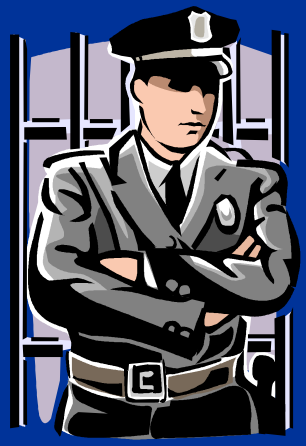
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

HRTD
Human Resources
Training & Development

Physical Protection and Emergencies

Chapter 10

Objectives:



Describe the purpose of physical protection.

Describe the levels of access control.

Describe the general requirements for entry and expected conduct in protected/vital and material access areas.

Describe safeguards information and classified information and how it is to be handled.

Describe the general actions taken for various emergencies, accidents, and drills.

List situations that require evacuation of the work area.

Physical Protection

The purpose of physical protection is to :

1) Protect against acts of radiological sabotage,
2) Prevent theft of special nuclear material (SNM - Pu, U-233 and U-235),
3) Protect safeguards and classified information against unauthorized release. Safeguards information is available on a “need-to-know” basis only.

Security Clearance

Access to classified information requires two things:
A security clearance equal to or above the level of classification, and
A "need-to-know."

At NRC, security clearance levels are indicated by the security badge worn by NRC employees, contractors, and consultants.

The designations for access authorization in use at the NRC are:

- **"No Access" Authorization**
- **"L" Level Clearance**
- **"Q" Level Clearance**

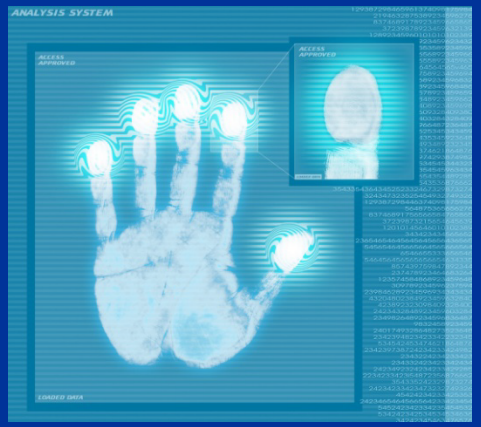
Access Control

The levels of access control at commercial reactors are known as:

1) **Owner controlled area,**

2) **Protected area - area inside the fence; and**

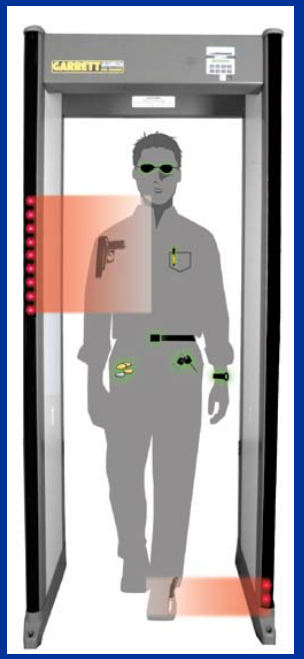
3) **Vital Area - area with equipment whose failure could endanger the public by exposure to radiation.**

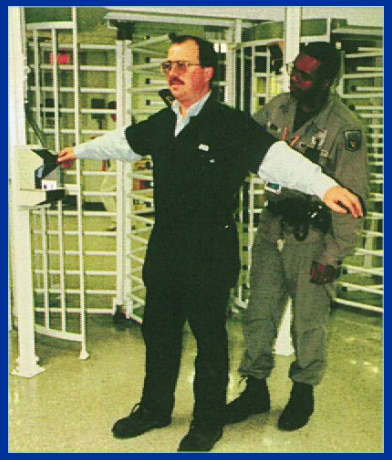


Protected Area Access Control

- You will need a security clearance and documentation of having passed SAT or SART ("Good Guy" letter).
- Receive a photo badge, they may take biometric information – retinal scan or palm print, a TLD may be issued (note instructions on where to store your plant-issued dosimeter).
- You will need to "key card" through a turnstile; biometric information may be checked before granting you access.
- Your NRC badge does NOT provide you unescorted access into the Protected Area.
- Wear PPE when and where required (note where to find the PPE – safety glasses, hardhat, hearing protection).
- Note the escort requirements from "Site Specific Training," e.g., 10 to 1.
- Entering the protected area is like entering an airport security area.


