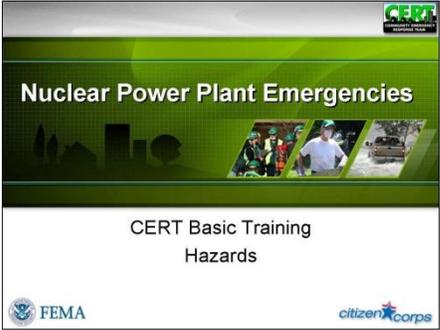
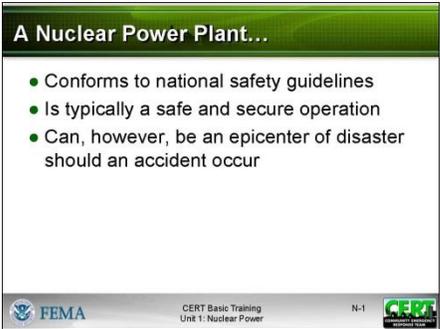
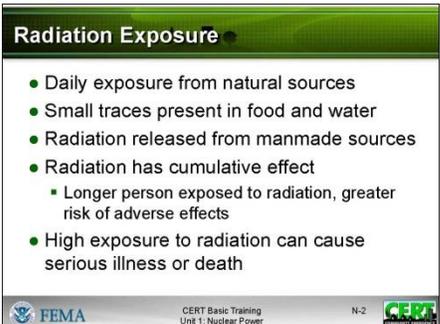
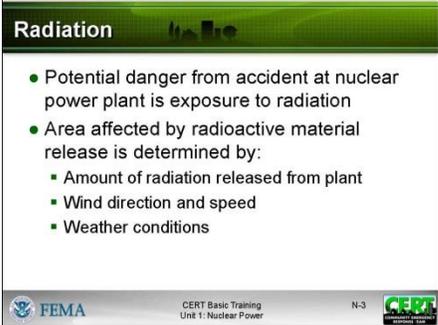


Nuclear Power Plant Emergencies

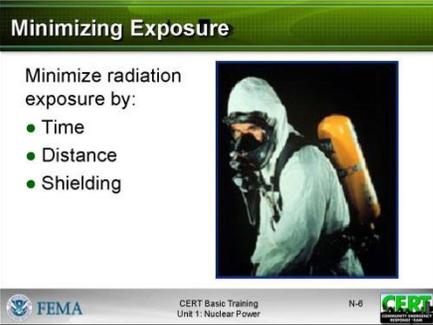
INSTRUCTOR GUIDANCE	CONTENT
 <p>The slide features a green header with the title "Nuclear Power Plant Emergencies" and a small CERT logo. Below the title is a collage of images showing people in safety gear and a nuclear power plant. The text "CERT Basic Training Hazards" is centered, with FEMA and citizen*corps logos at the bottom.</p>	<p>Introduction</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>Display Slide N-0</p>  <p>The slide has a green header with the title "A Nuclear Power Plant...". It contains a bulleted list: "Conforms to national safety guidelines", "Is typically a safe and secure operation", and "Can, however, be an epicenter of disaster should an accident occur". Logos for FEMA, CERT, and the slide number "N-1" are at the bottom.</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>Display Slide N-1</p>  <p>The slide has a green header with the title "Radiation Exposure". It contains a bulleted list: "Daily exposure from natural sources", "Small traces present in food and water", "Radiation released from manmade sources", "Radiation has cumulative effect" (with a sub-bullet: "Longer person exposed to radiation, greater risk of adverse effects"), and "High exposure to radiation can cause serious illness or death". Logos for FEMA, CERT, and the slide number "N-2" are at the bottom.</p>	<p>What is Radiation?</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>
<p>Display Slide N-2</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>

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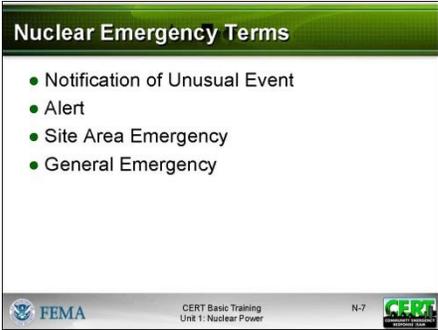
INSTRUCTOR GUIDANCE	CONTENT
 <p>Display Slide N-3</p>	<p>Continue by explaining that nuclear power plants use the heat generated from nuclear fission in a contained environment to convert water to steam, which powers generators to produce electricity.</p> <p>Stress that <u>radiation has a cumulative 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">▪ The amount of radiation released from the plant.▪ Wind direction and speed.▪ Weather conditions.

