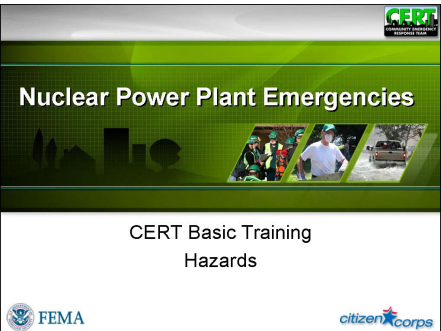
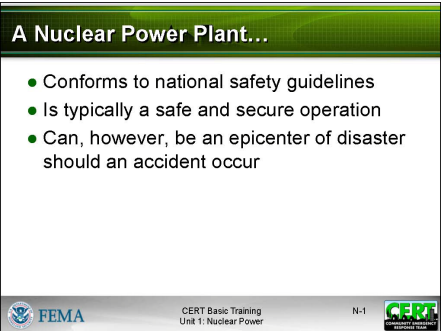
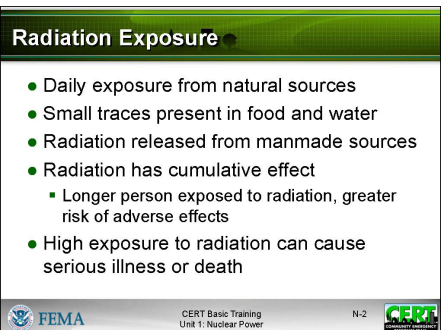


# Nuclear Power Plant Emergencies

INSTRUCTOR GUIDANCE	CONTENT
 <p><b>Nuclear Power Plant Emergencies</b></p> <p>CERT Basic Training Hazards</p> <p>FEMA citizen corps</p> <p><b>Display Slide N-0</b></p>  <p><b>A Nuclear Power Plant...</b></p> <ul style="list-style-type: none"><li>• Conforms to national safety guidelines</li><li>• Is typically a safe and secure operation</li><li>• Can, however, be an epicenter of disaster should an accident occur</li></ul> <p>FEMA CERT N-1</p> <p><b>Display Slide N-1</b></p>  <p><b>Radiation Exposure</b></p> <ul style="list-style-type: none"><li>• Daily exposure from natural sources</li><li>• Small traces present in food and water</li><li>• Radiation released from manmade sources</li><li>• Radiation has cumulative effect<ul style="list-style-type: none"><li>▪ Longer person exposed to radiation, greater risk of adverse effects</li></ul></li><li>• High exposure to radiation can cause serious illness or death</li></ul> <p>FEMA CERT N-2</p> <p><b>Display Slide N-2</b></p>	<p><b>Introduction</b></p> <p>Explain that the construction and operation of nuclear power plants are closely monitored and regulated by the Nuclear Regulatory Commission (NRC). The Federal Emergency Management Agency (FEMA) also regulates emergency planning requirements for nuclear power plants. However, accidents at these plants are possible.</p> <p>Point out that an accident could result in dangerous levels of radiation that could affect the health and safety of the public living near the nuclear power plant.</p> <p><b>What is Radiation?</b></p> <p>Explain that radioactive materials are composed of unstable atoms. These atoms give off excess energy until they become stable. The energy emitted is <u>radiation</u>.</p>

