

## MIXED OXIDE FUEL

### Key Points

Using mixed oxide fuel in commercial nuclear power plants is an effective method for disposing of plutonium from nuclear weapons, making our world a safer place.

For Duke Energy, this mixed oxide fuel will be less expensive than traditional uranium fuel.

The use of mixed oxide fuel is a proven technology that has been used safely for decades.

### Background

In March 1999, a consortium of companies led by Duke Engineering & Services (a former business unit of Duke Energy), COGEMA and Stone & Webster (DCS) entered into a contract with the U.S. Department of Energy (DOE) to fabricate mixed oxide (MOX) fuel using plutonium from surplus weapons and then to use that fuel in commercial nuclear power plants. The consortium will design, construct and operate a MOX fuel fabrication facility at the DOE Savannah River Site. Duke Energy will use the fuel at McGuire and Catawba nuclear stations beginning around 2011 or later.

### Frequently Asked Questions

**1. What is the U.S. Department of Energy's mixed oxide fuel program?**

During the Cold War, both the former Soviet Union and the United States produced large quantities of plutonium for nuclear weapons. As part of a program to reduce the number of nuclear weapons, the United States and Russia have declared tons of plutonium as surplus. This corresponds to thousands of nuclear weapons. As required under a U.S. - Russian nuclear nonproliferation agreement, the DOE's strategy is to dispose of this material in a way that it is not vulnerable to theft, diversion or re-use in nuclear weapons by using the surplus plutonium in mixed oxide fuel.

**2. What is mixed oxide fuel?**

MOX fuel contains a small amount, less than 5 percent, of plutonium oxide blended with more than 95 percent uranium oxide. It is very similar to the conventional uranium fuel we currently use in our nuclear plants. MOX fuel assemblies will be used alongside our conventional uranium fuel.

**3. Will it be safe to use MOX fuel in McGuire and Catawba nuclear stations?**

MOX fuel has been safely manufactured, transported and used in Europe for more than 20 years. It is currently being used in about 35 European nuclear reactors, many similar to Catawba and McGuire nuclear stations.

In addition to the substantial European data on which to draw, Duke Energy is using four MOX fuel lead assemblies at Catawba before using large quantities of MOX fuel. The lead assemblies were placed into one Catawba reactor in June 2005 and will be used approximately four years. Nuclear plant operators routinely use lead assembly programs to provide added assurance that new fuel will perform as expected. Use of the four MOX fuel lead assemblies required the review and approval of the U.S. Nuclear Regulatory Commission.

**4. When will the fuel fabrication facility be built at Savannah River Site?**

The Department of Energy schedule calls for site preparation for the MOX fuel fabrication facility to begin in 2005, with significant construction beginning in 2006/2007.

**5. Who will be responsible for securing the MOX fuel transported from the Savannah River Site to Catawba and McGuire nuclear stations?**

The Department of Energy is responsible for moving the MOX fuel to our plants using its special transport system which was developed for the sole purpose of safely moving sensitive government materials across the country. Multiple layers of containers inside armored tractor-trailer trucks will be used.

**6. Will McGuire and Catawba nuclear stations have to be modified in order to use MOX fuel? If so, will Duke Energy customers have to pay for these modifications?**

The needed changes to the stations are relatively minor. They include changes in a type of chemical (boron) used in the reactor and some enhanced security measures while the MOX fuel is being received. The DOE will reimburse Duke Energy for all MOX fuel-related operating and maintenance expenditures, as well as any capital expenditures needed to modify the plants for MOX fuel use.