and with it the danger of tsunamis. The Vanuatu Meteorology and Geo-Hazards Department (VMGD), based in Port Vila (Efate), wanted to

protect the population with the help of a siren warning system. The tsunami sirens were to be installed in the more populated areas on the main island of Efate as well as on Espiritu Santo. The specific requirements for the siren warning system were:

- Central and local triggering
- Redundancy of the siren control centres
- Operational independently of the power grid
- Low follow-up costs due to longevity and minimal maintenance requirements
- Installation on masts must withstand wind speeds of up to 270 km/h, as Vanuatu is also regularly hit by strong cyclones
- Training of VMGD staff at the siren control centres and on site



Implementation

The decision on siren locations was supported by a sound planning prognosis that took local conditions into account. The siren control centres were designed in such a way that the control centre in Port Vila can trigger the sirens on Efate as well as those on the island of Espiritu Santo. The control centre on Espiritu Santo monitors and controls only the sirens on that island. Both siren control centres are fully redundant and, with the help of UPS systems, can also be used in the event of a power failure. Communication between the central systems takes place via TCP/IP over a VPN.

The electronic sirens are powered exclusively by solar panels, which charge two maintenance-free 12V batteries. This ensures constant operational reliability and the tsunami sirens are always ready to be triggered in the event of a disaster.

The electronic sirens can be triggered by means of a radio connection (VHF) via the control centre in the control room. It is also possible to activate the sirens locally directly at the site. For this purpose, the siren cabinet contains an LCD display and, alternatively, an emergency button. The system is protected against unauthorized activation.

The tsunami siren warning system consists of:

- 19 ECN 1200-D electronic sirens with 115 dB(A)/30m on the two main islands
- Installation on 11m high masts

- Two PC-based siren control centres with CCCS operating software and an RCS touch panel as alternative triggering option
- Two MCE Communication Gateways as connection between the central systems and the sirens

Project Achievements:

- The tsunami warning system in Vanuatu was realized within the specified time in 2017 and has been in operation without any problems since then
- The requirements were met to the fullest satisfaction of the responsible parties
- Problem-free, close cooperation between HÖRMANN warning systems and the local partner Vaté Electrics despite the great distance and time difference
- The siren system is low-maintenance, thus avoiding high follow-up costs, and is ready to warn the population

Contact: HÖRMANN Warnsysteme, Martin Graf, Sales & Projects Manager, info@hoermann-ws.de