PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION

OFFSITE TRAINING PROGRAM

BUS DRIVER TRAINING

Instructor Note

I. INTRODUCTION

A. Limerick Generating Station

Philadelphia Electric Company is constructing ~~Lime~~rick Generating Station in Limerick, PA. Because Limerick is a nuclear power station, training is being conducted in Montgomery, Chester, and Berks counties to teach emergency workers what actions they must take should an accident ever occur at the plant. The purpose of the training is to teach emergency response personnel how to protect the residents of their communities.

Slide - Limerick Site 35R

B. The Bus Driver's Role in Emergency Response

In addition to firefighters, police, and numerous other emergency volunteers, school bus drivers play an important role in the emergency response plan. If an evacuation of school children from the area were ever necessary, school buses would be the primary means of transporting the children to a safe area.

Slide 52T

C. Susceptability of Children to Radiation

You may wondered why so much attention is given to the protection of school children. School children are especially sensitive to the effects of radiation. This is due to the fact that the

Slide - Kids at playground

human cells most sensitive to radiation are those that are either very primitive or those that are rapidly growing. Because of this increased sensitivity, County officials have developed plans to ensure that school children will be given the highest priority should an evacuation be considered due to an accident at the plant.

D. Objectives of Training

In this training program we will discuss some concepts of radiation, emergency plans, and the response actions that you, as bus drivers, would have should an emergency ever occur at the Limerick Generating Station. More specifically, we will cover:

Slide - Topics for Discussion 37F

1. Three types of radiation and the characteristics of each one, including sources of radiation and how it is measured.

2. The four incident classifications and the bus driver's responsibilities for each classification.

3. The protective actions that can be taken by the general public and emergency workers.

4. The correct use of dosimeters and how to fill-out the dosimeter report forms.

II. NUCLEAR POWER

A. Power Plant Operation

The nuclear-electric power plant produces commerical electric power using the conventional heat-to-steam

*Slide - Heat-to-Steam process

method. The energy source, however, is the nuclear fuel contained in the nuclear reactor. The reactor, serving as the furnance, provides the heat through the nuclear fission process, which is the splitting of atoms.

320
*Slide - Fission process
32C

The initial reactor core weighs about 100 tons. The fuel contained in the core is slightly enriched uranium dioxide which is in the form of small cylindrical pellets. These pellets are placed in thin metal tubes to form fuel rods. A number of fuel rods bundled together make up the fuel assembly, a number of fuel assemblies make up the reactor core. The core is contained in a massive 6 1/2 inch thick steel cylinder, known as the reactor vessel, through which cooling water flows.

Slide - pellets
32E
Slide - fuel rods
32F
Slide - fuel assembly 32G
Note: Stress differences between reactor and bomb.

The two most common types of commercial reactors used in the United States are the pressurized water reactor and the boiling water reactor.

The basic difference is the primary coolant system.

1. The Limerick Generating Station is a boiling water reactor. The boiling water reactor primary cooling system does not employ a heat exchanger. Instead, the water is permitted to boil in the reactor vessel. The steam generated in the reactor vessel is fed directly to the turbine-generator which converts the thermal energy of the steam to ultimately electrical energy.

Slide - BWR 32P

2. In both types of reactors, the cooling water that flows through the cooling towers is isolated from the primary system water; therefore, it contains no radioactivity other than the natural radioactivity present in all water.

Slide - cooling towers 35S

B. Reactor Safety Features

1. Equipment and instrumentation continuously monitor and indicate plant conditions. The information from the equipment and instruments is provided to the control room operators through visual and audible means and to the reactor's computer system electronically.

Slide - Control Room Simulator 35C

The computer system is designed to automatically activate reactor safety systems at the first sign of an unsafe condition. Additionally, control room operators can manually manipulate safety systems in the event of computer failure.

If the plant has a problem, the first priority is to shut down the nuclear reaction. Basically, this is accomplished by the raising of control rods into the core. The control rods absorb neutrons. Neutrons cause fission to occur. By absorbing all of the neutrons, the reaction is stopped. Control rods can be inserted into the core automatically by the reactor computer system or manually by the operators.

Slide - Control rods 32U

Once the reaction is stopped, it is still necessary to keep the reactor core cool. Heat is still being generated by the highly radioactive

fission products in the fuel. In addition to the primary means of heat removal (the turbine), there are backup systems provided to remove heat from the core and provide cooling water in the event the primary system fails.

