



Brunswick Nuclear Plant Emergency Preparedness

Public Education

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REP Planner

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Overview of Topics

- History and overview of the Brunswick Nuclear Plant
- How Energy is made
- Protective Barriers
- Basics of Radiation
- What is Reasonable Assurance
- Emergency Classification Levels (ECLs)
- 10-Mile Emergency Planning Zone
- How the public is notified
- Protective Actions
- Resources



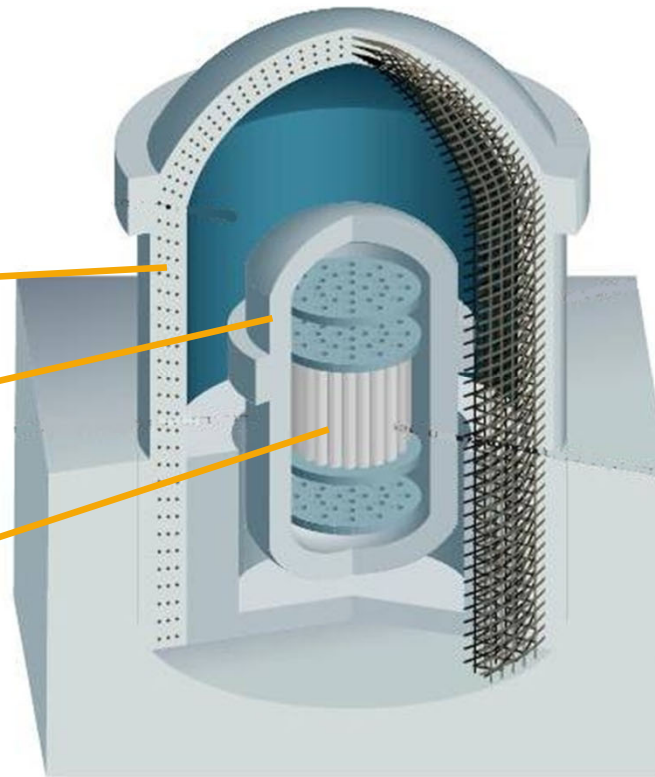
Protective Barriers

Barriers:

