| PGA Value (g) | Intensity of Seismic Activity | Colour Indication |
|---|---|---|
| PGA <= 0.039 | Not Felt/Weak | Cyan |
| 0.039 < PGA <= 0.18 | Moderate | Amber |
| PGA > 0.18 | Strong | Red |

## Ideal For

Airports, Railways, Metro, High-speed Train Network, Refineries, Petrochemical Plants, Fertilizers, Chemical Plants, Nuclear Power Plants, Mines, Caverns, Smart Cities, Infrastructure, Public Emergency Services etc.

## Customised Solutions

Depending on specific project requirements, EIL experienced professionals along with our technology partner CSIR-CSIO are ready to provide with the best advice and support from the outset. Our knowledge of earthquake early warning, seismic monitoring and rapid response systems coupled with an in-depth understanding of our instruments will provide you with an unparalleled advantage to achieve the best results for your requirements on time and on budget.

## Our Services

**Professional Advice and Support from concept to commissioning**

- Consulting
- Technical Proposal
- Commercial Offer
- Planning
- Installation
- Training
- Maintenance

## Contact us

For a comprehensive consultation and discussion on your requirements.


इंजीनियर्स इंडिया लिमिटेड (भारत सरकार का उपक्रम)
ENGINEERS INDIA LIMITED (A Govt. of India Undertaking)

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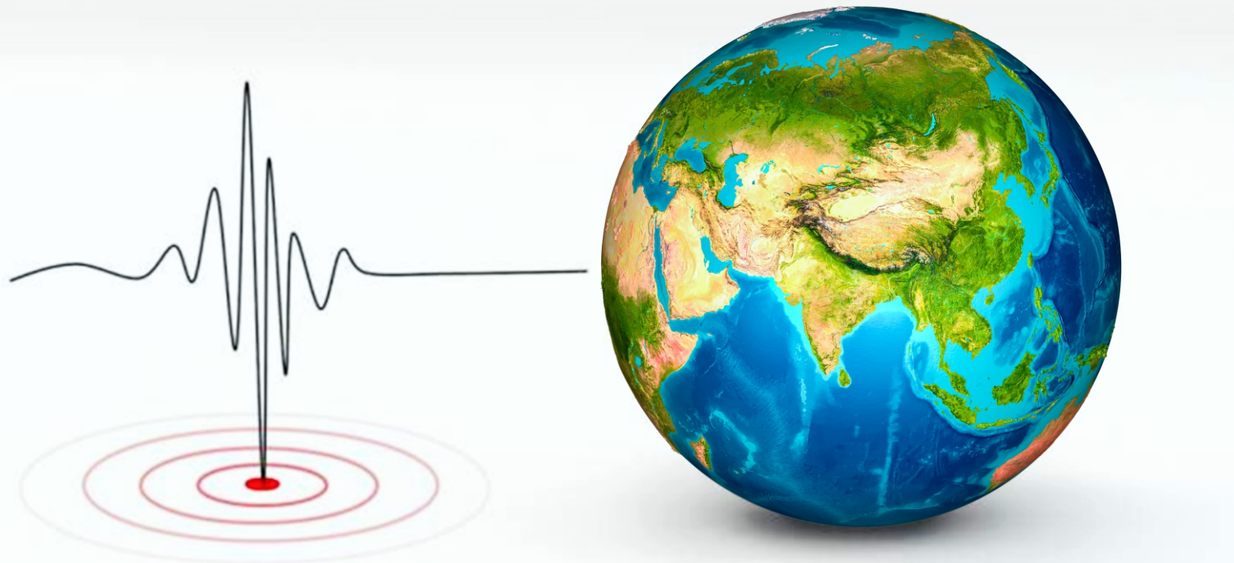
Net Zero by 2035

# EARTHQUAKE WARNING SYSTEM

**Powered by EIL**



**Technology Partner**

CSIR- Central Scientific Instruments Organisation

**AWAKE BEFORE IT SHAKES!! TAKE CARE!**

# EARTHQUAKE WARNING SYSTEM (EqWS)

There is no proven method to forecast the precise occurrence time of an earthquake nor its location or size. Yet, utilizing state of the art scientific methodologies as done in EIL Earthquake Warning System (EqWS), it is now possible to quite accurately assess Peak Ground Acceleration (PGA) values as soon as an earthquake emerges from its primary waves. Thus early warnings about a potential strong shaking can be generated almost instantaneously, until destructive secondary and surface waves arrive.

Based on fast and reliable communication channels, this provides the crucial seconds to take measures which may help reduce catastrophic impacts of seismic events.

Earthquake early warning systems have been proven to be helpful tools to mitigate the industrial, social and economic impact on communities and businesses.

- Earthquake warning system (EqWS) is network of a number of seismic sensing nodes (SSN) consisting of seismic sensors, communication cards, processors etc.
- It is devised for regional notification of a substantial earthquake while it is in progress.
- SSNs communicate to the master server - EqWS Graphical User Interface for Central Control Unit (CCU) for generating alert signals.

# Seismic Sensing Node (SSN)

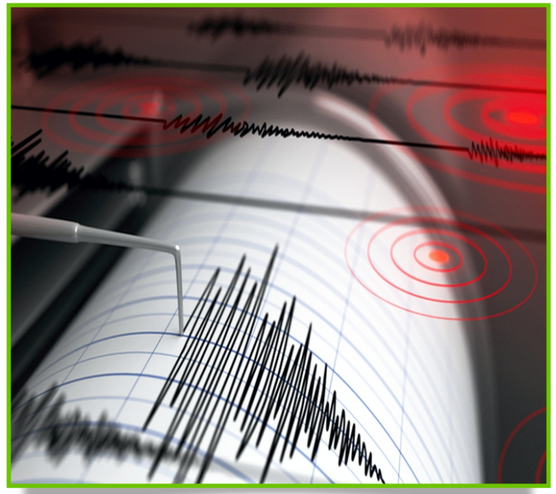
SSNs are installed at a number of identified field stations depending upon geographical coverage of vital installations.


Front panel of the developed SSN


SSN installed at one of the field stations

# Concept

The system is devised for regional notification of a substantial earthquake impending by installing a plurality of seismic sensing nodes (SSN) consisting of seismic sensors, capable of detecting local and regional seismic events. The multiplicity of such nodes ensures elimination of man-made activities at local level. SSNs are strategically located to gather information about seismic activity and quickly communicate to a Central Control Unit (CCU) regarding potential earthquake incidence. Central control provides a final decision based on the response of the individual SSNs, generates an audio visual alarm and sends the event details via email, SMS and Emergency Alert Delivery System to the concerned.



# Features of EqWS

## EqWS-Seismic Sensing Node (SSN)

SSN is equipped with accelerometer sensor, GPS, Processor and communication modules. SSNs are capable of sensing and distinguishing the cultural noise from actual seismic event.

## Graphical User Interface (EqWS-GUI)

EqWS-GUI is the main user interface which provides information regarding latest event details, event log of all seismic activities and health status of all connected seismic sensing nodes.

## Health of SSN

Several operational parameters of all the SSNs connected to this network are displayed at EqWS-GUI to depict the health of the SSN.

## Current Triggered Station

It displays details of all current triggered stations. A true event is declared on the basis of programming parameters and the Latest Event Information section is updated.

## Event Information

It displays the latest true seismic event which is sensed by more SSNs along with the Peak Ground Acceleration (PGA) sensed by the triggered SSN along with earthquake signature from the first triggered stations.

## Report

A report is generated for all the true events and programmable three levels have been defined for severity warning based on intensity.