2. All reactor safety systems which provide protection for the public have backups. An example of this design philosophy is the multibarrier concept used to contain the radioactive fuel. The fuel is contained in the fuel rods; the fuel rods are contained in the steel pressure vessel; the vessel is surrounded by the steel and concrete primary containment; which is contained within a secondary containment. For the radioactive fuel to reach the public all the barriers; the rod, the vessel and both containments must be breached.

Slide - Multibarrier Concept 32R

Slide - Limerick Containment Building 35B

C. Previous Nuclear Reactor Safety Problems

1. The "defense in depth" philosophy is one reason the nuclear industry (when compared to other commercial industries), has a relatively safe history. However, safety systems can fail and accidents happen. This is why emergency planning is necessary.

2. The incident at Three Mile Island received a great amount of media coverage. The Three Mile Island Unit 2, through a series of mechanical failures and human misjudgments, experienced damage that resulted in a minor release of radiation that amounted to less radiation than

Slide - TMI Media Coverage 32M

that of a person smoking two packs of cigarettes in a lifetime.

The accident began when a blockage occurred in a transfer line to a resin regeneration tank. This blockage caused a loss of condesate flow that lead to a trip of the main feedwater pump. At that point the turbine also tripped. Automatically, the emergency feedwater pump started; however, since the line was blocked, it could not deliver the water to the steam generators.

Slide - PWR schematic (Presentation of this material depends upon the make-up of the audience. Explain or point out on schematic all equipment mentioned in narrative.)

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The loss of feedwater to the steam generators caused the primary coolant water to become hotter, and therefore, increased the pressure to such a degree that the pressurizer relief valve opened. High reactor coolant pressure caused the control rods to trip. The control room operators then realized that the emergency feedwater block valves were closed and opened the valves thus restoring the flow of coolant water to the steam generators.

The insertion of the control rods slowed down the rate of fission and reduced the pressure. At this point, the pressurizer relief valve should have closed but it remained open. As the coolant continued to discharge through the pressurizer relief valve, the primary coolant pressure decreased. In addition, the coolant was being discharged into and filled the drain tank in the bottom of the containment building. A rupture disk burst in the drain tank and the primary coolant flowed to the containment building sump.

Another error occurred when the operators cut back the high-pressure injection system that had begun pumping borated water. The operators were unaware that a loss of coolant accident was in progress and considered the use of the emergency core cooling system to be inappropriate.

The two reactor coolant pumps were turned off due to severe vibrations that occurred because the pumps were then handling steam instead of pressurized water. A bubble formed in the core leaving uncovered fuel. While a portion of the core was uncovered, the zirconium cladding became very hot and melted. Simutaneously, conditions produced a large amount of hydrogen.

The operators finally isolated the open relief valve and began efforts to provide coolant to the core.

Primary coolant was inadvertently pumped from the containment sump to auxiliary building lower levels--severely contaminating the auxiliary building and allowing releases to atmosphere via auxiliary building ventilation.

If anyone is interested in discussing in more detail how and why the accident occurred, we will be glad to do so at the end of the training session.

3. Prior to this accident, many people were convinced that accidents such as this could not happen. However, since the accident at Three Mile Island, public officials, and the

nuclear industry as well, have realized the heightened need for protecting communities located near reactors.

4. During the last four years, many steps have been taken to better protect the safety of the nuclear reactors and community residents.

Slide - Industry Safety Improvements 32S

   a. Development of emergency plans regarding the utility's and communities' responses to an accident.

   b. Training programs for utility employees and community emergency response organizations.

   c. Redundant safety systems on the reactor.

   d. Development of communications systems to notify public officials and alert the general public of any possible accidents.

III. INTRODUCTION TO RADIATION

"Radiation" refers to any type of energy that radiates from its source.

Slide - types of radiation 10.10

Light is a form of electromagnetic radiation.
Sunburn comes from ultraviolet radiation.
X-rays are a form of radiation.
Radiowaves and microwaves are also forms of radiation.

Instructor Note

A. Background Radiation

Radiation is usually associated with nuclear power plants and nuclear weapons. However, radiation is not a foreign substance, but in fact, radiation always surrounds us. This is called "background radiation."

1. Natural background radiation is radiation emitting from natural occurring radioactive materials normally present in the environment. These include sources such as solar and cosmic radiation and radioactive elements from the earth's crust, the ground, building materials and the human body.

