

Warning systems for nuclear power plants



Why build warning systems in nuclear power plants

To generate electricity, nuclear power plants burn atomic fuel, and this is a hazardous substance. It is necessary to **take great care** while manipulating with the fuel and **adhere to stringent safety regulations**. Although the energy production process is technologically well-managed, there is still a **considerable risk of radioactive substance leakage** inherent in the process.

Technological breakdowns and potential industrial accidents in nuclear power plants pose serious **health risks for the employees, local population, and the environment**. To minimise such risks, all nuclear power plants in the world build **systems that monitor the occurrence of radioactive substances**, accompanied by **warning and notification systems**.

Telegrafia offers you a top-quality, reliable, and practically well-tested warning system that complies with the most demanding requirements placed on nuclear power plants. In addition to its reliability, the strength of the system is the remarkable speed of alarm activation, enabling the system to issue a siren warning **within several seconds**.



Warning System

Medium



Acoustic Coverage

Exterior / Interior

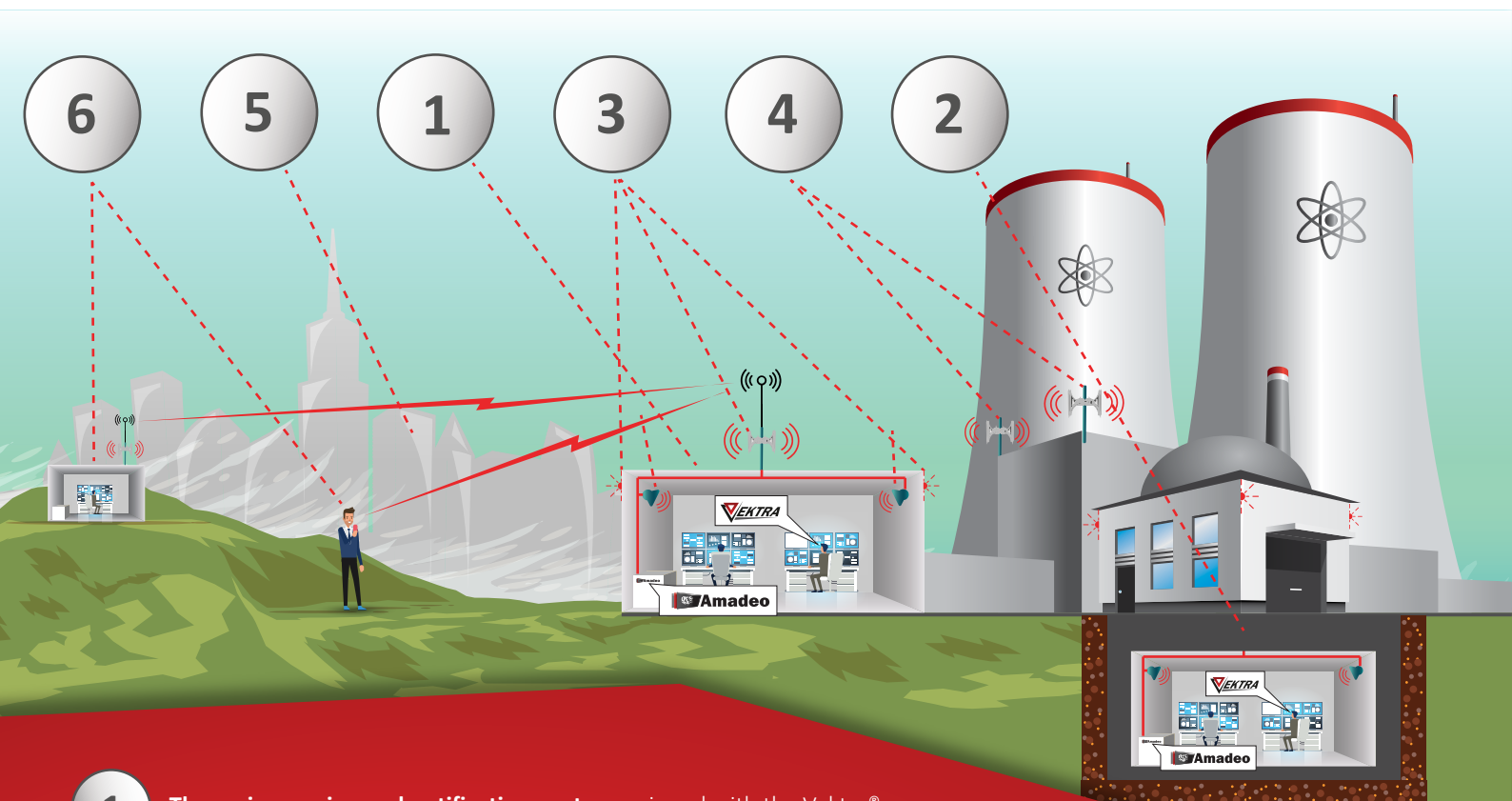
**Sound an early warning of an emergency to the employees
and population living in the vicinity of a nuclear power plant**