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INSTRUCTOR GUIDANCE	CONTENT
<p data-bbox="248 352 472 380">Major Hazards</p> <ul data-bbox="264 405 630 527" style="list-style-type: none">● Major hazards to people in the vicinity of the plume<ul data-bbox="285 453 553 527" style="list-style-type: none">▪ <u>Radiation exposure</u> to the body▪ <u>Inhalation</u> of radioactive materials▪ <u>Ingestion</u> of radioactive materials <p data-bbox="248 632 673 663">FEMA CERT Basic Training Unit 1: Nuclear Power N-4</p>	<p data-bbox="706 342 852 373"><i>Hazards</i></p> <p data-bbox="706 384 1463 453">Describe the major hazards to people in the vicinity of the radiation plume:</p> <ul data-bbox="706 474 1471 646" style="list-style-type: none">▪ <u>Radiation exposure</u> to the body from the cloud and particles deposited on the ground.▪ <u>Inhalation</u> of radioactive materials.▪ <u>Ingestion</u> of radioactive materials. <p data-bbox="706 667 1455 772">Emphasize that if an accident occurred involving a radioactive material release at a nuclear power plant, local authorities would:</p> <ul data-bbox="706 793 1484 951" style="list-style-type: none">▪ Activate warning sirens or another approved alert method.▪ Provide instructions through the Emergency Alert System (EAS) on local television and radio stations.
<p data-bbox="248 1024 537 1052">Emergency Planning Zones</p> <ul data-bbox="264 1073 630 1215" style="list-style-type: none">● EPZ within a <u>10-mile radius</u> of the plant<ul data-bbox="285 1100 610 1142" style="list-style-type: none">▪ Possible that people could be harmed by direct radiation exposure● EPZ within <u>50-mile radius</u> from the plant<ul data-bbox="285 1169 630 1215" style="list-style-type: none">▪ Radioactive materials could contaminate water supplies, food crops, and livestock <p data-bbox="248 1304 673 1335">FEMA CERT Basic Training Unit 1: Nuclear Power N-5</p>	<p data-bbox="706 1010 1195 1045"><i>Emergency Planning Zones</i></p> <p data-bbox="706 1052 1503 1230">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 data-bbox="706 1304 1219 1335">Explain the EPZs to the participants:</p> <ul data-bbox="706 1356 1503 1623" style="list-style-type: none">▪ 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>.▪ 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>.

INSTRUCTOR GUIDANCE	CONTENT
<p data-bbox="240 415 316 483"></p> <p data-bbox="240 520 646 588">Allow the participants time to respond.</p> <div data-bbox="240 630 673 955"><p>Minimizing Exposure</p><p>Minimize radiation exposure by:</p><ul style="list-style-type: none">• Time• Distance• Shielding<p>FEMA CERT Basic Training Unit 1: Nuclear Power N-6</p></div> <p data-bbox="240 987 673 1071">Display Slide N-6 http://www.osha.gov/SLTC/etools/ics/images/respирator_01.jpg</p>	<h2 data-bbox="706 325 1258 367"><i>Minimizing Radiation Exposure</i></h2> <p data-bbox="706 409 1396 472">What are the three ways to minimize radiation exposure?</p> <p data-bbox="706 630 1477 735">Use the slide to discuss the ways to minimize radiation exposure. Tell the participants that exposure can be minimized by:</p> <ul data-bbox="706 756 1510 1407" style="list-style-type: none">▪ <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.▪ <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.)▪ <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.

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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="237 369 675 699"></div> <p data-bbox="237 732 461 764">Display Slide N-7</p> <p data-bbox="237 804 643 947">Discuss any sections of your local government's EOP that may apply to nuclear power plant emergencies.</p>	<p data-bbox="706 338 1175 380"><i>Nuclear Emergency Terms</i></p> <p data-bbox="706 396 1503 468">Emphasize the importance of knowing the terms that are used to describe nuclear emergencies:</p> <ul data-bbox="706 485 1511 1335" style="list-style-type: none"><li data-bbox="706 485 1511 667">▪ <u>Notification of Unusual Event:</u> 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 data-bbox="706 684 1463 827">▪ <u>Alert:</u> 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 data-bbox="706 844 1487 1062">▪ <u>Site Area Emergency:</u> 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 data-bbox="706 1079 1487 1335">▪ <u>General Emergency:</u> 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.