Slide - Natural Background 10I
Cigarettes: Radon, Thorium, Uranium, etc.
Human Body: Potassium
Fiesta Ware Plates: Thorium, Uranium,
Lantern Mantles: Thorium

2. Average for people in Pennsylvania is 100 mr/year.

3. In addition, we are exposed to man-made radiation every time we have an X-ray, watch television or travel by jet, and from bomb fall-out, luminous dial watches, etc.

Slide - Man-made radiation 10J
Pass around Fiesta Ware plates and Coleman lantern mantles. Briefly discuss survey meter and pass around.

B. Ionizing Radiation

In emergency planning, we are concerned with three types of radiation that are generated.

1. Alpha

2. Beta

3. Gamma

These radiations are capable of chemically altering material that they interact with, such as human cells.

Materials that emit these kinds of radiation are said to be "radioactive."

Slide - Radio-active 10D

1. Alpha radiation consists of particles and is the largest form of ionizing radiation, but even alpha particles are not visible to the naked eye. Because of its large size, alphas do not travel far (only inches in air), and can be completely stopped by a sheet of paper. Alphas can not penetrate the skin, however, they can cause severe damage to a person if taken into the body through breathing or swallowing with food or water.

Slide - Alpha 10Q

2. Beta radiation consists of particles which are much smaller than alpha particles. They can travel farther than alpha and could penetrate a sheet of paper but a few layers of cloth will stop Beta. Very high beta does cause damage to the skin similar to a burn. Beta radiation is also a concern if taken into the body through breathing or swallowing.

Slide - Beta 10R

Instructor Note

3. Gamma radiation is very similar to X-rays except that gammas come from a different part of the atom. Just like X-rays, gammas can penetrate the human body. Gamma radiation is capable of damaging internal organs.

Slide - Gamma 10S
Slide - Radiation
penetrations
travels 3-4 cm
travels 12ft/MeV
travels 2-8 Rm
10.1B

C. Measuring Radiation

Just as there are terms used for measuring distance (inches, miles, meters) or weight (ounces, pounds, grams) we have terms for measuring radiation.

1. Roentgen - amount of gamma radiation in air.

Slide - Roentgen
10N

2. Rem - amount of radiation absorbed by human tissue; the rem is simply a way of expressing radiation in terms of its impact on man. For our purposes, Roentgens and Rems are equal: 1 Roentgen = 1 Rem.

Slide - Rem
10M

Slide - 1 Roentgen = 1 Rem 10K

3. One last term we will be using is the prefix milli, usually in the terms milliroentgens or millirems. Milli is a prefix used in the metric system. One thousand milli equal one. Therefore, 1,000 milliroentgen equal one roentgen. 1,000 millirem equal 1 rem. Measurements given in milliroentgens or millirems usually involve low levels of radiation which could be released during an incident at a nuclear power plant.

Slide - Milli
10L

Instructor Note

D. Radiation Terms

There are several terms associated with radiation that you may encounter.

1. Contamination is radioactive material where it is not wanted. Contamination can be washed off. (Exposure continues until contamination is removed.)

Slide - Rad. material vs. Radiation 10.1C

2. Exposure occurs when an object or person is subjected to radiation. Exposure does not contaminate. Exposure stops when you leave the vacinity of the source.

3. Dose is the amount of radiation that is absorbed by your body. Dose is not necessarily as high as exposure. The effects of dose received by a person depend upon how much was received over what period of time in what manner.

Slide - Watch/ Calendar (whiskey example) 10.1E

IV. DOSIMETERS

Slide - Comparison of radiation levels 10.1A

A. A dosimeter is a devise that measures exposure to radiation. Dosimeters will only be issued to those bus drivers who are entering an area that is being evacuated. The issue of dosimetry does not mean that a release has occurred or will occur. They may be issued as a precaution only.

Slide 11H

Dosimetry would be issued at a location called a transportation staging area. Those people being

issued dosimetry would receive through dosimetry which they should wear on their outer clothing while inside the evacuating area.

All buses will enter risk area through transportation staging areas. Drivers will pick up dosimeters at staging areas.

B. Thermoluminescent dosimeter (TLD)

Slide - Pro's and Con's of TLD's 11M

1. School bus drivers should clip the TLD to their outside clothing somewhere between the neck and the waist. The window on the TLD should face outward.

