



## Frequently Asked Questions on Nuclear Power Safety in the U.S.

### 1. How similar are our nuclear plants to those in Japan?

While there were similar designs in the original construction of 23 plants in the U.S., many modifications and upgrades for safety considerations have been made to our facilities based upon industry experience and strengthened regulations.

One of the key differences is in design changes to control a hydrogen buildup in the containment units – the likely cause of the explosions at Fukushima. The Nuclear Regulatory Commission, the federal watchdog of the industry, has required plants to have additional equipment and procedures in place to avert or lessen any possible damage that could come from an explosion or large fires.

Some of the units at the Japanese plants lost both off-site power and diesel generators. This is called a “station blackout.” U.S. nuclear power plants are designed to cope with station blackouts by having multiple back-up power sources at the ready. All U.S. plants are also responsible for demonstrating to the NRC that they can handle such situations in order to legally remain in operation.

### 2. Can an earthquake and/or tsunami as large as what happened in Japan happen here?

U.S. nuclear reactors are designed to withstand an earthquake equal to the most significant historical event or maximum projected seismic event – which could include a tsunami – without any breach of safety systems.

Based on scientific research, the natural disaster in Japan was unique because of the location and characteristics of the tectonic plate region where the earthquake occurred. So it is important not to extrapolate earthquake and tsunami data from one location of the world to another when evaluating these natural hazards.

### 3. Which reactors are in coastal areas that could be affected by a tsunami or earthquake?

Two plants on the Pacific Coast – Diablo Canyon and San Onofre, both in California – are in a potential tsunami hazard area, as are the South Texas and Crystal River stations on the Gulf Coast. All plants were designed to withstand tsunamis, earthquakes and other possible events.

For example, Diablo Canyon is anchored in bedrock and has safety systems and emergency reservoirs 80 feet or more above sea level. It also has the highest seismic standards of any nuclear power plant in the world. San Onofre is also protected by a 30-foot seawall, taller than that at Fukushima.

#### **4. What about other disasters, like hurricanes, flooding or tornadoes?**

As the flooding that could potentially happen from a hurricane is liable to be greater than that of a tsunami, our plants are designed to resist possible damages from such storms. And history shows that U.S. plants are very prepared to deal with tornadoes as well.

When Hurricane Katrina struck the Gulf Coast in 2005, Louisiana's Waterford Nuclear Generating Station maintained safe operation on backup diesel generators for four days until crews were able to reconnect primary power.

Additionally, Quad Cities Nuclear Generating Station in northwest Illinois was struck by tornados twice in the 1990s. IBEW members at the plant maintained safe operation of the facility, which remained functionally unscathed while buildings in the immediately surrounding area were damaged.

#### **5. What are some existing safeguards at U.S. nuclear plants that could mitigate an event like Fukushima?**

All U.S. nuclear plants undergo frequent scenario drills to ensure proper function of redundant (back-up) safety protocols. The drills are managed and overseen by the Nuclear Regulatory Commission – the federal watchdog of the industry – and other national and local emergency agencies, including FEMA. Plant operators rigorously train to be fully prepared in the unlikely event of a loss of off-site power and/or equipment not performing as intended. Operators continuously sharpen their skills once every five or six weeks with weeklong trainings dedicated to ensuring safe plant operation in the face of many different adverse conditions.

Organizations like the Institute of Nuclear Power Operations – which sets performance objectives, criteria, and guidelines industry-wide – are tasked with imagining how to respond to worst-case scenarios that plants could face, no matter how unlikely. Nuclear power plants then use this information to make appropriate upgrades, enhance safety protocols and prepare operators and other plant workers for potential crisis situations.

#### **6. What are some recent safety upgrades and protocol changes at American plants?**

Following the terrorist attacks on 9/11, U.S. plant designs and operating practices were modified to withstand scenarios such as aircraft impact, which could possibly cause a loss of off-site power and all on-site emergency power sources.

If a plant lost primary power and back-up emergency diesel power – as Fukushima did – plant operators would employ station blackout diesels, then use a portable diesel driven pump (which is stored nearby) to put water where needed. These mobile pumps can easily be transported in to make sure the reactor stays cool and does not emit radiation beyond the plant.

Another key difference is that Fukushima kept its fuel oil tanks for back-up generators stored above ground. American stations keep such tanks underground in a vault, making them resistant to flooding, even on the level of a tsunami.

Additionally, each U.S. nuclear plant has undergone an in-depth seismic analysis and was designed and built – using reinforced concrete and other specialized materials – to withstand the maximum projected earthquake estimate in its region.

#### **7. What if a power shutdown at a U.S. plant led to exposure of fuel rods, like at Fukushima?**

Every U.S. nuclear power plant has highly portable water pumps to ensure that a water supply would be able to reach fuel rods to keep them cool. This would protect from any radiation escaping the plant. Many plants have more than five different procedure options to move water into the core in such an emergency.

#### **8. How are the Nuclear Regulatory Commission and the industry reacting to the situation at Fukushima?**

The first priority is to help Japan in the wake of the crisis, while studying the situation to incorporate changes or make upgrades to our own plants and safety practices.

- Additional inspections at each plant to verify readiness for responding to extreme events
- A 90-day review to determine if any immediate regulatory actions are necessary
- A plan for longer-term review to ensure all lessons-learned are appropriately considered and dispositioned

The U.S. nuclear industry has also already begun assessments of events in Japan and is reviewing procedures at our plants. Steps include, but are not limited to:

- Verifying plants' abilities to manage major challenges by testing and retesting equipment and ensuring that plant operators and support staff have the most up-to-date qualifications
- Verifying each plant's capability to manage a total loss of off-site power and respond to potential flooding

Such measures would help mitigate an event like that at Fukushima, however unlikely.

#### **9. What expertise does the IBEW possess in the area of nuclear safety?**

The 15,000 IBEW members in the nuclear sector are not industry insiders – they're workers. They're the people who operate the plants, keep the facilities running and are responsible for being at the forefront of safety. They live with their families in communities close to nuclear power plants, so IBEW members have every reason to be as informed and proactive about making sure their stations run as effectively and safely as possible.

**10. Where can I go for more information about nuclear safety in the U.S.?**

[www.nrc.gov](http://www.nrc.gov) – Web site of the United States Nuclear Regulatory Commission, the federal agency that oversees reactor safety and security, reactor licensing and renewal, radioactive material safety and spent fuel management (storage, security, recycling and disposal).

[www.nei.org](http://www.nei.org) – A public policy group active in key legislative and regulatory issues affecting the industry.

*Information provided by the International Brotherhood of Electrical Workers, which represents more than 15,000 employees at 42 nuclear power plants across North America.*

[www.IBEW.org](http://www.IBEW.org)