telegrafia®

Early warning
of tsunamis, tornadoes, and other natural disasters

Why build a system to warn of natural hazards?

Nature is becoming increasingly erratic, demonstrating its power through natural elements threatening our planet. Disaster scenarios are written almost daily, affecting people regardless of their location, status, or preparedness for what is to come. Early warning and notification systems include acoustic warning components, primarily electronic sirens and monitoring systems with sensors. Thanks to these components, they can essentially eliminate losses, at least in human lives.

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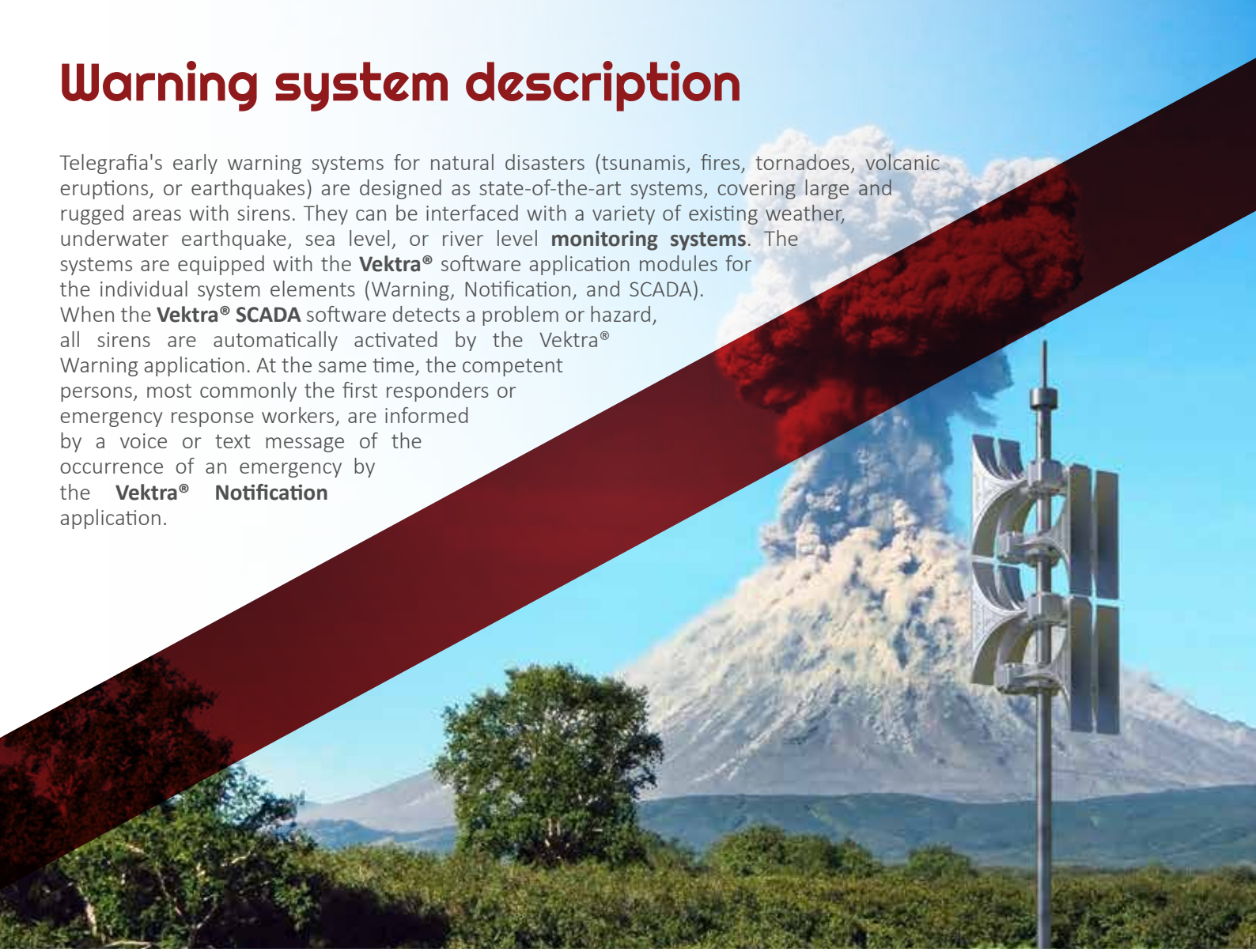
Warning system description



Telegrafia's early warning systems for natural disasters (tsunamis, fires, tornadoes, volcanic eruptions, or earthquakes) are designed as state-of-the-art systems, covering large and rugged areas with sirens. They can be interfaced with a variety of existing weather, underwater earthquake, sea level, or river level **monitoring systems**. The systems are equipped with the **Vektra®** software application modules for the individual system elements (Warning, Notification, and SCADA). When the **Vektra® SCADA** software detects a problem or hazard, all sirens are automatically activated by the Vektra® Warning application. At the same time, the competent persons, most commonly the first responders or emergency response workers, are informed by a voice or text message of the occurrence of an emergency by the **Vektra® Notification** application.

