



**Byron Generating Station**

# Byron Generating Station

- **Groundbreaking - 1975**
- **Unit 1 online - Sept., 1985**
- **Unit 2 online - August, 1987**
- **Each unit can generate more than 1200 megawatts - serves about 1.1 million customers**
- **700 Exelon employees**
- **Approximately \$25 million in annual property taxes**



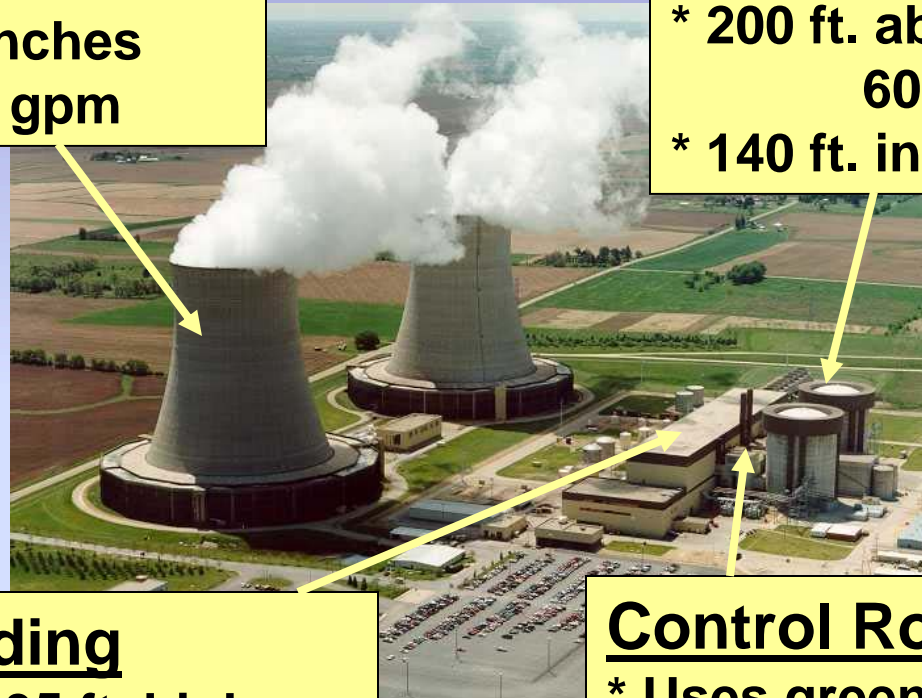
***Located on 1,782 acres  
just outside  
Byron, Illinois, about 90  
miles west of Chicago***

## Cooling Towers

- \* 495 feet high
- \* 605 feet base diameter
- \* Thickness varies from 8 to 36 inches
- \* Flow - 750,000 gpm

## Containment Bldg.

- \* 3-1/2 ft. steel reinforced concrete walls
- \* 1/4-inch steel liner
- \* 200 ft. above grade & 60 ft. below grade
- \* 140 ft. in diameter



## Turbine Building

- \* 730 ft. long, 135 ft. high
- \* Each unit has 1 high pressure turbine and 3 low pressure turbines
- \* 1.5 million horsepower

## Control Room

- \* Uses green board concept
- \* More than 11,150 light bulbs
- \* Monitor plant systems & equipment