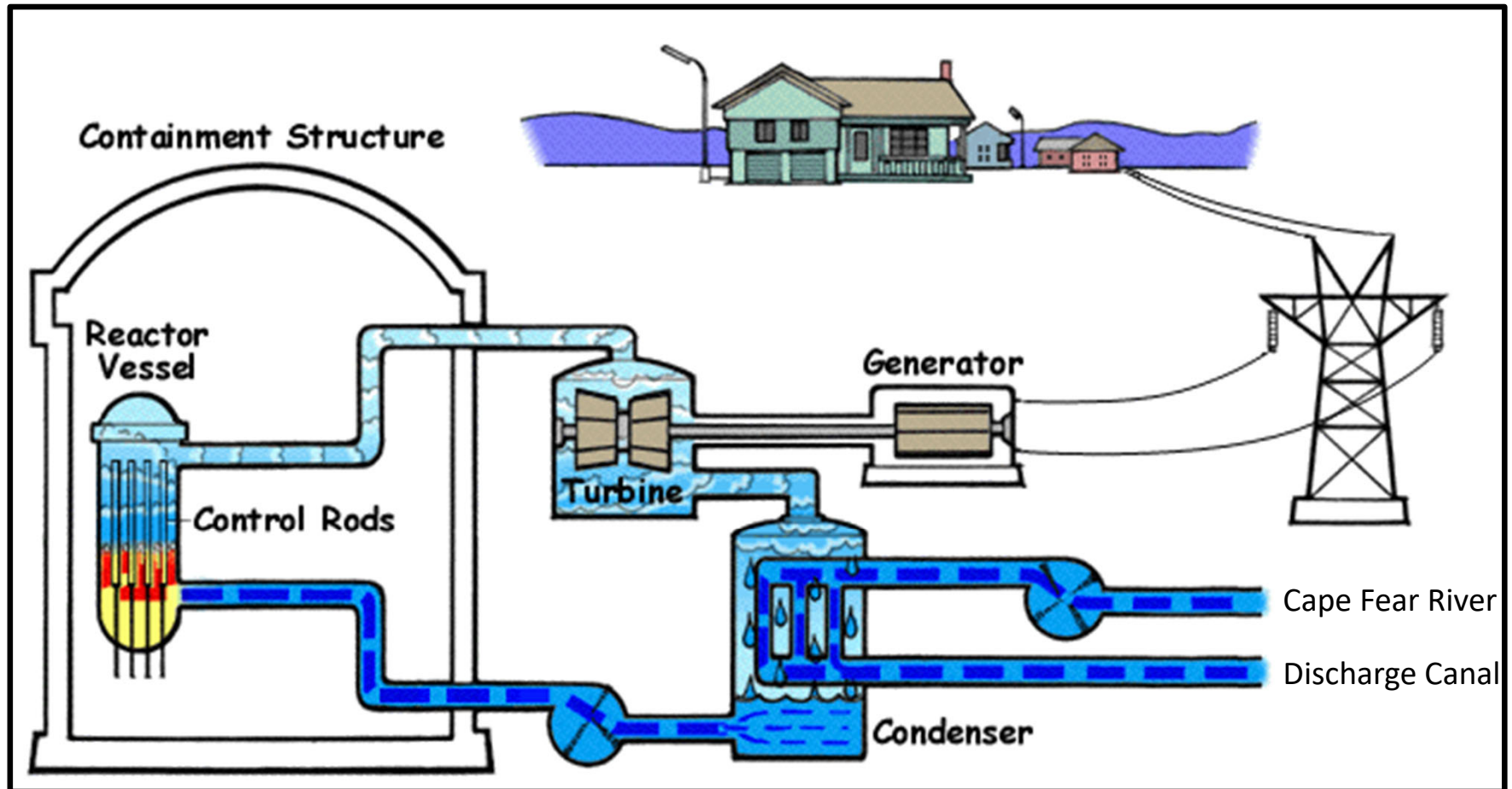
Containment
Building

Reactor Vessel

Fuel Cladding

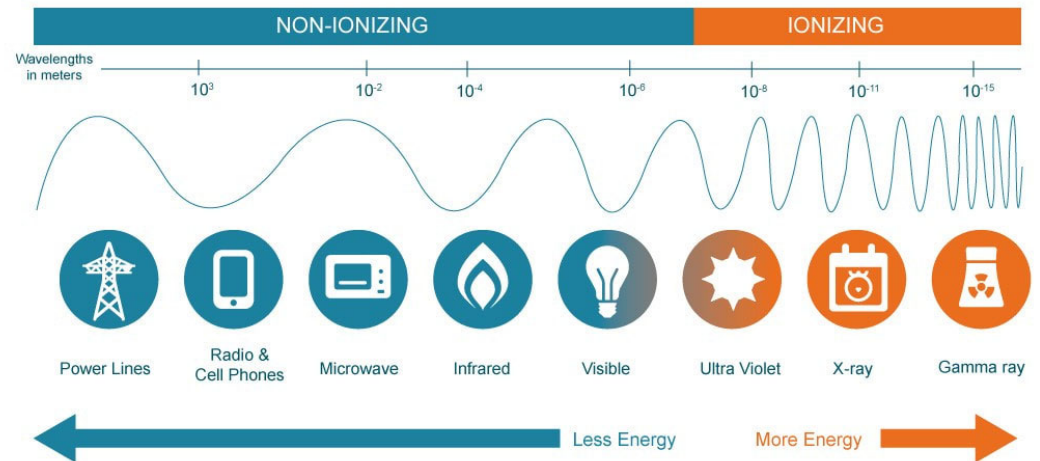


Boiling Water Reactor (Brunswick Nuclear Plant)