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INSTRUCTOR GUIDANCE	CONTENT
<p data-bbox="235 325 316 409"></p> <p data-bbox="235 409 649 472">Allow the participants time to respond</p> <div data-bbox="235 546 673 882"><p data-bbox="243 556 487 598">During an Emergency</p><ul data-bbox="259 609 649 735" style="list-style-type: none">• Listen to warning• Stay tuned to local radio or television• Evacuate, if advised to do so• If not advised to evacuate, shelter in place<p data-bbox="235 840 673 882"> CERT Basic Training Unit 1: Nuclear Power N-8 </p></div> <p data-bbox="235 913 462 955">Display Slide N-8</p>	<p data-bbox="706 325 1445 367"><i>During a Nuclear Power Plant Emergency</i></p> <p data-bbox="706 399 1469 472">What are measures that you can take if you hear a warning?</p> <p data-bbox="706 546 1226 588">Be sure to make the following points:</p> <ul data-bbox="706 598 1510 1858" style="list-style-type: none">▪ <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.▪ <u>Stay tuned to local radio or television.</u> Local authorities will provide specific information and instructions.<ul data-bbox="755 850 1502 1186" style="list-style-type: none">• 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.• Local instructions should take precedence over any advice given on national broadcasts or in books.• Review the public information materials that you received from the power company or government officials.▪ <u>Evacuate, if you are advised to do so.</u><ul data-bbox="755 1270 1510 1480" style="list-style-type: none">• Close and lock doors and windows.• Keep car windows and vents closed. Use recirculated air.• Listen to the radio for evacuation routes and other instructions.▪ If you are not advised to evacuate, <u>shelter in place.</u><ul data-bbox="755 1554 1469 1858" style="list-style-type: none">• Close doors and windows.• Turn off the air-conditioner, ventilation fans, furnace, and other air intakes.• Go to a basement or other underground area if possible.• Keep a battery-powered radio with you at all times.

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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="240 338 673 667"> <p>During an Emergency</p> <ul style="list-style-type: none"> ● Shelter livestock; give them stored feed ● Do not use telephone ● If you suspect exposure, shower thoroughly <ul style="list-style-type: none"> ■ Change clothes and shoes ■ Put exposed clothing in plastic bag ■ Seal bag, and place it out of way ● Put food in covered containers <p>FEMA CERT Basic Training Unit 1: Nuclear Power N-9</p> </div> <p>Display Slide N-9</p> <div data-bbox="240 1024 316 1102"> </div> <p>Allow the participants time to respond.</p> <div data-bbox="240 1354 673 1684"> <p>After an Emergency</p> <ul style="list-style-type: none"> ● If told to evacuate, return home only when local authorities say that it safe ● If advised to stay in home, remain inside ● Get medical treatment for any unusual symptoms <p>FEMA CERT Basic Training Unit 1: Nuclear Power N-10</p> </div> <p>Display Slide N-10</p>	<p>Continue with the following points:</p> <ul style="list-style-type: none"> ■ <u>Shelter livestock and give them stored feed</u>, if time permits. ■ <u>Do not use the telephone unless it is absolutely necessary.</u> Lines will be needed for emergency calls. ■ <u>If you suspect exposure, shower thoroughly.</u> <ul style="list-style-type: none"> ● Change clothes and shoes. ● Put exposed clothing in a plastic bag. ● Seal the bag, and place it out of the way. ■ <u>Put food in covered containers or in the refrigerator.</u> Food not previously covered should be washed before being put in containers. <p><i>After a Nuclear Power Plant Emergency</i></p> <p>What should you do <u>after</u> a nuclear power plant emergency?</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"> ■ If told to evacuate, <u>return home only when local authorities say that it safe</u> to do so. ■ <u>If advised to stay in the home</u>, remain inside until local authorities indicate that it is safe. ■ <u>Get medical treatment</u> for any unusual symptoms, such as the rapid onset of vomiting that may be related to radiation exposure.

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