Demonstrate use of TLD and pass TLD around for examination.

2. TLD's are more accurate than self-reading dosimeters; however, the readings can only be obtained through the use of special equipment. TLD's measure dose of gamma and/or beta.

3. Each school bus driver should retain his/her individual TLD until the end of the emergency when the TLD's should be turned in to the supervisor.

C. Self-reading dosimeters

Slide - Pro's and Con's of self-reading dosimeter 11K or N

1. Self-reading dosimeters enable school bus drivers to continually keep track of individual radiological exposure. However, self-reading dosimeters are not as accurate as TLD's and only record gamma radiation.

Distribute training dosimeters and chargers.

Instructor Note

2. Each driver will be given two self-reading dosimeters to wear while inside the risk area, one will serve as a back-up for the other.

   - CD V-730 measures 0-20 R
   - CD V-742 measures 0-200 R

R = Roentgen

3. Since self-reading dosimeters do not have their own batteries, they must be charged or zeroed before they can be used. CD V-750 dosimeter chargers will be made available to school bus drivers to charge their dosimeters at the transportation staging area. Dosimeters will be zeroed by the County Radiological Officer when they are distributed. They may need to be rezeroed before they are used, and after each mission.

4. Charging a dosimeter

   a. Install a flashlight battery in the CD V-750 dosimeter charger.

   b. Place dosimeter charger on a flat surface such as a table.

   c. Unscrew the cap of the charging receptacle.

   d. While pressing down on the dosimeter check to make sure that the vertical hairline is on zero.

Slide - how to charge the dosimeter 11G

Demonstrate how to charge a dosimeter

1. Press lightly on poor lighting situations
2. Press firmly to zero

e. If it does not read zero, turn the control knob to the left or the right until it does read zero.

f. After taking the dosimeter off the charger, read it again by holding it up to a source of light. If the hairline has slipped, rezero the dosimeter.

D. Dosimeter/KI Report Form

1. Fill in your name, address, county that you are working in, and social security number. Your emergency organization is the school district by whom you are employed.

This should be a multiple copy form; picked up with dosimeters.
Slide - Report Form (series of 5)

2. For each mission, fill in your destination, date the serial number and initial reading of each dosimeter. While in the risk area, read the dosimeters each half hour. Do not exceed 25 R cumulative total. If the readings from the two dosimeters do not match, use the higher reading.

Slides - 53O
53Q
53S
53P
53N
53R

3. Upon completion of mission, report to transportation staging area to receive next assignment. If no further runs are to be made, you may be requested to report to a decontamination station to be monitored for contamination, and to return dosimeters and Dosimetry/Report Form.

Individual school districts may arrange shuttle from host schools to cars in EPZ. Encourage drivers to make arrangements with family or friends to have car and

belongings brought outside the risk area.

V. EMERGENCY PLANNING

Compared to other industries, the nuclear industry has experienced a relatively safe history. However, the accident at Three Mile Island proved that even with all the back-up systems, equipment can fail. Shortly after the TMI accident, the federal government prepared planning guidance for state and county emergency management agencies. This guidance set forth criteria that radiological response plans must meet in order to be approved by the federal government.

A. Emergency Planning Zones (EPZ's)

The federal government determined that there are two different zones around a nuclear power plant for which plans must be written to protect the residents of those areas.

Slide - EPZ's 14H

1. Plume Exposure Pathway EPZ

A ten-mile radius around a nuclear power plant where the hazards from a release would be from:

Slide - Limerick PEP EPZ 54A

a. Exposure from a passing plume composed of radioactive materials and gases, or

b. Breathing air containing radioactive particles or gases from a passing plume.

2. Ingestion Exposure Pathway EPZ

A fifty-mile radius surrounding a nuclear pla site where the main source of exposure would from eating or drinking contaminated foods or water. Health officials would perform sampl in this area to ensure that no contaminated meats, crops or milk would be present.

B. Public Alert/Notification System

1. If an accident were to occur at the LGS, emergency public information activities would be initiated to inform the public of the nature and severity of the accident. Emergency public information will be coor- dinated through news releases by the Stat In addition to facility and key response organization spokespersons.

2. The Nuclear Regulatory Commission requir a warning system be installed around eve operating nuclear power plant. The sys provide the capability for alerting and ing information to residents of the pl exposure pathway EPZ.