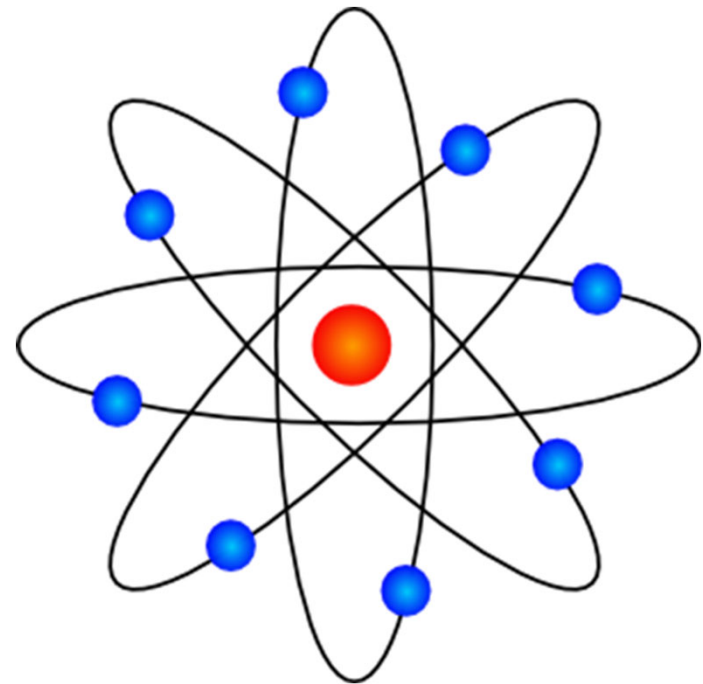
Basics of Radiation

- Non-ionizing radiation is a form of low energy radiation not capable of displacing ions in our atoms.
- Ionizing radiation is a form of high energy radiation that is able to displace ions in our atoms.



Basics of Radiation

- Radiation is an ever-present part of our environment.
- Ground
- Sky
- What we eat
- Medical Treatments
- Nuclear Power Plants
- Much more...



Sources of Radiation

Natural

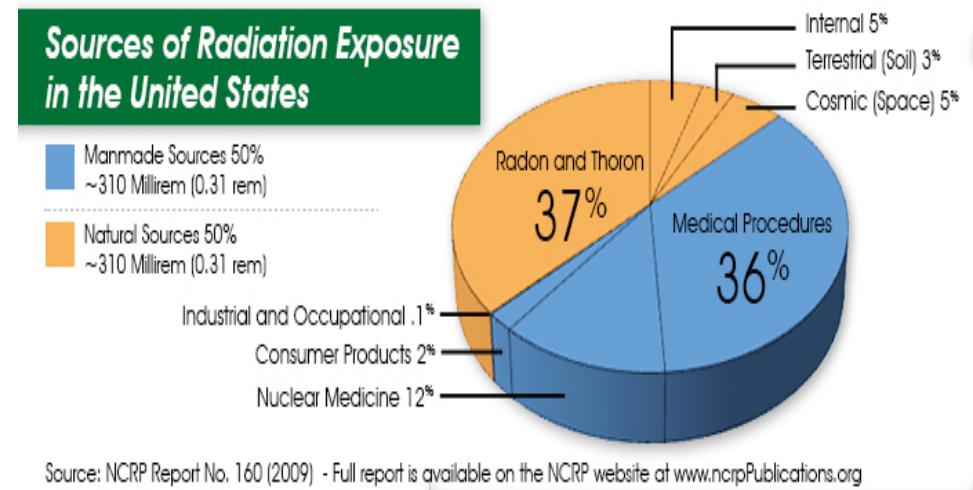
- Cosmic and Terrestrial Sources
 - Solar Wind/Flares
 - Cosmic Rays
 - Radon Gas
 - Potassium-40 (bananas, water, soil)
 - Uranium-238 and Thorium-232 (rock, soil)

Man Made

- Nuclear medicine
- X-Rays
- Smoke Detectors
- Watches and Clocks
- Ceramics and Glass
- Tobacco