Security
Office
#4





Vital Area Access Control

- **Additional "Key Card," access turnstiles may be encountered.**
- **More rigorous escort requirements (e.g., 5 to 1).**

Even the President of the United States cannot enter a Vital Area of a nuclear plant if he/she does not have unescorted access to that area.

Conduct

Owner Controlled Area – The owner controlled area begins at the owners property. You may be requested to present identification. Additionally, you vehicle may be searched.

Conduct

Protected area - Search of vehicles and packages for firearms, explosives, incendiary devices. No cameras, weapons, explosives incendiary devices, alcohol, or drugs. I.D. badge must be displayed at all times. If escorted, you must stay with your escort at all times. Don't challenge the system - stay away from fences and barriers.

Conduct

Vital Area - In addition to protected area requirements, don't pull on doors before they unlock; don't tailgate during ingress/egress.

Material access areas - contains Special Nuclear Material (SNM); must be located inside the protected area with at least 3 physical barriers. Must have at least 2 people.

Conduct

Signs & Postings – In addition to radiological information, there are signs and postings as well as barriers and boundaries to warn you of potential safety hazards. You are responsible for adhering to site safety instructions and procedures.

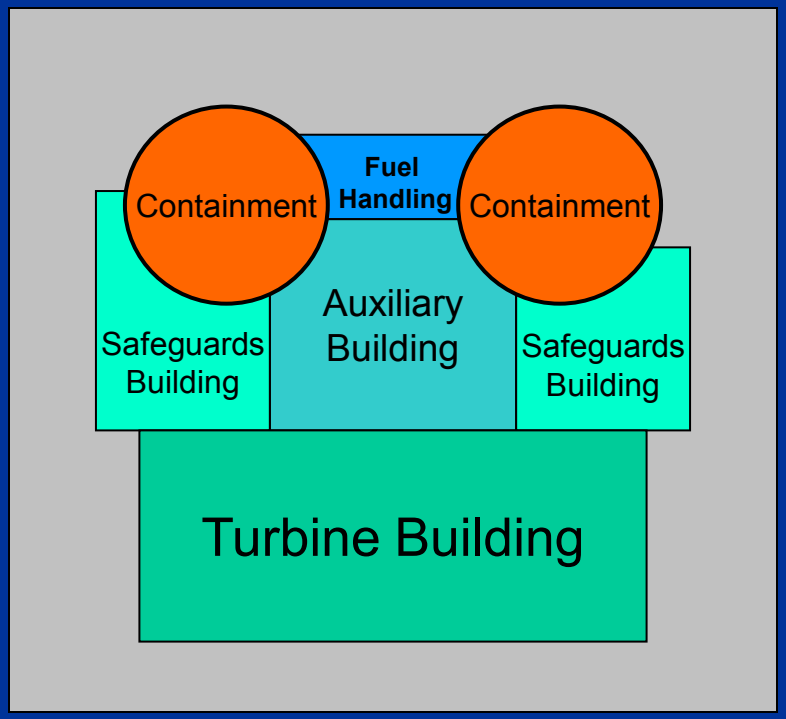
Safety Tags – provide information of potential hazards and communicate special requirements. Only qualified personnel may remove tags and operate components or systems. Components with "Danger" tags may cause injury, death or equipment damage.

Site Layout

- Familiarize yourself with the site layout.
- Know where you will enter and exit the plant, e.g., the “gate house.”
- Identify buildings you will be visiting or where you will be meeting people.
- Learn where the “RCA” (radiological controlled area) access location is located.
- Know where your assembly area is, where the lunch room is & where you are to park your car.

