**Illegal cross‐border tunnels (active)**  
<https://doi.org/10.1190/1.3627464>

Subsurface voids may manifest themselves as natural or anthropogenic dissolution features, illegal cross‐border tunnels, or abandoned mines. Detection of these voids using geophysical methods has often proven difficult due to multiple factors including depth‐to‐diameter ratio, lack of resolution, non‐uniqueness, etc. Experiments were conducted at a test site with a known subsurface void to determine the capability of multiple near‐surface seismic methods as applied to void detection. In this study, refraction tomography and multichannel analysis of surface wave methods successfully identified a man‐made void approximately three meters deep.

**Seismology on Mars (SEIS) (passive)**

[SEIS News - SEIS / Mars InSight (seis-insight.eu)](https://www.seis-insight.eu/en/seis-news)

[SEIS | Max Planck Institute for Solar System Research (mpg.de)](https://www.mps.mpg.de/planetary-science/insight-seis)

The Seismic Experiment for Interior Structure (SEIS) is part of the scientific payload of NASA’s InSight mission. Landing on Mars in 2018, SEIS will be the first European seismometer on another planet. The instrument is capable of recording ground motions of a fraction of 0.001 mm over a broad frequency range between 0.001 Hz and 50 Hz. In this way, it can capture signals from marsquakes, meteorite impacts, local events like dustdevils or landslides, and even the tiny tidal deformation of Mars induced by its moon Phobos. Recording and analyses of seismic waves that have been transmitted through the interior of Mars will provide important insights into the planet’s interior structure. SEIS is expected to run continuously for at least one Martian year (687 days) and collect sufficient data to address a number of scientific questions.

**Detection of underground nuclear testing (passive? Bomb is a type of trigger I guess)**

[Monitoring of Underground Nuclear Tests by Seismic Stations in the Former Soviet Union (FSU) | SpringerLink](https://link.springer.com/chapter/10.1007/978-94-011-0419-7_4)

This paper gives the total numbers of underground nuclear explosions detected and identified for each nuclear weapon state, and shows how the detection capability improved with time. The monitoring capability of the network of the Former Soviet Union (FSU) is compared with that of the International Seismological Center (ISC). Relationships between body wave magnitude and explosion yield are determined for all nuclear test sites. A discussion is given of seismic monitoring capabilities for the following International treaties, actual and proposed: Threshold Test Ban Treaty (TTBT), Peaceful Nuclear Explosion Treaty (PNET), Comprehensive Test Ban Treaty (CTBT), Non Proliferation Treaty (NPT). Analysis of 204 early unannounced underground nuclear explosions (UNE) conducted by the U.S. at the Nevada Test Site (NTS) shows that 61 of them were detected by the seismic network of the FSU. As a result of this analysis, the sensitivity threshold of seismic monitoring of UNE at teleseismic distances by seismic network stations in the FSU has been estimated more accurately.

**Designing Windparks (passive and active)**

[Seismic considerations in design of offshore wind turbines - ScienceDirect](https://www.sciencedirect.com/science/article/pii/S0267726117309363?pes=vor)

Interest in renewable and clean energy over the past decade has motivated immense research on [wind energy](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/windpower-utilization). The main issues in design of offshore [wind turbines](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/wind-turbine) in regions of recent development have been aero- and hydro-dynamic loads**; however, earthquake is a design concern in**[**seismic areas**](https://www.sciencedirect.com/topics/engineering/seismic-area)**such as East Asia and Western United states**. This paper reviews the state of practice in [seismic design](https://www.sciencedirect.com/topics/engineering/seismic-design) of offshore wind turbines. It is demonstrated that wind turbines are in particular vulnerable to vertical earthquake excitation due to their rather high natural frequencies in vertical direction; however, inclusion of the radiation damping could contribute considerably reduce the earthquake loads. Moreover, it is demonstrated how soil nonlinearity could lead to settlement and permanent [tilting](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/attitude-inclination) of offshore wind turbines on caisson foundations or tripods. Using these cases, the paper demonstrates that the design of offshore wind turbines for earthquake loading is driven by performance-based considerations.

[Geological, Geotechnical and Geophysical Aspects of Zafarana Wind Farms Sites and Their Expansion at Gabel El Zeit Sites Egypt - IOPscience](https://iopscience.iop.org/article/10.1088/1757-899X/974/1/012005)

The growing need for sustainable power generation has led to increasing number of power plants, of fossil-fuel type and of non-conventional type. **The foundation types of wind turbine towers in power plant structures are mainly depend on the geotechnical and structural considerations and other geological and geophysical considerations.** The safety and economic conditions also play a vital role in the design of foundations. **Such foundations must effectively be designed taken into consideration large overturning moments and dynamic loading due to extreme wind and earthquakes.** The present research is focused on studying the geotechnical, geological and geophysical aspects and characterizes of soils in Zafarana Wind Farms sites and their expansion at Gabel El Zeit sites on the Suez Gulf of Egypt. The study first address and study the geological aspects of both sites Zafarana Wind Farms sites and Gabel El Zeit sites. Secondly, **the geotechnical and geophysical characteristics are studied based on** establishing data base from 698 borings and 8 **seismic refraction profiles** across Zafarana wind Farm sites and 10 borings and 2 seismic refraction profiles at Gabel El Zeit site. The geotechnical testing and geophysical profiles were compiled to determine the variation of the soil profile as well as the characteristics of the soil layers within the study sites. The results showed construction of 8 representative boring logs at Zafarana Wind Farm sites and 2 representative boring logs Gabel El Zeit sites to represent the characteristics of the soil layers and site statgerphy. Also, the study shows the result of compression wave velocity and shear wave velocity across both sites and within the studied soil layers up to 30 m. All these results from this research will help to study the foundation and the structure of wind turbine tower, where these types of tall structures are similar to chimney structures in design and other engineering considerations.

**Also very interesting: Wind farms generate seismic noise**

[WES - Reduction of wind-turbine-generated seismic noise with structural measures (copernicus.org)](https://wes.copernicus.org/articles/7/1227/2022/)

Reducing wind turbine noise recorded at seismological stations promises to lower the conflict between renewable energy producers and seismologists. Seismic noise generated by the movement of wind turbines has been shown to travel large distances, affecting seismological stations used for seismic monitoring and/or the detection of seismic events. In this study, we use advanced 3D numerical techniques to study the possibility of using structural changes in the ground on the wave path between the wind turbine and the seismic station in order to reduce or mitigate the noise generated by the wind turbine. Testing a range of structural changes around the foundation of the wind turbine, such as open and filled cavities, we show that we are able to considerably reduce the seismic noise recorded by placing empty circular trenches approx. 10 m away from the wind turbines. We show the expected effects of filling the trenches with water. In addition, we study how relatively simple topographic elevations influence the propagation of the seismic energy generated by wind turbines and find that topography does help to reduce wind-turbine-induced seismic noise.