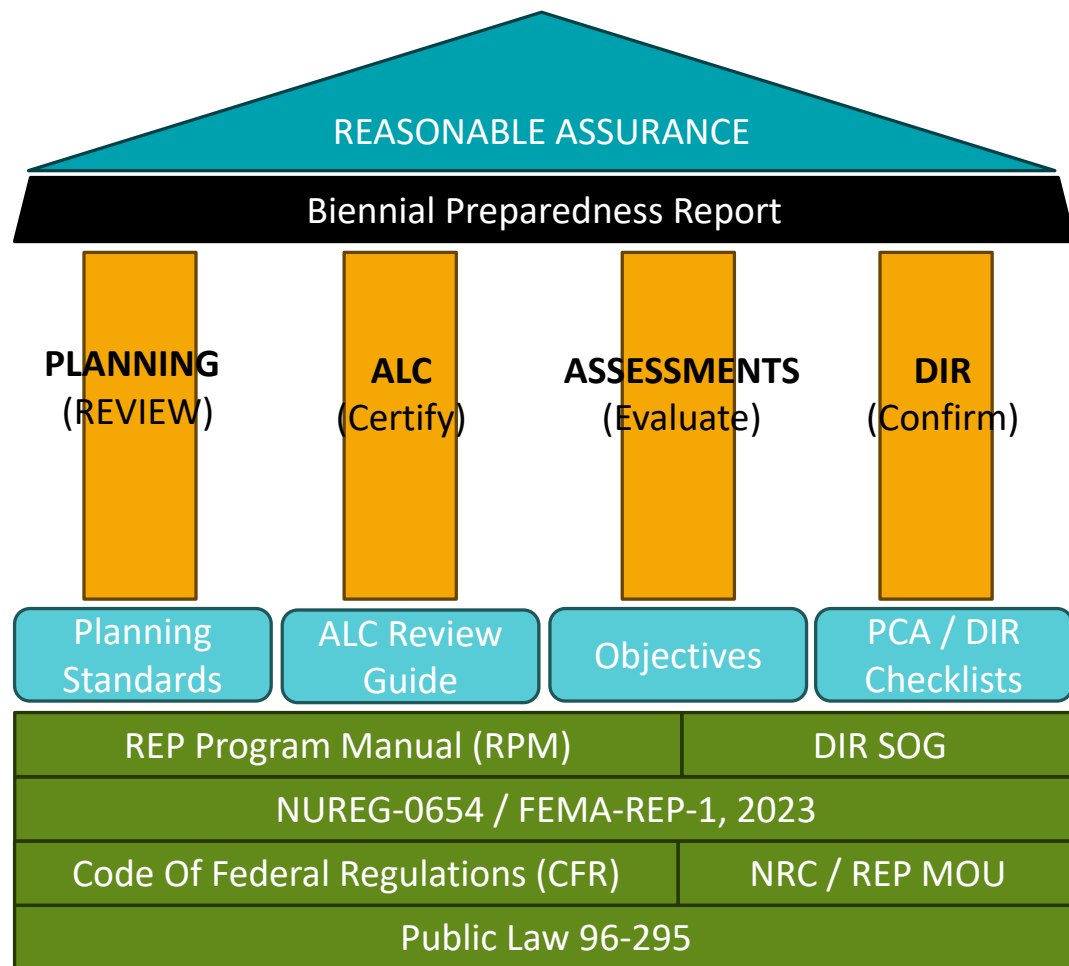
Average Yearly Exposure

- The average American receives approximately 620 millirem of radiation annually, split roughly 50/50 between natural background sources (radon, cosmic) and man-made sources (medical, consumer products). The largest single source of exposure for the general public is radon gas.



Reasonable Assurance

FEMA defines Reasonable Assurance within the Radiological Emergency Preparedness (REP) Program as a determination that offsite emergency plans and preparedness for state, local, and tribal governments are adequate to protect public health and safety in the emergency planning areas surrounding commercial nuclear power plants (NPPs).



8-Year Cycle of Training and Exercises

[illegible]

Emergency Classification Level (ECL)

Plant-specific indications, conditions or instrument readings which are used to classify an emergency as an Unusual Event, Alert, Site Area Emergency or General Emergency.

EVENT CLASSIFICATION	DEFINITION	ANTICIPATED ACTIONS
UNUSUAL EVENT	This is the least serious of the four emergency classifications. It means there is an event at the plant, but it should not affect the public.	- State and county officials would monitor the situation - May notify senior management officials if radiological incident or potential for media interest
ALERT	This is an event that could impact the safety at the plant. There still is no danger to the public. State and county officials and the utility might decide to activate their emergency centers, just in case the situation gets worse.	- State and county officials would continue to monitor the situation - May assemble the County EOC staff - May initiate Waterway Warning - May notify response agencies of situation if radiological incident or potential for media interest - May notify Brunswick and/or New Hanover County Public School officials, to alert of situation
SITE AREA EMERGENCY	This event likely impacts the safety of the plant, but not enough to pose a danger to the public. The sirens will be sounded to alert the public to listen to local radio and television stations for information and instruction.	- Fully activate EOC - May activate sirens in coordination with other EPZ county - Will close schools in 10 mile EPZ - Will evacuate waterway and park areas - Will issue press releases with information to the public
GENERAL EMERGENCY	This is the most serious event that could occur at the plant. State and county officials would take action to protect the public. Sirens will be sounded and local radio and television stations will give instructions to the public living in affected areas. They would be instructed to stay indoors or evacuate.	- Fully activate all emergency response resources - Will close schools in 10 mile EPZ and take other appropriate actions - Will make recommendations to public on seeking shelter or evacuation of the area - Will coordinate all response with state and federal authorities - Will issue press releases with full information on the situation - Consider need for KI

