



EARLY NOTIFICATION SOLUTION SAVES LIVES ON VOLCANO'S EDGE

Not all danger near a volcano is from lava flows. When New Zealand's Mount Ruapehu's crater fills with water between eruptions, the crater walls can collapse, causing tons of flood water, mud and sulfur to suddenly flow down the mountain. How were government officials supposed to know when the crater collapses and deadly flood waters were on their way? They worked with WIN-911 to develop a technology solution for early notification and saved lives.

The Problem

Mount Ruapehu in New Zealand is the most active volcano in the world. Major eruptions occur about every fifty years, with 60 or more minor eruptions since 1945. To add to this hazardous situation, the volcano's crater periodically fills with water between eruptions causing the crater wall to collapse and release flood water and mud down the mountain onto inhabited areas.

On Christmas Eve 1953 such a flood, called a lahar, washed an overnight train off a bridge, leading to the loss of 153 lives.

The Solution

Eruptions in 1995 and 1996 created a weak crater dam that was sure to break at some point. So government authorities decided to seek a technology solution to avert the kind of disasters that led to the loss of lives in the past.



Working with Auckland-based Industrial Interface Company, a WIN-911 Solutions Provider and others, the Eastern Ruapehu Lahar Alarm and Warning System, or ERLAWS was developed. ERLAWS consists of three sites at which various geophone and water level sensors are located. These sites include Crater Lake, the New Zealand Alpine Club hut and near the Tukino ski field.

ERLAWS was programmed to automatically warn of the floods and activate barrier arms to close roads and bridges in the flood's path. WIN-911 alarm notification software alerts police, council staff, transportation authorities and scientists to avert a disaster. Local residents could even sign up to receive alerts from WIN-911 directly. The warning system, including all equipment, software, labor, and engineering cost approximately \$375,000.

Solution Put to the Test

On March 18, 2007, a tephra dam collapsed, causing a “medium” sized lahar which flowed down the mountain and into the Whangaehu River. The ERLAWS system activated at 10:47am and worked exactly as planned. Scientists estimate that 1.29 million cubic meters of sulphur and water went down the Whangaehu Valley. Police and Civil Defense workers immediately closed roads around the southern side of the mountain, where the flood was heading and evacuated nearby residents. Thanks to the fast work by local authorities, notified by ERLAWS, there were no reports of injuries. This lahar was at least 50% larger than the 1953 lahar that caused the Tangawai disaster.



New Zealand’s Civil Defence Minister Rick Barker said, “We put trust and faith in the engineers and the engineering

solutions, and it appears that trust has been well placed. The warning systems worked as designed ... the alerts went to the rest of the community and people adopted the appropriate procedures.”

Chris Carter, New Zealand’s Minister of Conservation added, “The early warning response system that this government provided worked exactly as planned. The management system for the Mount Ruapehu lahar is the international best practice for this type of natural event.”

To learn more, visit the WIN-911 website at www.WIN911.com.