3. The public alert/notification system r sirens primarily for the alert and th Broadcast System for notification of public. Monitors, mobile loudspeaker other special provisions for alertin the sirens for public alert.

Instructor Note

4. The siren is designed to alert the population at risk to tune to their Emergency Broadcast System (EBS) for important emergency information. The sounding of sirens does not mean that the public should take shelter or evacuate. The sirens only indicate that people should turn to the EBS for information or instructions.

200 sirens will be installed by PECo They will be placed on top of 50-foot utility poles. The sirens will rotate and can each be heard for a distance of about 4,000 feet. Installation will begin about Feb. 1, 1983, and should be completed by July 1, 1984.

5. Specifically, this system has been designated for the capability to provide both an alert signal and an informational or instructional message to the population throughout the plume exposure pathway EPZ, within 15 minutes.

6. Philadelphia Electric Company, following discussions with County and State officials, will purchase sirens to be installed as the alert portion of the public alert/notification system.

Cost of the system will be about $4 million.

7. The siren system would be activated from County Offices. The siren system would produce a 3-5 minute steady tone and would be sounded to advise persons living, working or traveling in risk portions of the County to tune to the EBS stations for further information.

8. Should any of the sirens fail to sound, the system would indicate County officials. Route alert teams would then be dispatched to provide public alert through the use of public address systems or bullhorns.

9. County officials would activate the public alert/notification system.

10. After the activation of the alert/notification system, the County, in coordination with the State, would provide continuing emergency public information through a County Public Information Officer to be located at the County's Media Center.

11. If conditions change, the public alert/notification system would again be activated for the purpose of disseminating such recommendations to the public.

12. During the next several months, both Philadelphia Electric Company and County officials will be conducting a public education program. The public alert/notification system concept will be extensively discussed throughout the public education program.

VI. PROTECTIVE ACTIONS

Those actions taken to avoid or reduce projected exposures to radiation. The selection of a particular protective action by State and county officials depends upon the conditions of the emergency. Protective actions are based on Mass, Distance, Time concepts.

Slide - Protective Action 15.10

Slide - Mass, Distance, Time 15A

A. For the general public

1. Sheltering

Slide - "Sheltering" 15C

Instructor Note

a. When this action is recommended, the public will be advised to seek shelter in a permaanent, reasonably airtight structure, such as a house, commercial building or office building. The public will be instructed to close doors and windows and to reduce outside air intake from heating or cooling systems.

Slide - Closing window (buildings) 15.1F

b. Persons traveling by motor vehicle in the risk area will be advised to close windows and vents and to turn off heating or cooling systems.

Slide - Person in car 15.1G

2. Selective Evacuation

Slide - Selective Evacuation 15.1A

a. When selective evacuation is recommended, specific populations may be evacuated due to increased susceptibility.

b. Such populations may include pregnant women, pre-school children or the chronically ill.

Slide - High Risk Individual 15.1E

3. Evacuation

Slide - "General Evacuation" 15.1B

a. When an evacuation is recommended, all members of the pubic will be advised to leave the risk area until it has been determined that all danger has passed.

Slide - Traffic 15M

b. The Governor has the right to compel an evacuation of any risk area should such an evacuation become necessary.

Instructor Note

c. Evacuation concepts

Slide - Evacuation concepts 560

(1) Spontaneous Evacuation

The evacuation of members of the general public on their own and prior to the recommendation or order of public officials.

Although an evacuation of the general public surrounding Three Mile Island was never recommended by public officials, certain studies estimated that 48-52% of the general public evacuated without being instructed to do so by officials. Spontaneous evacuation may substantially reduce the amount of people who would later need to be evacuated.

(2) Main Evacuation Routes

Those roadways identified in advance as the principal routes to evacuate people from the risk area. Specific evacuation routes would be announced at the time. Local conditions would determine actual evacuation routes to be used. Bus drivers will use these routes to get out of risk area and then will proceed to host school or reception center. (Indicate routes appropriate to area.)

Slide - EPZ w/ Main Evacuation Routes 548

(3) Pick-Up Points

Those predesignated locations at which members of the general public without automobiles or other means of transportation will be provided with transportation out of the risk area. If assigned pick-up point run, driver will receive a map from transportation staging area to Municipal EOC. Someone familiar with area will board bus and direct around area to pick up residents.