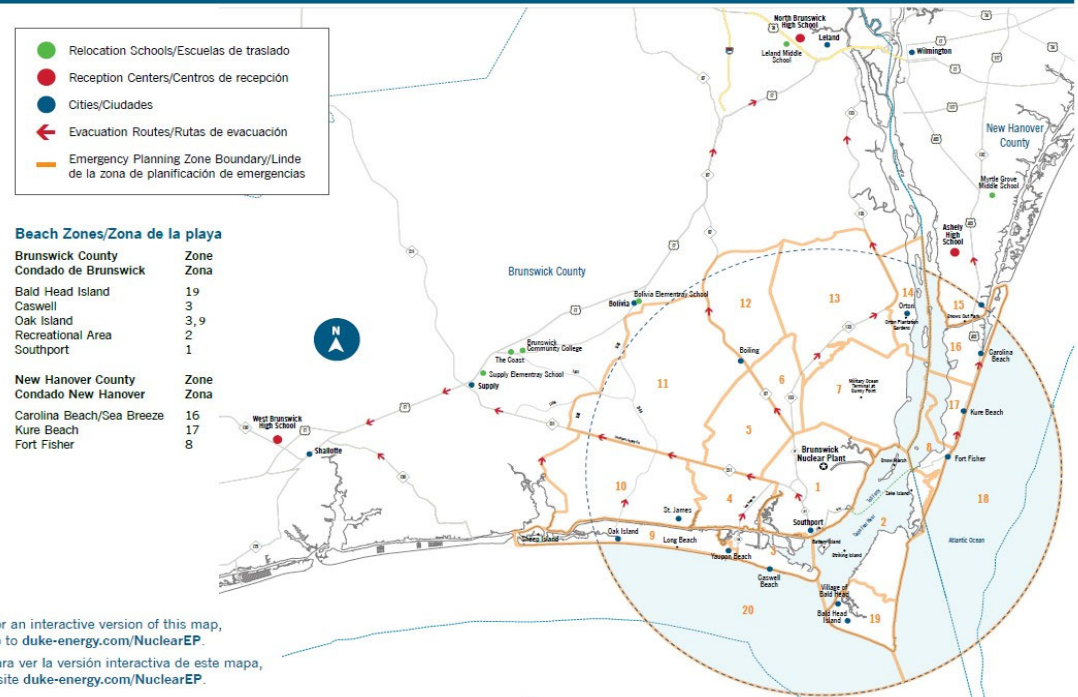
Radiological Response Phases

Potential Exposure Pathway	Incident Phase		Protective Actions
1. External Radiation from Facility	Early Phase		1. Sheltering, Evacuation, Control of Access
2. External Radiation from Plume			2. Sheltering, Evacuation, Control of Access
3. Inhalation of Radioactivity in Plume			3. Sheltering, Administration of Potassium Iodide, Evacuation, Control of Access
4. Contamination of Skin and Clothes			4. Sheltering, Evacuation, Decontamination of Persons and Animals, Including Household Pets and Service Animals and Owners
5. External Radiation from Ground Deposition		Intermediate Phase	5. Evacuation, Relocation, Decontamination of Land and Property
6. Ingestion of Contaminated Food			6. Food and Water Controls
7. Inhalation of Re-Suspended Radioactivity			7. Relocation, Decontamination of Land and Property
		Late Phase	

10-Mile Emergency Planning Zone

- Is made of 20 subzones (1-20)
- Covers 10 miles surrounding the Nuclear Plant
- Allows for Protective Actions to be directed at specific Subzones or to the entire EPZ

Brunswick Nuclear Plant | Emergency Planning Zones, Shelters/Reception Centers and Relocation Schools
Planta Nucleoeléctrica Brunswick | Zonas de planificación de emergencias, Centros de recepción y Escuelas de traslado