Byron IL



LaSalle IL



Braidwood IL



Dresden IL

Quad Cities IL



# Exelon <sup>SM</sup>



Three Mile Island, PA

**17 Units**

**Largest fleet in U.S.**



Clinton IL

Peach Bottom PA

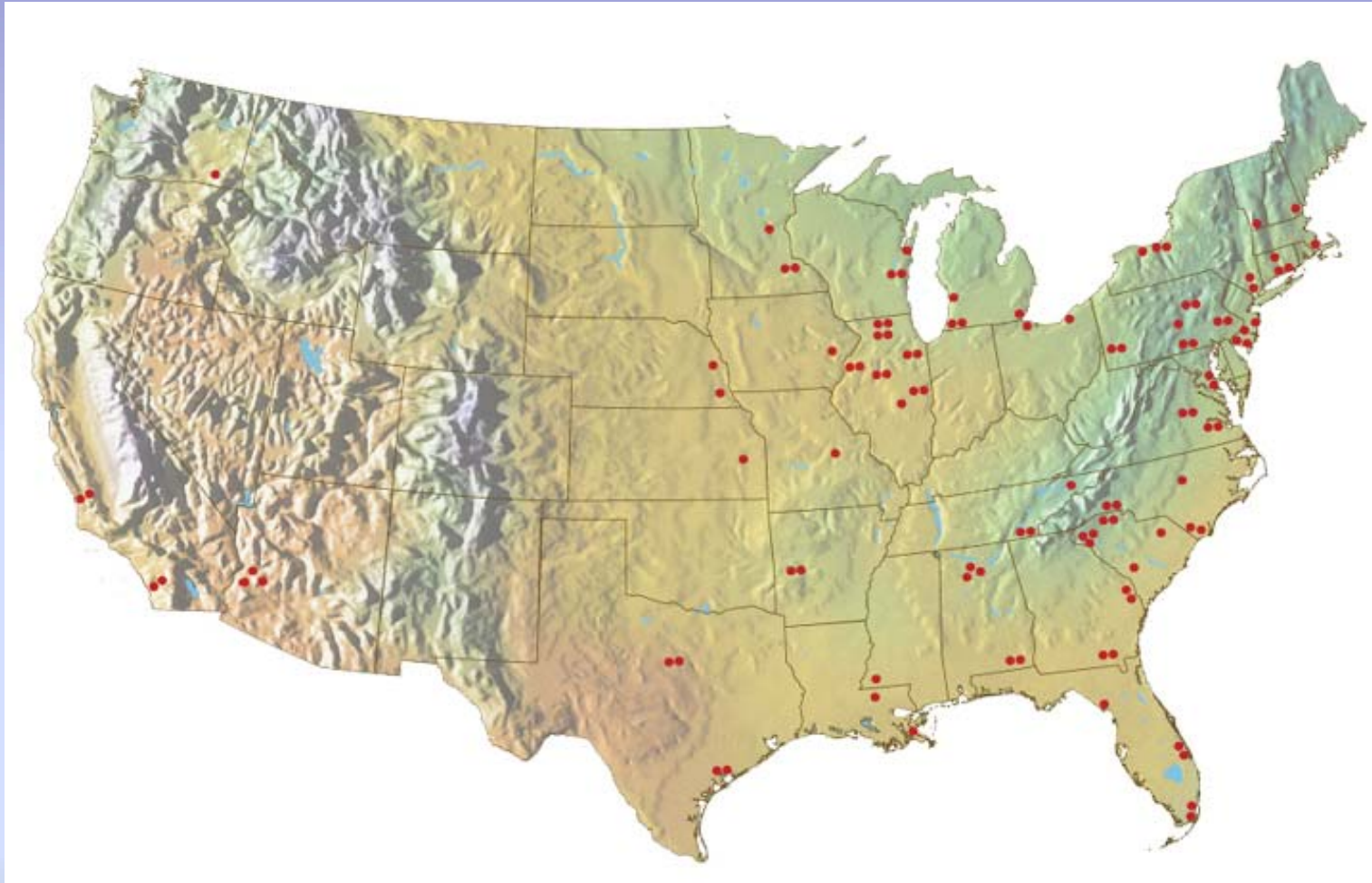


Limerick PA

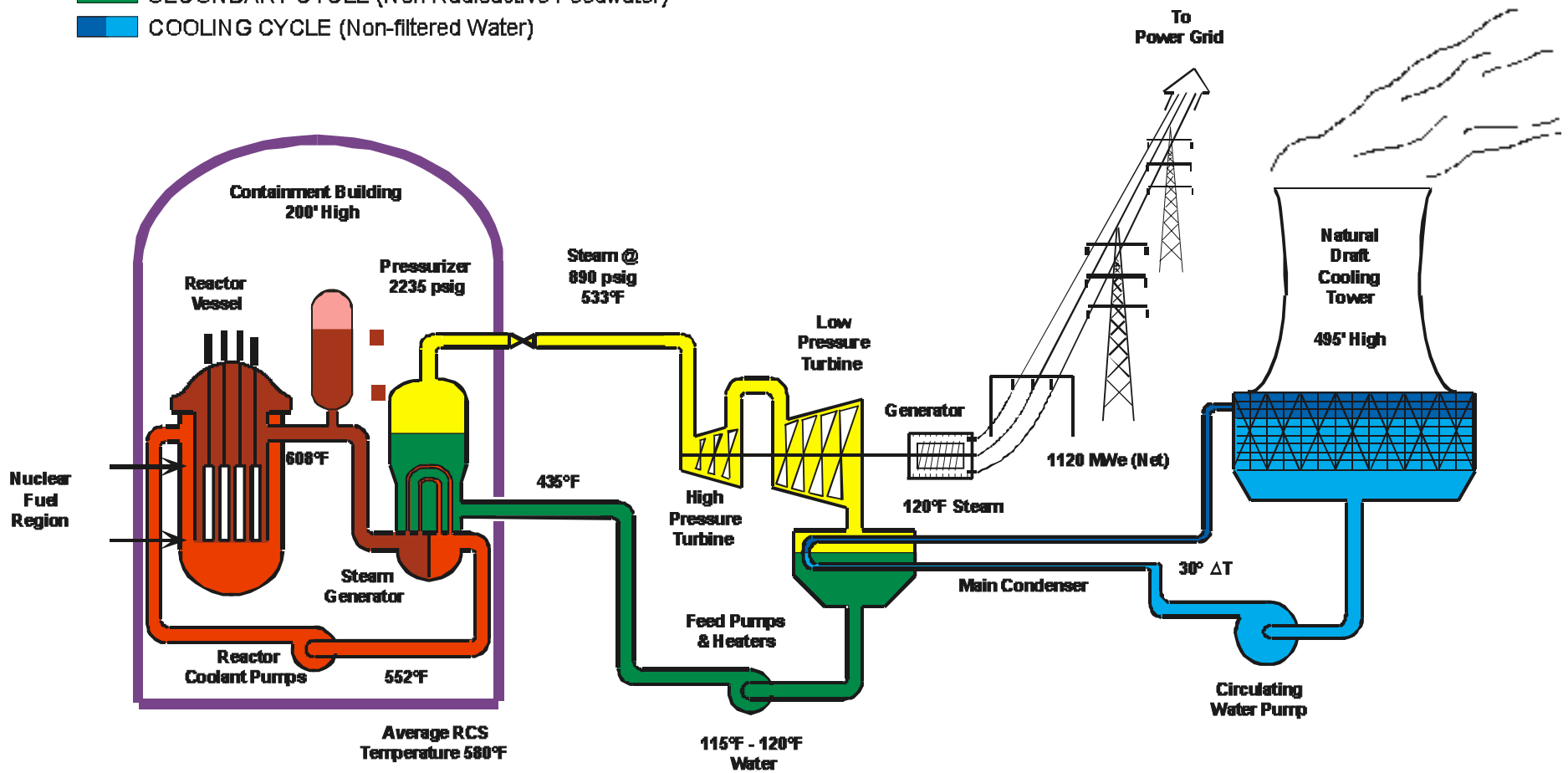


Oyster Creek NJ

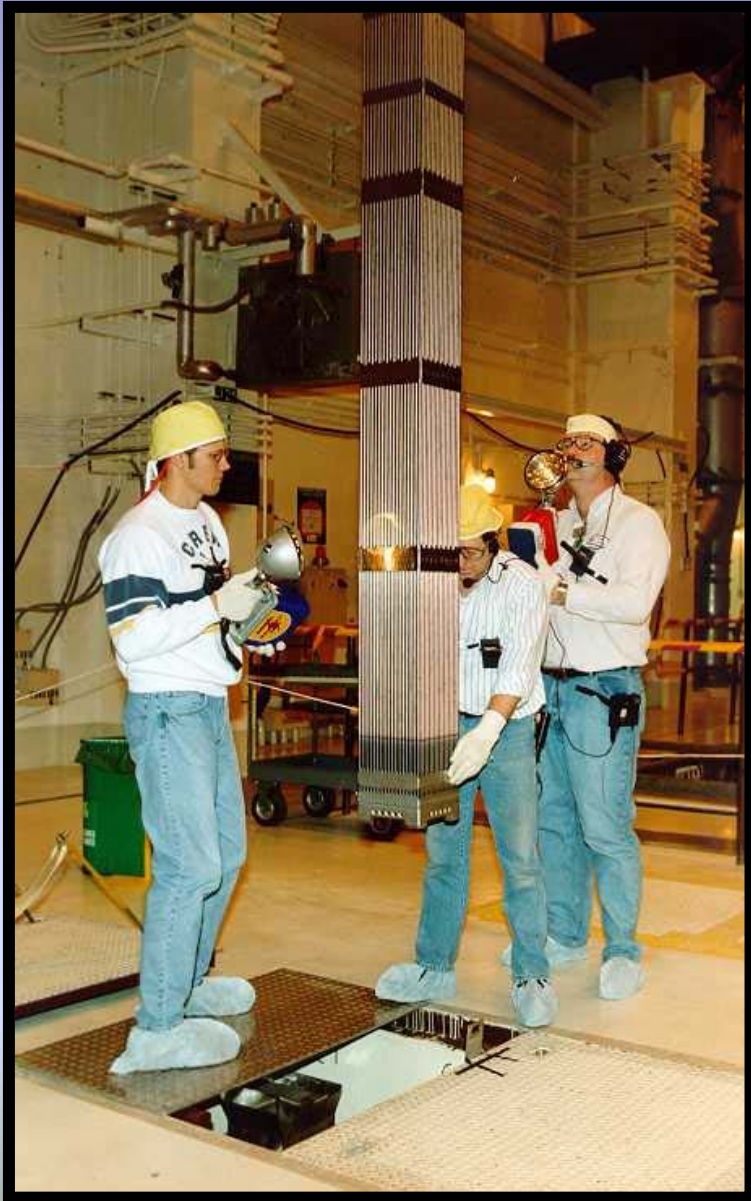
# 103 Nuclear Power Reactors