(4) Traffic Control Points

Those locations on main evacuation routes that would be staffed by local police or the State Police in order to provide ease of access and continued movement of traffic.

Slide - Traffic Control/Access Control Points 54C

(5) Access Control Points

Those predesignated locations staffed by local police, the State Police, or by the National Guard in order to prevent entry into the risk area during an accident. These points will be located on or immediately beyond the boundary of the risk area. Check points will stop all people from entering an area, except residents.

(6) Host Schools for Students

Those places where school students and staff will be evacuated to and later reunited with their families.

Slide - Host Schools/Mass Care/Reception Centers 56S

(7) Reception Centers

Those predesignated sites outside the risk area at which evacuees will be directed to shelters if they need a place to stay. Pick-up runs will go through reception centers to mass care.

Slide - Map 54D

(8) Mass Care Centers

Those facilities established outside the risk area at the time of an accident for the purpose of providing food, lodging and medical care on a short-term basis for persons evacuating the risk area. Evacuees and their vehicles will be monitored and decontaminated if necessary.

(9) Central Resource Receiving Points

A location outside the risk area suitable for receiving and distributing supplies and equipment.

Slide - 56R
Slide - 54F

(10) Transportation Staging Area

A designated location from which transportation resources are coordinated

and/or dispatched. These are located on each of 5 major access roads into the area:

Rt. 422, Rt. 100 (Berks)
Rt. 100 (Chester)
Rt. 63, Rt. 309, Rt. 363/202 (Montgomery)

This is the point where bus drivers will report to receive detailed information and re-assignments.

(11) Decontamination Station

A facility located just outside the risk area where emergency workers undergo any necessary decontamination monitoring or decontamination.

B. Specifically for emergency workers

1. Radioprotective Drugs

Slide - "Radioprotective drugs" 15F

Should a release from a nuclear power plant be expected, officials would be concerned about the possibility of a radioactive form of iodine being in the release.

a. Iodine, such as in iodized salt, tends to locate in the thyroid gland. Radioprotective drugs are substances which tend to fill up the thyroid with safe iodine thus reducing the amount of radioactive iodine that could be taken up by the thyroid gland.

Instructor Note

Potasium iodide (chemical symbol KI) is a substance that may be used for this purpose. The potassium iodide would be given in tablet form.

b. Radioprotective drugs may or may not be recommended for emergency workers, such as school bus drivers.

2. Limitation to Duration of Exposures

Slide - Limitation to duration of exposure

15G

The best way to prevent high dose is to limit the time that you are exposed to radiation. Limitation to duration of exposure involves actions such as rotating shifts and carefully watching radiation levels. Check dosimeters every half hour. The dosimeter report forms will be used to limit your exposure to radiation.

3. Respiratory Protection

Slide - 15D

a. Respiratory protection is an action which is used by itself or in conjunction with other protective actions.

Down play for the general public

b. When respiratory protection is recommended, emergency workers within the risk area will be advised to cover their noses and mouths with handkerchieves, cloth, or protective devices, and to limit air intake from heating or cooling systems if they are in an enclosed area.

40M

Instructor Note

4. Double Clothing

Slide - Double Clothing 15.1C

a. Double clothing is a protective action which can be used by itself or in conjunction with other protective actions.

b. When recommended, workers will be advised to use personnel clothing, (rain gear, turnout gear, boots or galoshes with pant legs tucked in, winter coats with collars turned up, gloves, etc.) to provide protection by minimizing skin and street clothing/ uniform contamination.

Slide - 40N

VII. INCIDENT CLASSIFICATION

Any incident that occurs at a nuclear power plant can be categorized into one of four emergency classifications:

A. UNUSUAL EVENT
B. ALERT
C. SITE EMERGENCY
D. GENERAL EMERGENCY

Slide - Incident Classifications 2K

The Unusual Event and Alert stages provide early and prompt notification of minor events which could lead to more serious consequences given operator error or equipment failure. The levels of classifications provide time for emergency organizations to notify members, assemble equipment, and prepare to activate. By the time a more serious classification is reached, the emergency organizations are prepared to give a full response.

Instructor Note

A. Unusual Event

Slide - Unusual Event 2C

1. A minor change has occurred in the normal plant operating procedures. No release of radioactive material is expected.

Examples:

- Fire within plant lasting more than 10 minutes.
- Security threat or attempted entry.
- Abnormal coolant temperature or pressure or fuel temperature outside of technical specification limits.