Notifications

- **What do I do when I hear the Sirens.**
 - The sirens are apart of the Alert and Notification System. They are an outdoor alerting tool.
 - When you hear them go inside and tune into local news and media. Brunswick County will be providing more information to inform the public.
 - Information on what has happen
 - What actions you the public need to take if necessary.
- **Wireless Emergency Alerts (WEA)**
 - Same as the Presidential Alert System
 - These notifications go directly to your cell phone
- **Emergency Alert System**
 - TV and radio notifications
 - Scrolling banner on TV's
- **Press Releases**
 - Public Information Officers provide more detailed information to the media to inform the public.
- **DO NOT EVACUATE UNLESS INSTRUCTED TO DO SO.**

Integrated Public Alert and Warning Systems



Emergency Alert System (EAS)

Monitor Radio or TV Stations for official instructions

TV, radio, NOAA weather and other government communication channels repeat the messages.



Radio Stations

97.3 WMNX
98.7 WRMR



Wireless Emergency Alerts (WEAs)

Emergency Communications sent directly to your cell phone

Same information is provided via ReadyBrunswickCounty NC.gov

IoT Devices (Internet of Things) i.e. Electronic Billboards, Cell Phones, Smart TV's, etc.



NOAA Weather Radio

KHB31 – Winnabow, NC
Frequency 162.550 MHz

County Coverage
Brunswick County
037019



US Coast Guard Notice to Mariners

Band	Channel	Frequency
VHF-FM	16	156.8 MHz
HF		2182.0 KHz

What do I need to do and when

- **Before an emergency, know:**

- Your EPZ zone
- Your evacuation route
- Your designated reception center or shelter
- Where to get official emergency information

- **During an emergency:**

- Follow instructions for your specific zone.
- Do not assume other zones will receive the same instructions.
- Always follow the most current instructions from emergency management officials, even if they differ from the general guidance in this guide.

What if I need addition help

- If you need assistance and are not pre-registered, call your county emergency management office as soon as possible and follow official instructions.
- People who need rides or other assistance should follow county emergency management instructions and use pre-arranged assistance resources when available.
- Visitors, temporary residents and others who need assistance should also contact local emergency management officials for instructions during an emergency.
- **Who should register for special assistance with their local emergency management office?**
 - Requires transportation assistance
 - Has mobility, medical, or cognitive needs
 - Needs help during an evacuation