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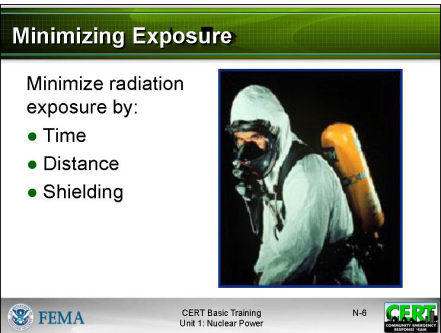
INSTRUCTOR GUIDANCE	CONTENT
<div> </div> <p><b>Display Slide N-3</b></p>	<p>Point out that each of us is exposed daily to radiation from natural sources, including the sun and the Earth. Small traces of radiation are present in food and water. Radiation also is released from manmade sources, such as x-ray machines, television sets, and microwave ovens.</p> <p>Continue by explaining that nuclear power plants use the heat generated from nuclear fission in a contained environment to convert water to steam, which powers generators to produce electricity.</p> <p>Stress that <u>radiation has a cumulative effect</u>. The longer a person is exposed to radiation, the greater the risk of adverse effects. A high exposure to radiation can cause serious illness or death.</p> <p>Emphasize that the <u>potential danger from an accident at a nuclear power plant is exposure to radiation</u>. This exposure could come from the release of radioactive material from the plant into the environment, usually characterized by a plume (cloud-like) formation of radioactive gases and particles.</p> <p>Point out that the area affected by radioactive material release is determined by:</p> <ul style="list-style-type: none"> <li>▪ The amount of radiation released from the plant.</li> <li>▪ Wind direction and speed.</li> <li>▪ Weather conditions.</li> </ul>

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INSTRUCTOR GUIDANCE	CONTENT
<p><b>Major Hazards</b></p> <ul style="list-style-type: none"><li>• Major hazards to people in the vicinity of the plume<ul style="list-style-type: none"><li>▪ <u>Radiation exposure</u> to the body</li><li>▪ <u>Inhalation</u> of radioactive materials</li><li>▪ <u>Ingestion</u> of radioactive materials</li></ul></li></ul> <p>FEMA CERT Basic Training Unit 1: Nuclear Power N-4</p>	<p><b>Hazards</b></p> <p>Describe the major hazards to people in the vicinity of the radiation plume:</p> <ul style="list-style-type: none"><li>▪ <u>Radiation exposure</u> to the body from the cloud and particles deposited on the ground.</li><li>▪ <u>Inhalation</u> of radioactive materials.</li><li>▪ <u>Ingestion</u> of radioactive materials.</li></ul> <p>Emphasize that if an accident occurred involving a radioactive material release at a nuclear power plant, local authorities would:</p> <ul style="list-style-type: none"><li>▪ Activate warning sirens or another approved alert method.</li><li>▪ Provide instructions through the Emergency Alert System (EAS) on local television and radio stations.</li></ul>
<p><b>Emergency Planning Zones</b></p> <ul style="list-style-type: none"><li>• EPZ within a <u>10-mile radius</u> of the plant<ul style="list-style-type: none"><li>▪ Possible that people could be harmed by direct radiation exposure</li></ul></li><li>• EPZ within <u>50-mile radius</u> from the plant<ul style="list-style-type: none"><li>▪ Radioactive materials could contaminate water supplies, food crops, and livestock</li></ul></li></ul> <p>FEMA CERT Basic Training Unit 1: Nuclear Power N-5</p>	<p><b>Emergency Planning Zones</b></p> <p>Tell the group that local and State governments, Federal agencies, and the electric utilities have emergency response plans in the event of a nuclear power plant emergency. The plans define two Emergency Planning Zones (EPZs).</p> <p>Explain the EPZs to the participants:</p> <ul style="list-style-type: none"><li>▪ One EPZ covers an area within a <u>10-mile radius</u> of the plant where it is possible that <u>people could be harmed by direct radiation exposure</u>.</li><li>▪ The other EPZ covers a broader area, usually up to a <u>50-mile radius</u> from the plant, where <u>radioactive materials could contaminate water supplies, food crops, and livestock</u>.</li></ul>