Plant Layout

- **Within the Site Layout is the "Plant Layout."**
- **Familiarize yourself with the building names, the associated radiation protection and security designations.**

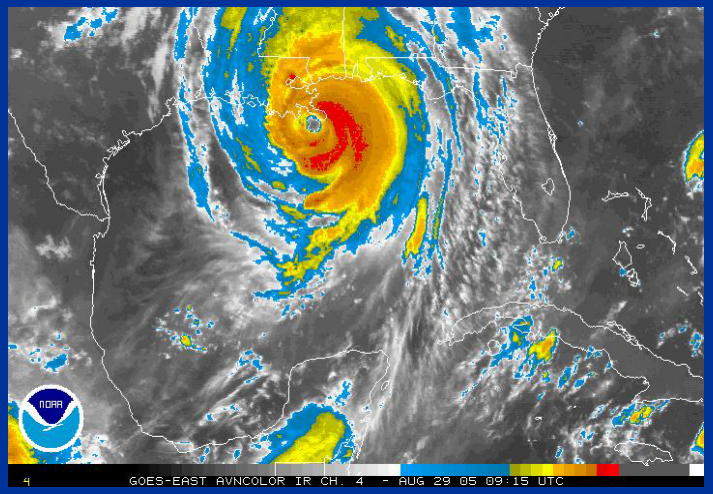


Emergency Classifications

There are 4 levels (EAL) for designating emergency events. In order of <u>increasing</u> severity, they are:

1) **Notification of unusual event – Events are in progress or have occurred which indicate potential degradation in the level of safety of the plant. No release of radioactive material requiring offsite response or monitoring is expected unless further degradation occurs.**

<u>Examples:</u>
Unplanned small rad releases
Fire not extinguished w/in 15 min.
RCS leakage above Tech Specs
Confirmed security event



Emergency Classifications

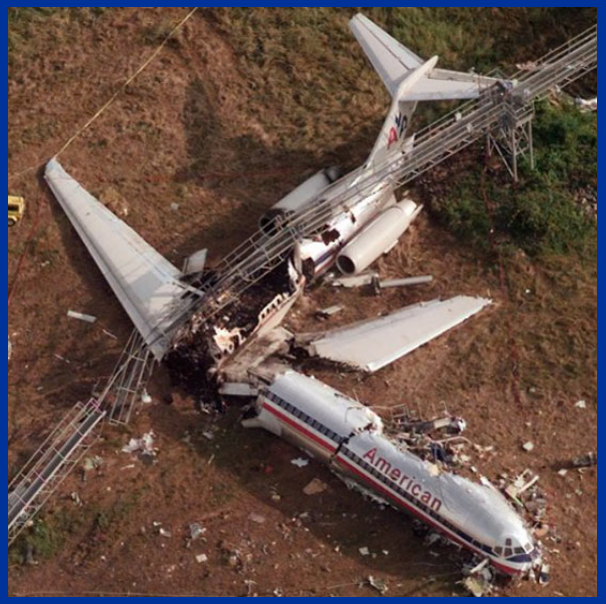
2) Alert - events are in process or have occurred which involve an actual or potential substantial degradation in the level of safety of the plant. Any releases of radioactive material from the plant are expected to be limited to a small fraction of the Environmental Protection Agency (EPA) protective action guides (PAGs).

<u>Examples:</u>
Loss of emerg AC for > 15 minutes
Fuel damage or vessel level too low
Rad leakage > 200X effluent T/S
ATWS
CR evacuation

Emergency Classifications

3) **Site Area Emergency - Events are in process or which have occurred that result in actual or likely major failures of plant functions needed for protection of the public. Any releases of radioactive material are not expected to exceed the EPA PAGs except near the site boundary.**

Examples:
Loss of ALL emerg AC (SBO)
ATWS and manual trip unsuccessful
Offsite dose exceeds 100 mR TEDE
Site attack or security event in Vital Area
CR evacuation and no control