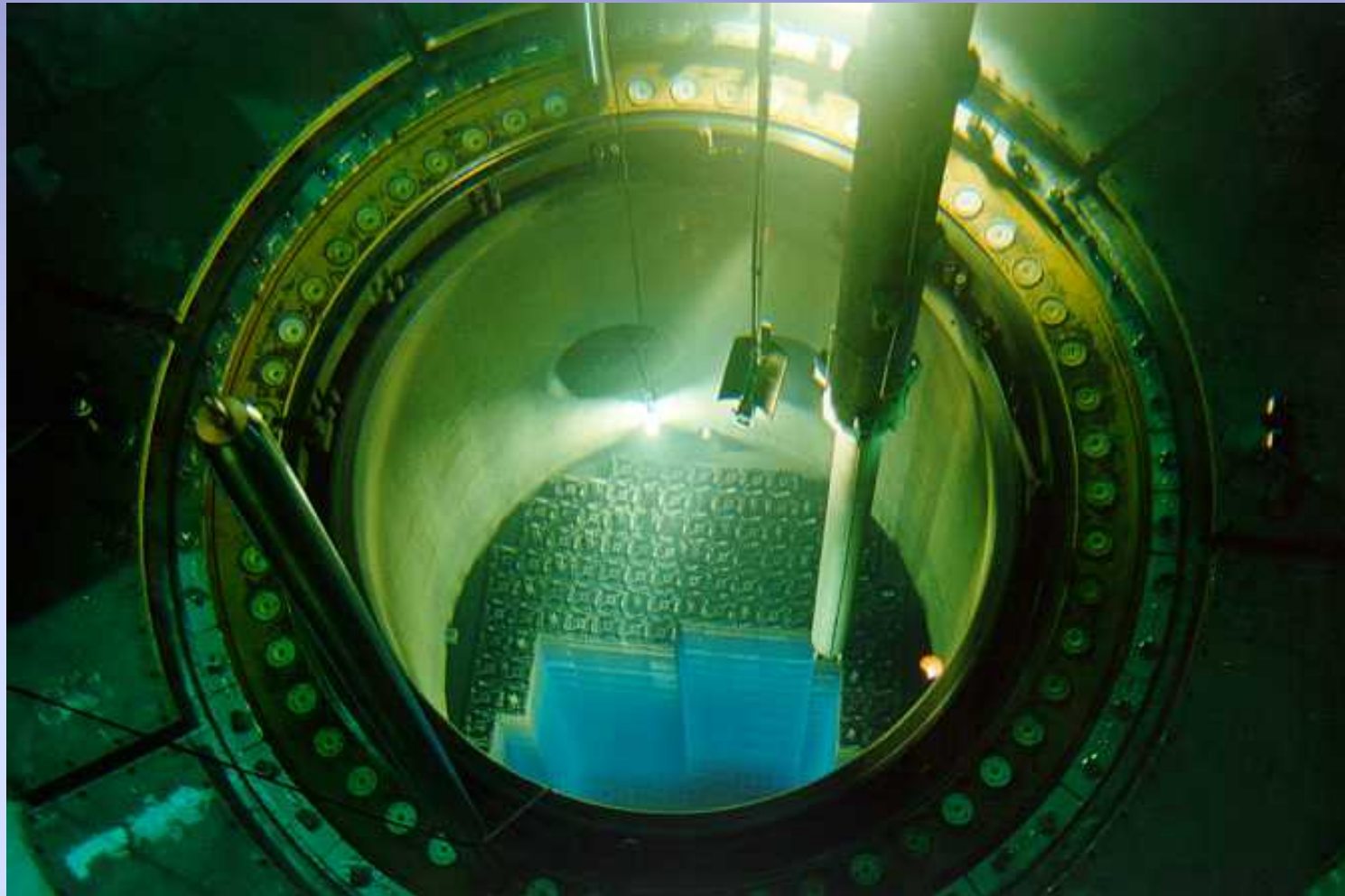
- PRIMARY CYCLE (Reactor Grade Water)
- SECONDARY CYCLE (Non-Radioactive Steam)
- SECONDARY CYCLE (Non-Radioactive Feedwater)
- COOLING CYCLE (Non-filtered Water)



