

Duane Arnold Energy Center



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The Duane Arnold Energy Center is designed with multiple, redundant safety systems.

Enhancing Nuclear Plant Safety after Fukushima



Since the devastating earthquake and tsunami in Japan, NextEra Energy Resources has taken a highly proactive approach to revalidating the safety of our nuclear plants. In addition, we have devoted significant time and focused attention to help make our facilities even safer.

Using scenarios more extreme than the Fukushima event, NextEra Energy Resources has:

Revalidated plant safety:

Dedicated thousands of hours to revalidating safety systems: Since the Fukushima event Duane Arnold Energy Center (DAEC) members have spent more than 3,000 hours performing additional safety inspections to revalidate the readiness of all critical systems, procedures and emergency training programs.

Reconfirmed the health of emergency equipment: Immediately following the Japanese emergency, we re-examined our extensive emergency procedures and tested emergency response equipment put in place after 9-11 to verify DAEC could respond to extreme events.

Ensured the availability of emergency power: DAEC conducted detailed evaluations to ensure that emergency power for redundant safety systems is fully available in the case of a Fukushima-like emergency.

Confirmed the ability to withstand extreme natural events: The DAEC team reconfirmed the plant's ability to withstand severe natural events including earthquakes, flooding and fires.

Added additional layers of safety:

Enhanced core and spent fuel cooling capability: A DAEC specific strategy has been developed, procedures implemented and equipment purchased to ensure that core and spent fuel cooling could be maintained and the impact of extreme events like Fukushima could be effectively mitigated.

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Invested nearly a million dollars in upgrades: We have invested nearly a million dollars to add additional layers of safety at DAEC. For example, we have ordered additional:

- » High-capacity pumps that run on diesel fuel (which is already safely stored on site) in order to provide additional backup cooling water for plant safety systems.
- » Diesel-powered generators capable of providing additional emergency power to monitoring, emergency lighting and communications systems.

Enhanced communication capabilities: DAEC is upgrading emergency communications equipment, including modernizing satellite phones, to ensure that communications can be maintained even if all power is lost for an extended period of time.

Updated operator training programs: NextEra Energy Resources has included lessons-learned from the Fukushima event in all plant operator and emergency responder training programs.

Full-time event response team: To effectively oversee our company's response and integrate lessons learned from the Fukushima event into plant activities going forward, NextEra Energy Resources continues to maintain a full-time nuclear Fleet response team. This team is responsible for implementing all policy changes in a uniform way across all of our nuclear plants.

Safety Confirmed by Independent Experts

"The Nuclear Regulatory Commission continues to determine that US nuclear plants are safe."

- NRC Frequently Asked Questions, February 2012

DAEC built-in safety features:

Built in a low-risk seismic zone: DAEC is located in a very seismically stable area, according to the U.S. Geological Survey.

- » **Constructed to withstand earthquakes:** The plant is designed to withstand earthquakes and other natural events stronger than ever recorded in the region.
- » **Protected from flooding:** The plant is elevated 20 feet above river level to protect against flooding.

Designed with multiple safety systems:

Redundant safety systems built into the plant design include:

- » Two diesel generators that are protected by a concrete and steel-reinforced building.
- » Additional reactor cooling system powered by steam generated by the plant itself.
- » Back-up batteries for critical safety systems are stored on-site.
- » External cooling options (i.e. injection and fire pumps) are pre-staged onsite; can use river water for cooling.
- » Seven-day power supply: Safety and cooling systems can be powered for seven days without requiring any offsite power or additional fuel.
- » Highly trained plant operators: For one full week out of every six weeks, plant operators must prove their ability to safely operate the plant in a variety of worst-case scenarios that include earthquakes, severe storms, flooding, loss-of-power, and loss of reactor core cooling.

