

## Emergency Planning and Preparedness for Nuclear Fuel Facilities

After the accident at the Three Mile Island Unit 2 nuclear power plant in 1979, the Nuclear Regulatory Commission took a fresh look at emergency planning. The NRC issued regulations requiring nuclear power plants and fuel fabrication facilities to have plans in place to protect the public during emergencies. These plans have to be in place before the agency issues a license.

After a large, toxic release of uranium hexafluoride (UF<sub>6</sub>) at the Sequoyah Fuels Corporation conversion facility in 1986, the NRC decided emergency plans for fuel facilities should also account for hazardous chemical releases. At uranium conversion, enrichment and fuel fabrication facilities the most significant accidents would be a UF<sub>6</sub> release, fire, or criticality (an unintended, self-sustaining nuclear chain reaction). There is likely to be little or no warning time before these accidents start. However, most can be controlled within roughly half an hour. Quick decisions and prompt actions are therefore necessary.

### Emergency Planning and Preparedness

Emergency planning is part of the NRC's "defense-in-depth" safety philosophy. Briefly stated, this philosophy requires:

- high quality in design, construction and operation of nuclear facilities and equipment to reduce the likelihood of malfunctions;
- safety systems to reduce the chance a malfunction will lead to an accident releasing fission products or other radioactive and hazardous materials; and
- high efficiency particulate air (HEPA) filters and other "trap" devices to prevent the release of fission products or other radioactive and hazardous materials.

Emergency planning as part of defense-in-depth gives reasonable assurance actions can be taken to protect the population around nuclear facilities in the unlikely event of an accident.

## Regulations

Fuel facility operators are responsible for preventing accidents. Should an accident happen, local public safety authorities, such as fire and police departments, will act to protect the public. The NRC requires licensees to notify those authorities immediately of serious accidents. The authorities would then notify the public.

A licensee is required to develop and submit its emergency plan to the NRC, after offsite emergency responders review the plan. NRC regulations in 10 CFR Parts [40.31](#), [70.22](#) and [76.91](#) specify that a fuel facility's emergency plan must include the following:

<ul style="list-style-type: none"><li>• Facility description</li><li>• Classification of accidents</li><li>• Mitigation of consequences</li><li>• Responsibilities</li><li>• Information to be communicated</li></ul>	<ul style="list-style-type: none"><li>• Safe shutdown procedures</li><li>• Hazardous chemical certification</li><li>• Types of potential accidents</li><li>• Detection of accidents</li></ul>	<ul style="list-style-type: none"><li>• Assessment of releases</li><li>• Notification and coordination</li><li>• Training</li><li>• Exercise</li></ul>
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Detailed guidance on emergency planning is contained in NRC's [Regulatory Guide 3.67](#), "Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities."

## Discussion

Currently, there are five operating facilities in the country involved in making nuclear reactor fuel from uranium. These are: BWXT Nuclear Operations Group in Lynchburg, Va.; Global Nuclear Fuel-Americas in Wilmington, N.C.; Nuclear Fuel Services in Erwin, Tenn.; AREVA NP, Inc. in Richland, Wash.; and Westinghouse Electric Company in Columbia, S.C. There is also the Honeywell International, Inc., uranium hexafluoride conversion facility in Metropolis, Ill., and the Shaw AREVA MOX Services, LLC mixed oxide fuel fabrication facility under construction in South Carolina.

Each facility is required to test its emergency plan once every two years in an emergency exercise with the participation of local response agencies. The NRC Incident Response Plan identifies specific individual and group responsibilities for responding to fuel facility emergencies. The NRC works closely with its licensees and with local, state, other federal, and international organizations during an incident.

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