

## Facts about Safety and Emergency Planning Quad Cities Generating Station October 2011

This document provides facts about safety and security procedures, equipment and systems related to earthquakes, flooding and other disaster preparedness at the Quad Cities Generating Station. This is not a comprehensive review of all facility safety and security procedures. It is meant to show Exelon Nuclear's commitment to the highest safety standards at all its facilities.

### Quad Cities Generating Station is protected against earthquakes

- Exelon's facilities are engineered to withstand earthquakes between 6.0 and 6.9 on the Richter scale *at the facility site*, which translates into larger earthquakes as measured at the epicenter. This is far above any historical earthquake risk data for the area.
- Quad Cities safety and security systems and components are protected in reinforced concrete structures, allowing them to remain functional in earthquakes, tornados, floods or an accident internal to the facility.
- Protected systems include those that provide emergency cooling water to the reactor and used-fuel pools, emergency diesel generators, diesel fuel tanks, and systems that remove heat from the reactors and ensure they retain sufficient water at all times.

### Quad Cities Generating Station is protected against floods

- Quad Cities is designed to remain in a safe and secure condition even during significant floods. Tsunamis are not a threat to Quad Cities due to its location.
- Quad Cities is situated 595 feet above sea level. The Mississippi River, the nearest body of water, runs at about 572 feet above sea level. The largest recorded flood at the station property was measured at 586 feet above sea level.
- Quad Cities emergency equipment is protected from water incursion through water tight doors that protect key components for the following systems: heat removal, service water, emergency diesel generators, cooling water, high pressure cooling injection, core spray, reactor core isolation cooling and containment spray and low pressure coolant injection.
- The elevation of safety equipment such as the diesel generators, emergency batteries and electrical switchgear are above potential flood levels and behind specially engineered flood barriers.

### Quad Cities Generating Station is protected against power loss

- The electricity to operate the facility comes from five independent transmission lines that feed the station's switchyard.
- Should all five transmission lines fail, three locomotive-sized emergency diesel generators start automatically to provide all necessary power.
- The three primary emergency diesel generators are backed up by two additional standby diesel generators.
- The three emergency diesel generators are housed in separate rooms within a reinforced concrete structure. The two backup diesel generators are housed in a separate steel-reinforced structure next to the reactor building.
- The generators are fueled by four underground diesel fuel tanks holding a three-day supply of diesel fuel. Pipes and pumps run underground from the tanks to the generators.
- The station has contingency plans for replenishing diesel fuel supplies in a natural disaster.
- Quad Cities has four banks of large emergency batteries in two locations within the facility. Each bank of batteries can provide emergency backup power for four hours to safely and securely shut down the facility.
- The emergency diesel generators are tested monthly; the backup diesel generators are tested quarterly; and batteries are inspected weekly.

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## Quad Cities is protected against hydrogen build up

- Quad Cities Generating Station has developed equipment and strategies that minimize hydrogen buildup inside the facility, believed to be the cause of explosions in the Japanese facilities.
- Systems include nuclear-grade vents that bypass enclosed structures and monitoring devices and strategies that prevent even the initial buildup of hydrogen before it can collect and become explosive.

## Quad Cities has ample water resources available instantly

- Quad Cities has 12 independent methods of safely injecting water into the reactor.
- Quad Cities has five independent methods of safely maintaining water in the used-fuel pools if needed.
- Emergency water is available from any of five tanks holding a total of 1.3 million gallons, from fire protection systems, and from the Mississippi River.
- If all station system pumps were unavailable, water can be delivered by diesel-driven fire protection pumps, backup “severe accident management” pumps and fire truck pumps.

## Quad Cities has extensive emergency plans

- Quad Cities has extensive emergency procedures to respond to emergency events that are drilled multiple times annually.
- Facility operators, maintenance personnel, engineers, and the emergency planning workforce verify their qualifications on a daily basis.
- Quad Cities and all U.S. nuclear facilities have “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.
- Station operators are regularly trained in control-room simulators to respond to severe natural disasters that exceed the facility’s design basis.
- Quad Cities conducts emergency drills each year and performs major exercises involving various off-site agencies. 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.

## Quad Cities used fuel facts

- Quad Cities’ two used-fuel pools are engineered to withstand forces 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.
- The used-fuel pools elevations are approximately 690 feet above sea level (for comparison purposes ground floor is at 595 feet above sea level).

## Quick facts about Quad Cities Generating Station

- Quad Cities Generating Station is a dual-unit Boiling Water Reactor with a concrete steel-lined containment structure. Quad Cities’ Unit 1 and Unit 2 provide a combined 1,950 total net megawatts of electrical capacity at full power.
- Unit 1 began producing electricity in 1972 and Unit 2 began producing electricity in 1973. Quad Cities’ Unit 1 and Unit 2 are licensed to operate until 2032. The main source of cooling water for Quad Cities is the Mississippi River. The facility employs approximately 850 people with an annual payroll of approximately \$66 million.