2. Usually on such a scale that the on-site emergency organization can handle the situation (possibly with assistance from local fire or police department).

B. Alert

Class Description

Slide - Alert 2E

1. An abnormal plant condition exists and very small amounts of radiation may be released.

Examples:

- Primary coolant leak rate greater than 50 gpm.
- Fuel damage accident with release of radioactivity to containment or fuel handling building.

Instructor Note

- Severe natural phenomena (flood or hurricane winds near design levels)

C. Site Emergency

Class Description

1. Plant functions needed to protect the public may fail. Releases of radioactive material are expected to be in very small amounts.

Slide - Site Emergency 2G

Examples:

- LOCA greater than makeup pump capacity.
- Loss of offsite power and onsite AC power for more than 15 minutes.
- Effluent monitors detect levels corresponding to greater than 50 mR/hr for 1/2 hour or greater than 500 mR/hr Whole Body for 2 minutes at the site boundary for adverse meteorology.

D. General Emergency

Class Description

Slide - General Emergency 2I

Instructor Note

- Severe natural phenomena (flood or hurricane winds near design levels)

C. Site Emergency

Class Description

1. Plant functions needed to protect the public may fail. Releases of radioactive material are expected to be in very small amounts.

Slide - Site Emergency 2G

Examples:

- LOCA greater than makeup pump capacity.
- Loss of offsite power and onsite AC power for more than 15 minutes.
- Effluent monitors detect levels corresponding to greater than 50 mR/hr for 1/2 hour or greater than 500 mR/hr Whole Body for 2 minutes at the site boundary for adverse meteorology.

D. General Emergency

Class Description

Slide - General Emergency 2I

Instructor Note

1. A threat to the general public either currently exists, or is likely to occur in the near future.

Examples:

- Effluent monitors detect levels corresponding to 1 rem/hr Whole Body or 5 rem/hr Thyroid at the site boundary under actual meteorological conditions.
- Loss of 2 of 3 fission product barriers with a potential loss of 3rd (loss of primary coolant boundary clad failure and potential loss of containment).
- Loss of physical control of plant facility.

VIII. RESPONSE

A. Unusual Event Response

Slide - 52N

1. State and local authorities are notified.

2. No action is required by bus drivers at this classification.

Instructor Note

B. Alert Response

1. State and local authorities are notified and key emergency management staff would report to and activate their Emergency Operations Center.

Slide - Alert response 520

2. Bus drivers are notified and requested to be at a place where they can be reached by phone.

3. Assignments and maps are reviewed.

4. Transportation equipment is inventoried; unserviceable vehicles are reported to Superintendent.

5. Vehicles are fueled and given priority maintenance.

C. Site Emergency Response

Slide - Site response 52P

1. All county and local Emergency Operations Centers are fully activated. All support organizations and facilities are placed on standby.

2. School bus drivers are officially placed on standby.

3. Priority repair for out-of-service vehicles.

4. School buses are prepared for possible evacuation.

5. Carry out actions for General Emergency if sheltering or evacuation is recommended.

D. General Emergency Response — Slide - 52Q

1. Position school buses at assigned schools.

2. Confirm positioning of buses at assigned locations. Any unmet needs are reported to the Superintendent.

3. If sheltering is recommended: — Slide - 52R

   a. All drivers should close vehicle doors and windows.

   b. All drivers will close ventilation systems on their vehicles.

   c. Proceed to a designated location outside of the EPZ if you currently are performing your normal work schedule and have students on board.

   d. Notify the Transportation Officer of your status after completion of assignment.

4. If evacuation is recommended: — Slide - 52S

   a. Drivers will assist assigned teachers in loading students.

b. Drivers will proceed to pre-designated host schools where students can be picked up by their parents.

c. Drivers will report to the transportation staging area, upon completion of each run, to determine if re-assignments are necessary. If the driver is to be re-assigned, they will receive dosimeters and dosimeter report forms before reentering the risk area.

d. Bus drivers will make as many runs as necessary to complete the evacuation of the risk area.

e. Additional drivers and buses will be assigned to each host school to move students to mass care centers if required.

5. If school is not in session:

a. The county will contact the contractor or school district superintendent, who will notify the drivers.

b. Drivers will receive assignment (for pick-up run) either with their notification or at bus garage.

IX. REVIEW AND QUESTIONS