Emergency Classifications

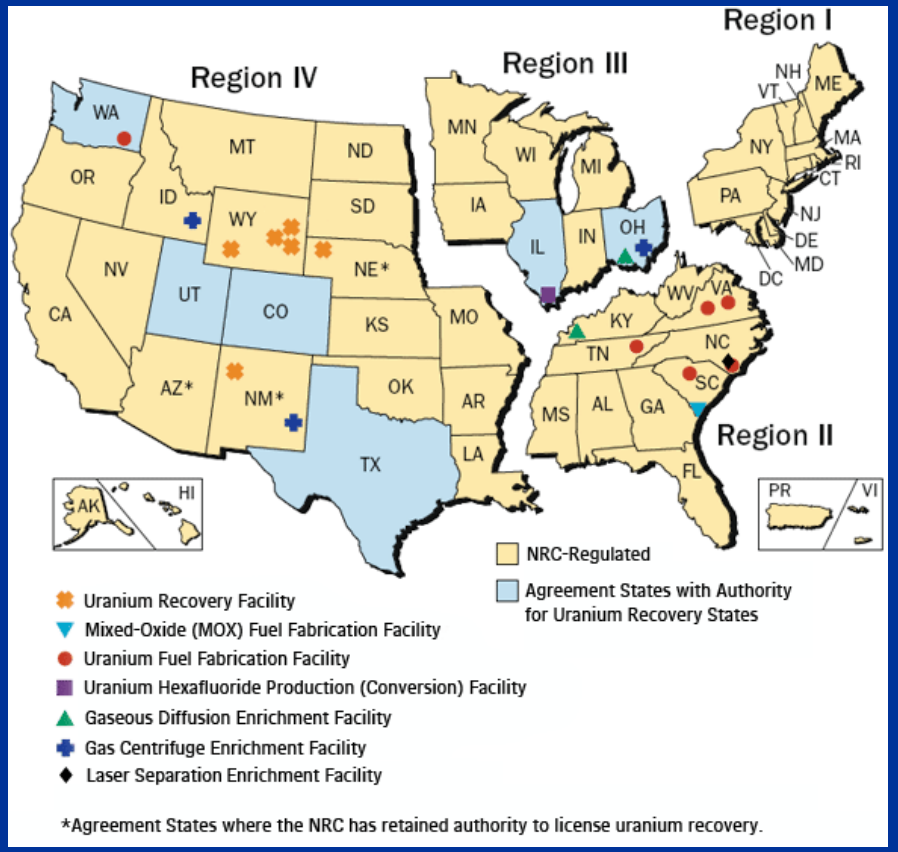
4) General Emergency - Involves actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity. Radioactive releases during a general emergency can reasonably be expected to exceed the EPA PAGs for more than the immediate site area.

   Plant evacuation is usually required for Site Area and General Emergencies.

   Report to your assigned assembly area as instructed during site-specific training.

Plant Emergencies

Nuclear materials and fuel cycle facility licensees have a similar set-up that uses ALERT and SITE AREA EMERGENCY levels.