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INSTRUCTOR GUIDANCE	CONTENT
 <p>Allow the participants time to respond.</p>  <p><b>Display Slide N-6</b></p> <p><a href="http://www.osha.gov/SLTC/etools/ics/images/respirator_01.jpg">http://www.osha.gov/SLTC/etools/ics/images/respirator_01.jpg</a></p>	<h3>Minimizing Radiation Exposure</h3> <p><b>What are the three ways to minimize radiation exposure?</b></p> <p>Use the slide to discuss the ways to minimize radiation exposure. Tell the participants that exposure can be minimized by:</p> <ul style="list-style-type: none"><li>▪ <u>Time</u>. Limit your time exposed to radioactive material. Most radioactivity loses its strength fairly quickly. In a nuclear power plant accident, local authorities will monitor any release of radiation and determine when the threat has passed.</li><li>▪ <u>Distance</u>. The more distance between you and the source of the radiation, the better. In a serious nuclear power plant accident, local authorities will call for an evacuation to increase the distance between you and the radiation. (Evacuation also reduces the period of time of exposure.)</li><li>▪ <u>Shielding</u>. The more heavy and dense material between you and the source of the radiation, the better. This is why local authorities could advise you to remain indoors if an accident occurs. In some cases, the walls in your home would be sufficient shielding to protect you.</li></ul>

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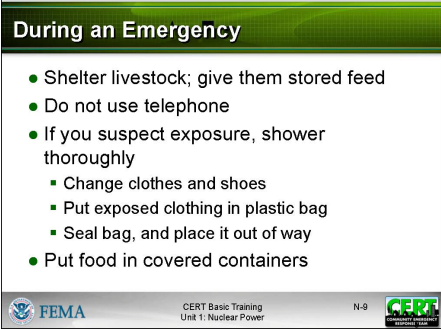

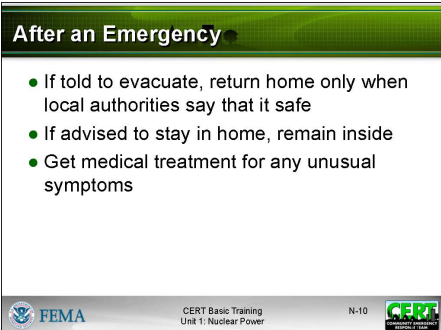
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INSTRUCTOR GUIDANCE	CONTENT
<div><p><b>Nuclear Emergency Terms</b></p><ul style="list-style-type: none"><li>• Notification of Unusual Event</li><li>• Alert</li><li>• Site Area Emergency</li><li>• General Emergency</li></ul><p><small>FEMA CERT Basic Training Unit 1: Nuclear Power N-7</small></p></div> <p><b>Display Slide N-7</b></p> <p>Discuss any sections of your local government’s EOP that may apply to nuclear power plant emergencies.</p> <div></div> <p>Allow the participants time to respond.</p>	<p><b>Nuclear Emergency Terms</b></p> <p>Emphasize the importance of knowing the terms that are used to describe nuclear emergencies:</p> <ul style="list-style-type: none"><li>▪ <b>Notification of Unusual Event:</b> A small problem has occurred at the plant. No radiation material release is expected. Federal, State, and county officials will be told right away. No action on your part will be necessary.</li><li>▪ <b>Alert:</b> A small problem has occurred, and small amounts of radiation material could leak inside the plant. This will not affect you, and you should not have to do anything.</li><li>▪ <b>Site Area Emergency:</b> A more serious problem has occurred, and small amounts of radiation material could leak from the plant. If necessary, State and county officials will act to assure public safety. Area sirens may be sounded. Listen to your radio or television for safety information.</li><li>▪ <b>General Emergency:</b> This is the most serious problem. Radiation material could leak outside the plant and off the plant site. The sirens will sound. Tune to your local radio or television station for emergency information reports. State and county officials will act to protect the public. Be prepared to follow instructions promptly.</li></ul> <p><b>During a Nuclear Power Plant Emergency</b></p> <p><b>What are measures that you can take if you hear a warning?</b></p>