Early warning systems for tsunamis, tornadoes and other natural hazards include:

- Monitoring system
- Control centre
- Pavian electronic sirens
- Communications infrastructure
- Notification

Advantages of the solution

- Wide area coverage in any environment thanks to the reliability of electronic sirens and the strength of their acoustic warning signal
- Direct connection of sensors and sirens without additional hardware
- Possibility of using data obtained from meteorological and hydrometeorological stations and their automatic evaluation
- Automated control of other SCADA devices based on monitoring outputs (e.g. shutting off the gas supply)
- Automatic activation of early warning and notification
- Simplification of the evacuation process thanks to the possibility of live announcements, text-to-speech function, and excellent intelligibility of the spoken word
- Playback of audio recordings from the siren memory or external sources
- Intelligent operation thanks to silent siren tests, remote self-diagnostics, and the possibility of interfacing with third-party systems
- The full operation, even in the event of a power failure using solar panels

1

Monitoring system

2

The monitoring system consists of a set of sensors relevant to a specific solution for protection against one of the natural elements. Whether it is a network of ocean buoys to detect an underwater earthquake or motion and seismic sensors below the earth's surface, the sensors can be connected to Pavian sirens or EMA monitoring station. Then the acquired data is transmitted to a control centre.

3

Control centre

Each control centre has a Vektra® software application that collects, analyses, and evaluates all the data obtained from the sensors. If necessary, for example, when threshold values are exceeded, it automatically activates the Warning or Notification modules. When critical values are reached, it activates them simultaneously. In addition, the software application can guarantee high security by backing up the entire technology.

4

Pavian electronic sirens

Pavian electronic sirens can cover large areas with an acoustic signal regardless of location. The extensive coverage range is complemented by their excellent intelligibility even when reproducing the spoken word. They emit an acoustic warning signal before a catastrophic scenario arises and enable the coordination of the affected population after it has occurred, thanks to the voice messaging, text-to-speech, and live reporting functions. Each siren can be activated individually or as part of a group and controlled locally or from a control centre. Pavian sirens do not require an external power source when using solar cells.

5

Communication infrastructure

The communication infrastructure ensures communications between the control centre and the components of the warning, notification, and monitoring system. Also, it enables the interconnection of this system with third-party systems.

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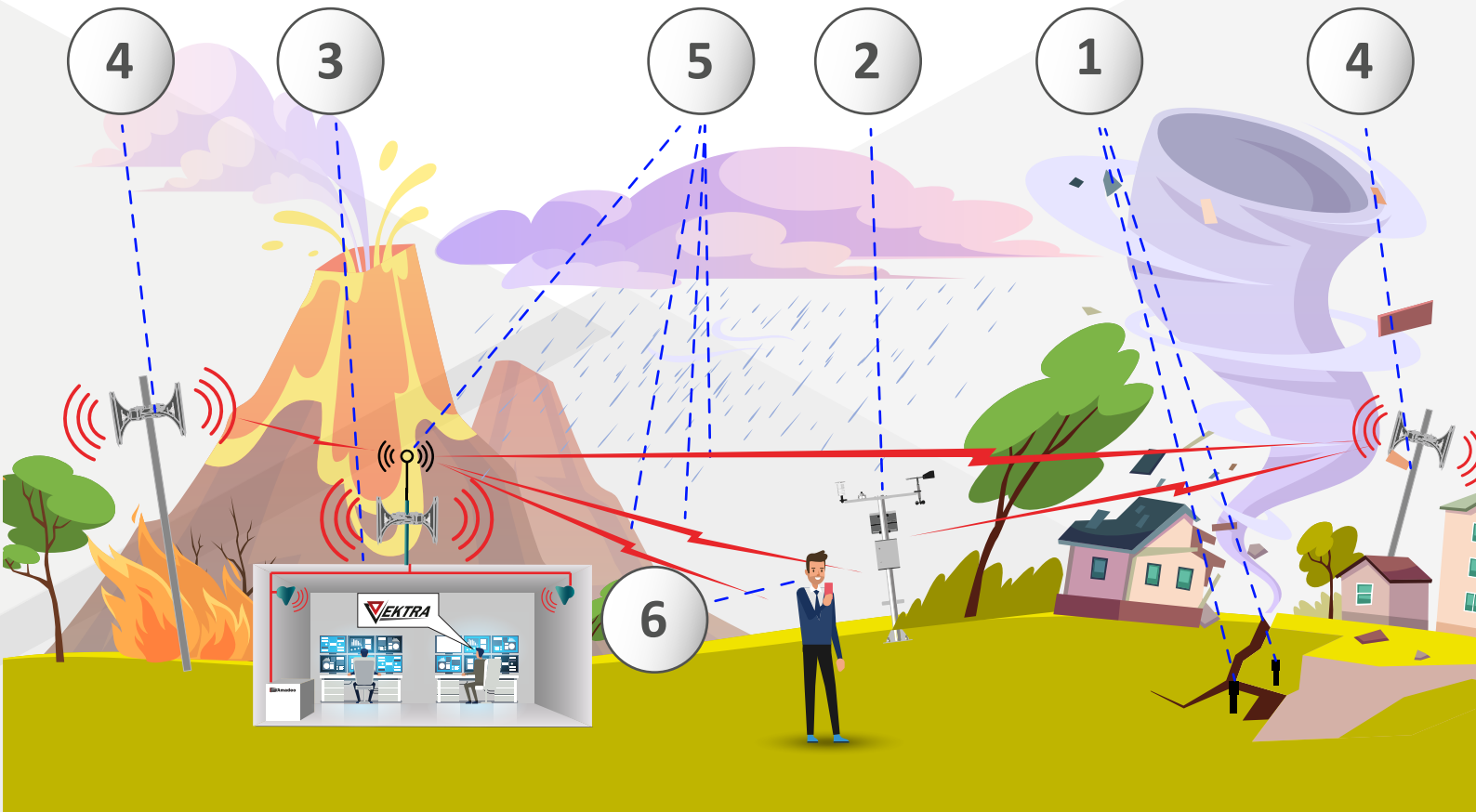
Notification

Responsible persons are informed of the occurrence of an emergency by telephone or SMS and, if necessary, summoned to workplaces and rescue operations.



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