Protective Actions



Go Inside Stay Inside



Shelter-in-Place



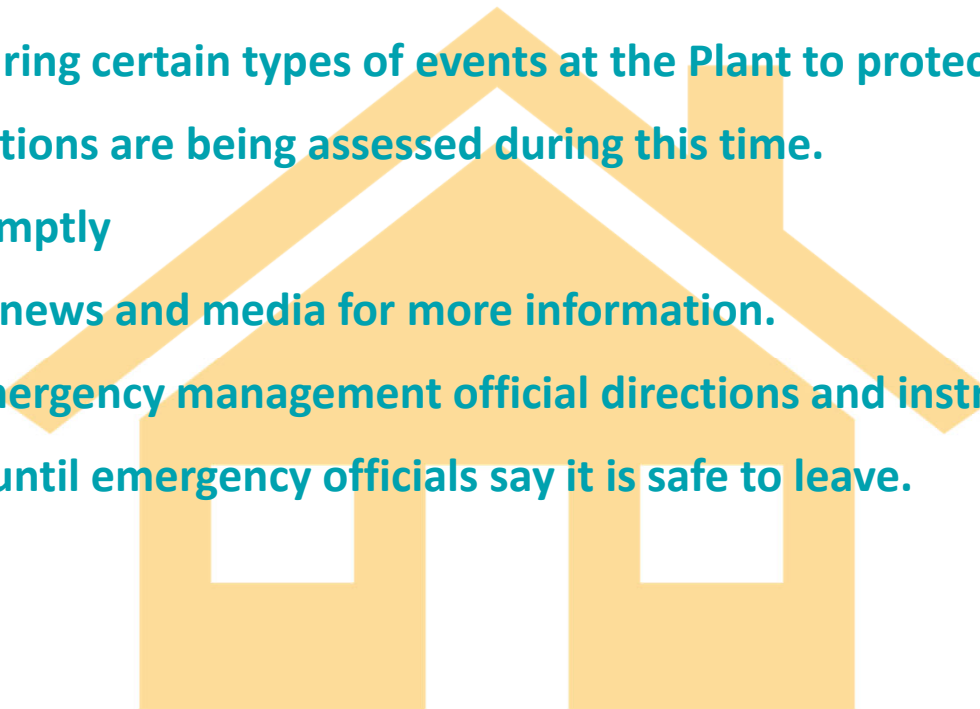
Evacuate



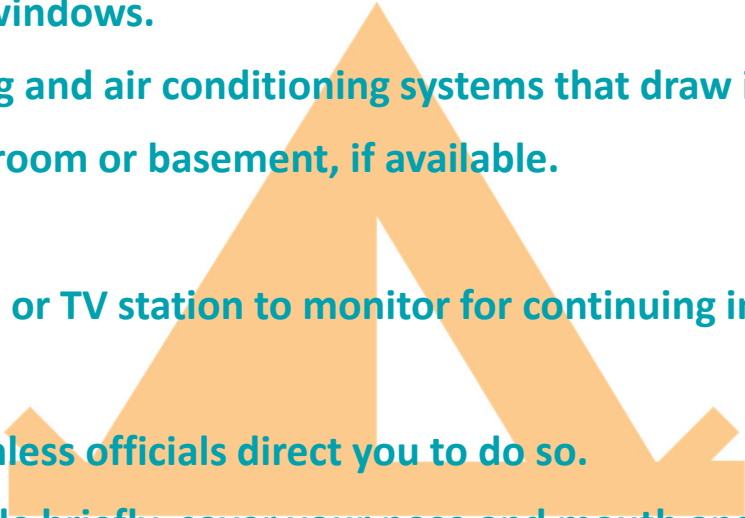
Take Potassium Iodide

Go Inside Stay Inside

- Maybe used during certain types of events at the Plant to protect the public.
- Typically, conditions are being assessed during this time.
- Go indoors promptly
- Tune into local news and media for more information.
- Follow local emergency management official directions and instructions.
- Remain inside until emergency officials say it is safe to leave.



Shelter-in-Place

- Go indoors at once.
 - Close all doors and windows.
 - Turn off fans, heating and air conditioning systems that draw in outside air.
 - Move to an interior room or basement, if available.
 - Bring pets inside.
 - Tune to an EAS radio or TV station to monitor for continuing instructions.
 - Limit phone use.
 - Do not go outside unless officials direct you to do so.
 - If you must go outside briefly, cover your nose and mouth and return indoors as quickly as possible.
- 

Evacuation to Shelters

- Pack only essential items
- Take your pets
- Secure your home
- Know your route
- Prepare your vehicle
- Stay Informed
- Follow directions



Potassium Iodide

- **BLOCKING AGENT**
 - Prevents the body from absorbing radioactive iodine **only**.
- **EFFECT FROM SINGLE DOSE LAST 24 HOURS**
- **TWO TABLETS ... 65 mg each (130 mg adult does)**
- **NEVER TAKE “KI” IF ALLERGIC TO IODINE**
- **Available at Brunswick County Health Department**



Reception Center Location

- **Brunswick County Reception Centers are cojoined with our Congregate Care Facilities (Shelters).**
 - Radiological monitoring occurs
 - Decontamination for the public along with companion and service animals
 - Support and Resources for the public
 - Potassium Iodide distribution
 - Mental health service
 - Sheltering
- **Locations for Reception and Congregate Care Facilities**
 - North Brunswick High School
 - 114 Scorpion Ln, Leland NC 28451
 - West Brunswick High School
 - 550 Whiteville Rd, Shallotte NC 28470

Schools and Childcare

- If your child's school is located within the 10-mile EPZ, do not go to the school during an emergency unless officials specifically direct you to do so. School officials will follow approved emergency procedures for the school's zone. If students are relocated, parents and guardians should pick them up only at the designated relocation or pickup site and follow instructions from school and emergency management officials.
- If your children are ever home alone, make sure they know what to do in an emergency. They should know their emergency zone and understand your family's emergency plan.

Additional Resources and Information

- **Duke Energy**

- www.duke-energy.com/safety-and-preparedness/nuclear-safety/brunswick

- **Brunswick County Emergency Management**

- <https://brunswickcountync.gov/306/Nuclear-Disasters>

- **North Carolina Emergency Management**

- <https://www.ncdps.gov/our-organization/emergency-management/nuclear-emergency-preparedness>

- **FEMA**

- FEMA.gov
- Ready.gov

Thank You!

Any Questions?



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