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INSTRUCTOR GUIDANCE	CONTENT
<div><p><b>During an Emergency</b></p><ul style="list-style-type: none"><li>• Listen to warning</li><li>• Stay tuned to local radio or television</li><li>• Evacuate, if advised to do so</li><li>• If not advised to evacuate, shelter in place</li></ul><p>FEMA CERT Basic Training Unit 1, Nuclear Power N-8</p></div> <p><b>Display Slide N-8</b></p>	<p>Be sure to make the following points:</p> <ul style="list-style-type: none"><li>▪ <u>Listen to the warning.</u> Not all incidents result in the release of radiation. The incident could be contained inside the plant and pose no danger to the public.</li><li>▪ <u>Stay tuned to local radio or television.</u> Local authorities will provide specific information and instructions.<ul style="list-style-type: none"><li>• The advice given will depend on the nature of the emergency, how quickly it is evolving, and how much radiation, if any, is likely to be released.</li><li>• Local instructions should take precedence over any advice given on national broadcasts or in books.</li><li>• Review the public information materials that you received from the power company or government officials.</li></ul></li><li>▪ <u>Evacuate, if you are advised to do so.</u><ul style="list-style-type: none"><li>• Close and lock doors and windows.</li><li>• Keep car windows and vents closed. Use recirculated air.</li><li>• Listen to the radio for evacuation routes and other instructions.</li></ul></li><li>▪ If you are not advised to evacuate, <u>shelter in place.</u><ul style="list-style-type: none"><li>• Close doors and windows.</li><li>• Turn off the air-conditioner, ventilation fans, furnace, and other air intakes.</li><li>• Go to a basement or other underground area if possible.</li><li>• Keep a battery-powered radio with you at all times.</li></ul></li></ul>

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INSTRUCTOR GUIDANCE	CONTENT
<div>  <p><b>During an Emergency</b></p> <ul style="list-style-type: none"> <li>● Shelter livestock; give them stored feed</li> <li>● Do not use telephone</li> <li>● If you suspect exposure, shower thoroughly           <ul style="list-style-type: none"> <li>■ Change clothes and shoes</li> <li>■ Put exposed clothing in plastic bag</li> <li>■ Seal bag, and place it out of way</li> </ul> </li> <li>● Put food in covered containers</li> </ul> <p>FEMA CERT Basic Training Unit 1: Nuclear Power N-9</p> </div> <p><b>Display Slide N-9</b></p> <div>  </div> <p>Allow the participants time to respond.</p> <div>  <p><b>After an Emergency</b></p> <ul style="list-style-type: none"> <li>● If told to evacuate, return home only when local authorities say that it safe</li> <li>● If advised to stay in home, remain inside</li> <li>● Get medical treatment for any unusual symptoms</li> </ul> <p>FEMA CERT Basic Training Unit 1: Nuclear Power N-10</p> </div> <p><b>Display Slide N-10</b></p>	<p><b>During a Nuclear Power Plant Emergency (continued)</b></p> <p>Continue with the following points:</p> <ul style="list-style-type: none"> <li>■ <u>Shelter livestock and give them stored feed</u>, if time permits.</li> <li>■ <u>Do not use the telephone unless it is absolutely necessary.</u> Lines will be needed for emergency calls.</li> <li>■ <u>If you suspect exposure, shower thoroughly.</u> <ul style="list-style-type: none"> <li>● Change clothes and shoes.</li> <li>● Put exposed clothing in a plastic bag.</li> <li>● Seal the bag, and place it out of the way.</li> </ul> </li> <li>■ <u>Put food in covered containers or in the refrigerator.</u> Food not previously covered should be washed before being put in containers.</li> </ul> <p><b>After a Nuclear Power Plant Emergency</b></p> <p><b>What should you do <u>after</u> a nuclear power plant emergency?</b></p> <p>Summarize the discussion using the information from the slides that follow.</p> <p>Emphasize the following points:</p> <ul style="list-style-type: none"> <li>■ If told to evacuate, <u>return home only when local authorities say that it safe</u> to do so.</li> <li>■ <u>If advised to stay in the home</u>, remain inside until local authorities indicate that it is safe.</li> <li>■ <u>Get medical treatment</u> for any unusual symptoms, such as the rapid onset of vomiting that may be related to radiation exposure.</li> </ul>

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<b>INSTRUCTOR GUIDANCE</b>	<b>CONTENT</b>
	<p><b>Does anyone have additional questions, comments, or concerns about nuclear power plant emergencies?</b></p>