Description of the warning and notification solution for nuclear power plants

Early warning and notification systems for nuclear power plants are large warning systems that are built within a distance of approximately 20 km away from the power plants and use hundreds of electronic sirens. The systems meet all the relevant requirements for their reliable operation in the typically demanding environments of nuclear plants.

- **The nuclear power plant warning system** covers the territory of a nuclear power plant with a warning signal within a range of several tens of kilometres. It can be activated from either of the two fully independent and physically remote control centres (the main or backup centre), or possibly from the superior national control centre.
- **The notification system** automatically summons emergency services and informs the responsible staff of an emergency by sending a voice or text message.

Components of warning systems in nuclear power plants



- 1 The main warning and notification centre** equipped with the Vektra® software applications that:
 - Continuously monitors the status and operability of the entire warning system
 - Is connected to a monitoring system and sensors, not only monitoring specific technological parameters of the system, but also the meteorological conditions and seismic activity in the area, which could affect the operation of the nuclear power plant
 - In the event of the detection of critical levels of measured values by the monitoring system, or potential danger of an accident
 - **Automatically activates the necessary warning operations and visual warning signalisation**
 - In the event of a large-scale emergency
 - **Automatically activates the notification process**, i.e. the summons of the responsible persons/first responders for action and the notification of the relevant institutions
 - Makes and keeps records of all communications in the main warning and notification centre for future analysis
 - Guarantees **tight security** thanks to **100 per cent secure back-up technology**

Visual and Acoustic
Warning



Preset time for the
operator's response



Automatic start of the notification
and electronic sirens



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A backup warning and notification centre that:

- Remains operational simultaneously with the main warning and notification centre
- Is technologically equivalent to the main centre
- Can take control of the system management manually or automatically when necessary or in case of the main control centre breakdown (i.e. it is in standby mode)

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An internal and external Amadeo PA system whose:

- Units are installed in the individual operations to provide early warning in several separated buildings parts within the area of a nuclear power plant
- Units work as autonomous devices and respond locally to specific operational conditions
- Units can work independently irrespective of any potential failure in the control centre or communications breakdown
- Units are supplied with 100 V sound distribution lines and loudspeakers for the sound transmission in the internal premises with common background noise levels, or loudspeakers for the sound transmission in noisy halls and external operational units
- Efficiency in noisy industrial units can be enhanced by using beacons for visual signalisation
- Units are equipped with all autodiagnostic functions and modules

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The Pavian electronic sirens that:

- **Produce a high acoustic pressure** over a great distance
- **Ensure perfect intelligibility** of live voice reproduction
- **Demonstrate their high reliability** due to:
 - o their full operability even in case of a power failure
 - o their full functionality in extreme temperatures
 - o advanced autodiagnostic functions
- **Allow using multiple power-supply methods**
- **Provide communications** with the control centre via **radio and line communications channels**
- Can also be controlled **locally** from local control units (by municipality mayors)

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A communications infrastructure that:

- Consists of the main, backup, and local control units where
 - o The main communications unit communicates with local units and the sirens within direct reach
 - o Local communications units communicate with specifically located sirens and primarily work as concentrators to accelerate the response time of the entire system
- Ensures communications between the control centre and other elements of a warning system
- Allows the connection of the early warning system in a nuclear power plant to the superior national/municipal early warning system

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A network of responsible persons/first responders that are:

- Informed of the occurrence of an emergency by phone or text message
- Urgently summoned to their offices or operation headquarters for rescue operations



Feel safe with our reliable solution

A photograph of a nuclear power plant with three large cooling towers emitting steam, set against a sunset sky. The image is partially obscured by geometric overlays: a red triangle at the top, a grey triangle on the right, and a white triangle at the bottom containing contact information. A complex geometric pattern of various colored triangles is on the left side.

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