

Facts about Safety and Emergency Planning Byron Generating Station April 2011

This document provides facts about safety procedures, equipment and systems related to earthquakes, flooding and other disaster preparedness at the Byron Generating Station. This is not a comprehensive review of all plant safety procedures.

Byron Generating Station is protected against earthquakes

- Exelon's 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. This is far above any historical earthquake risk data for the area.
- Byron safety systems and components are protected in reinforced concrete structures, allowing them to remain functional in earthquakes, tornados, floods or an accident internal to the plant.
- Among protected systems are those that provide emergency cooling water to the reactor and used fuel pools, emergency diesel generators and diesel fuel tanks.

Byron Generating Station is protected against floods

- Byron is designed to remain in a safe condition even in significant floods. Tsunamis are not a threat to Byron due to its location.
- Byron is situated 869 feet above sea level. The nearest body of water, the Rock River, runs at about 670 feet above sea level. The largest recorded flood in that area rose to 723 feet above sea level.
- Byron is situated 146 feet higher than the highest flood level.
- Emergency systems are protected from water incursion, including water tight doors, elevation of key equipment above potential flood levels and special engineered flood barriers.

Byron Generating Station is protected against power loss

- The plant's electricity comes from one independent switchyard (similar to a substation) that is connected to the grid by four independent transmission lines.
- Should all offsite power sources fail, four locomotive-sized emergency diesel generators and four independent battery banks ensure continued electricity for safe shutdown and safe cooling of the plant.
- The four emergency diesel generators are housed in separate rooms within a reinforced concrete structure. They start automatically when offsite power is lost and can run continuously for months if needed.
- The generators are fueled by four underground diesel fuel tanks with a total capacity of 44,000 gallons, a seven-day supply on-site at all times. Pipes and pumps run underground to the diesel generators. The station has plans for replenishing diesel fuel supplies in a natural disaster.
- Byron has four banks of large emergency batteries in four locations within the plant to provide emergency backup power for at least four hours should all diesel generators become unavailable.
- The emergency diesel generators are tested monthly. Batteries are inspected weekly.

Byron Generation Station is protected against hydrogen build up

- Byron Generating Station has systems and strategies that minimize hydrogen buildup inside the plant, believed to be the cause of explosions in the Japanese Fukushima plants.
- These systems and strategies include venting containment via the containment purge system and a hydrogen recombiner system that converts hydrogen into water, thus avoiding gas buildup.

Byron Generating Station water resources

- Byron has four independent methods of putting water into the reactor if needed.
- Byron has seven independent methods of putting water into the used fuel pool if needed.
- Emergency water is available from several on-site tanks holding more than a million gallons, and from the Rock River.
- If all station system pumps were unavailable, water would be delivered by diesel-driven fire protection pumps, backup “severe accident management” pumps, or fire truck pumps.

Byron Generating Station has extensive emergency plans

- Byron has extensive emergency procedures to respond to emergency conditions in order to protect the health and safety of the public and its employees during emergency events.
- Plant operators, maintenance personnel, engineers, and the emergency planning workforce verify their qualifications on a daily basis.
- Byron and all U.S. plants have in place “Severe Accident Mitigation Guidelines” that prescribe actions and require pre-staged equipment (portable diesel generators and portable power packs) beyond normal emergency operating procedures to address severe challenges to the reactor core.
- Byron conducts multiple emergency drills each year, and conducts an NRC graded drill every two years.
- Station operators are regularly trained in control-room simulators to respond to severe natural disasters that exceed the plant’s design basis.
- Station emergency drills are overseen by the Nuclear Regulatory Commission (NRC) and the Federal Emergency Management Agency (FEMA), with participation of state and local emergency agencies including the Illinois Emergency Management Agency.

Byron Generating Station used fuel facts

- Byron’s used fuel pool and dry storage casks are engineered to withstand greater than the largest earthquake ever seen in the region.
- Pool walls are three to six feet thick steel-reinforced concrete with a stainless steel liner to maintain adequate water levels at all times.

Quick facts about Byron Generating Station

- Byron Generating Station is a dual unit pressurized water reactor with a concrete steel-lined containment structure. Byron’s Unit 1 and Unit 2 provide a combined 2,432 total net megawatts of electrical capacity at full power.
- Unit 1 began producing power in 1985 and Unit 2 began producing power in 1987.
- Byron’s Unit 1 is licensed to operate until 2024. Unit 2 is licensed to operate until 2026.
- The main source of cooling water for Byron is the Rock River.
- The plant employs approximately 850 people with an annual payroll of approximately \$66 million.