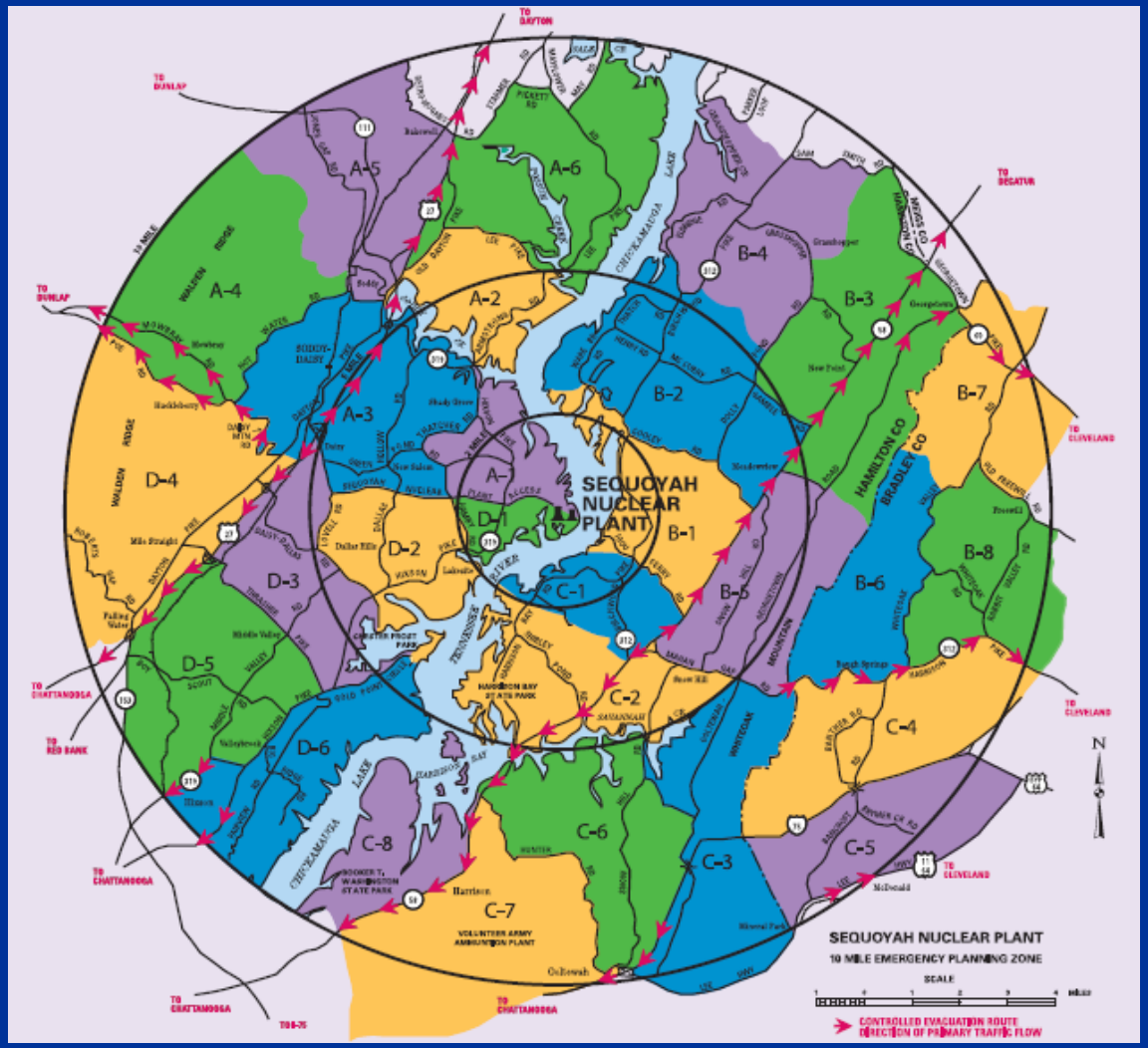


For ALL nuclear plants: Plant evacuation is <u>usually</u> required for Site Area and General Emergencies.

Report to your assigned assembly area as instructed during site-specific training.

Emergency Planning

- Sites have emergency plans that identify different sectors. They can identify protective actions by sector in the event of a release of radioactive material to the environment.



Emergencies and Drills

There are other types of emergencies that are not radiological, such as medical, and fire. In addition, drills and exercises may be conducted to test the response to various emergencies. There are different alarms for these various emergencies. It is important that you understand the various alarms and your appropriate response during site-specific training.

Some fire suppression systems will purge areas of oxygen to control the spread of fire. It is important that you evacuate these areas as directed.

If you are assigned to an Incident Response, you will be provided with additional information on the emergency conditions by the NRC site or regional response coordinator.

Incident Response

If you are assigned to an Incident Response Team, you will be provided with additional information on the emergency conditions by the NRC site or regional response coordinator.

Potassium-iodide (KI) is used to reduce the amount of radioactive iodine (I-131) that is absorbed in the body. A single dose of 130 mg administered prior to the release is effective for 24 hours. Administration prior to exposure is more effective. People with known sensitivity to iodine should avoid taking KI. KI will distributed by the Agency to Agency personnel.

Site Specific Training

Even when you have your NRC Site Access Training and security clearance complete, you will need to attend site-specific training for each site you visit. You will learn information such as how to respond if you see or are involved in a medical emergency or a fire. You will learn what various alarms mean for the site. You should learn what the appropriate emergency phone numbers are for the site for fire, medical, or security emergencies.

Review

- Learn the emergency notifications/alarms for fire, medical, and security emergencies.
- Know where your assembly area is located from site-specific training.
- Become familiar with the site layout to help you conduct your job effectively and efficiently. Know where to park, where the "gatehouse" is for accessing the protected area, where the lunchroom is, your assembly area, and where the health physics office is including the RCA entry and exit areas and the whole body counting system.