

Fact Sheet

Exelon Plants are Well-Protected From Floods, Earthquakes and Tsunamis

Exelon's nuclear power plants are designed to withstand extreme environmental hazards, including floods and earthquakes.

- The U.S. Nuclear Regulatory Commission (NRC) requires all nuclear plants to be able to withstand the most severe natural phenomena historically reported for each plant's geographic area out to 200 miles.
- The NRC requires all nuclear plant designs to include a substantial margin for safety by requiring the use of conservative criteria.
- Exelon's nuclear plants are designed to withstand substantial earthquakes even though none of our plants is in a significant earthquake zone.
 - Depending on the location, Exelon plants are engineered to withstand earthquakes between 6.0 and 6.9 on the Richter scale *at the plant site*, which translates into larger earthquakes as measured at the epicenter.
 - All of Exelon's plants are designed to withstand substantial ground motion in an earthquake.
- Every U.S. nuclear power plant performs in-depth seismic analyses and the NRC regularly reviews new information on earthquake sources and ground motion models. Regulations are modified accordingly.
- All of Exelon's plants – even the longest serving – are able to withstand and safely shut down in very strong earthquakes.

Tsunamis are not a threat to Exelon Nuclear plants.

- All but one of Exelon's 10 nuclear plants are located in Illinois and Pennsylvania.
- Our Oyster Creek plant in New Jersey on Barnegat Bay is more than 5 miles inland from the Atlantic Ocean. Tsunami events are not typical on the East Coast.
- Barrier islands five miles away would limit the energy of a tsunami prior to reaching the closest coastline to Oyster Creek.
- In addition, Oyster Creek is elevated 23 feet above mean sea level.
 - The maximum recorded high tide on the Barnegat Bay beachfront more than 5 miles away is 7 feet above mean sea level (1962).
 - Oyster Creek's elevation is greater than the probable maximum hurricane tidal surge.

Exelon plants are hardened against floods

- Emergency core cooling systems are protected from water incursion, including water tight doors, elevation of equipment above potential flood levels and/or special engineered flood barriers.
- Emergency diesel generator exhausts are elevated on roofs.
- Main fuel tanks for emergency diesels are buried underground or enclosed in buildings to prevent impact from severe environments. They cannot float away.
- Electrical switchgear for emergency operations at the plants is protected from floods by elevating them above potential flood levels or protecting them behind watertight doors.

All U.S. nuclear plants are based on a “defense-in-depth” design, which means multiple physical barriers and multiple backup safety systems ensure safe operations even in extreme environments.

- Plant foundations, structures and equipment are designed to withstand severe ground motion and flooding.
- Exelon’s Boiling Water Reactors have multiple systems to provide water to the reactor core in an emergency. Some of these systems are divided into independent subsystems that are powered by multiple redundant power sources. *In effect, all Exelon plants have six or more ways to put water into the core in an emergency.*
- Exelon nuclear plants have systems and strategies that minimize hydrogen buildup in secondary containment, which we believe was the source of explosions at Fukushima Units 1 & 3.

All Exelon Nuclear plants are able to safely shut down and keep the fuel cooled even without electricity from the grid.

- All Exelon nuclear plant systems get electricity from at least two independent power lines in the grid that feed into two independent power transformers.
- In an offsite power loss, safe shutdown is ensured through multiple redundant systems specifically designed to maintain electric power when electricity is lost from the grid off site.
 - Locomotive-sized emergency backup diesel generators at plants that start automatically if offsite power is lost. Each two-reactor site has five emergency generators; each one unit site has three (except Oyster Creek, which has two diesels and two gas combustion turbine generators).
 - Battery banks to back up the emergency diesel generators.
 - Additional high-capacity generators or special equipment that back up each unit’s emergency diesel generators and battery banks.
- If a used fuel pool were to lose water – even in significant quantities -- all Exelon Nuclear sites have portable, high-capacity pumps to ensure the pools remain filled.
- Emergency water can be drawn using multiple methods from large water sources that include tanks of at least 100,000 gallons, large pools of water designed specifically to remove heat from the reactor core, cooling water lakes that frequently cover hundreds of acres, and rivers and other water sources near the plants
- All Exelon plants have “Severe Accident Mitigation Guidelines.” The guidelines prescribe actions beyond normal emergency operating procedures and address severe challenges to the reactor core of the kind seen in Japan.
- These systems are constantly tested, challenged or simulated to ensure proper operation when needed.

All U.S. nuclear plants undergo frequent scenario drills to ensure the proper function of the redundant safety protocols.

- These drills are managed and overseen by the NRC with collaboration from plant operators and other federal and local emergency agencies, including FEMA.

Beyond the physical features, Exelon plants have conservative operating procedures that place nuclear and public safety above all other factors.