**Pressurized Water Reactor**



**Inspecting  
Fuel Assembly**



**Fuel Assembly Movement in Reactor Core**



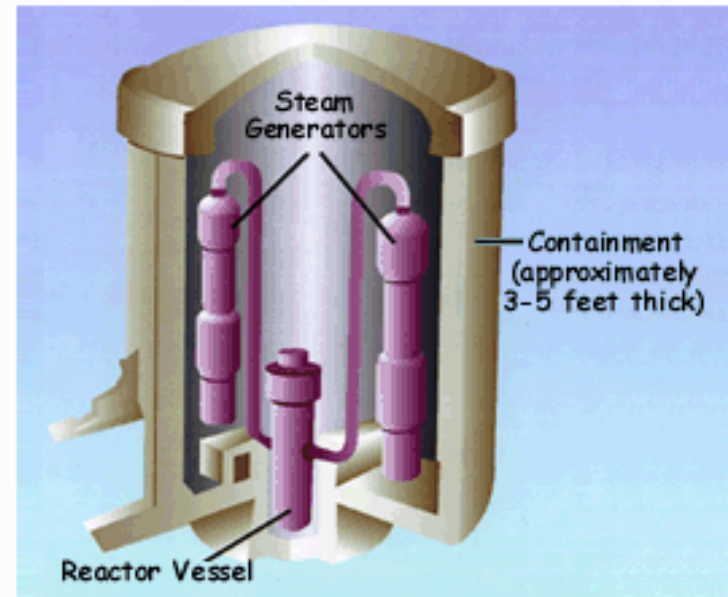
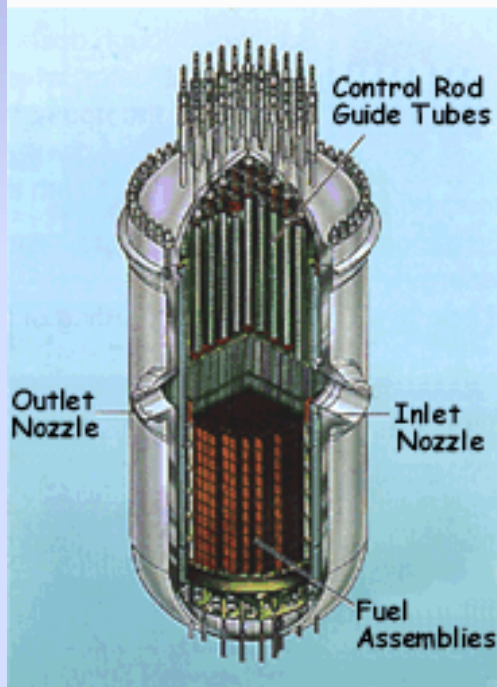
**Turbine Deck**

# Radiation

- Measured in units called rem or millirem
- Typically exposed to 360 mrem each year
- Strict standards in place to protect workers and public from radiation
- High-level waste: fuel pellets & assemblies – stored on site
- Low-level waste: cloth & paper wipes, shoe covers, filters and resins – properly packaged and shipped to proper location

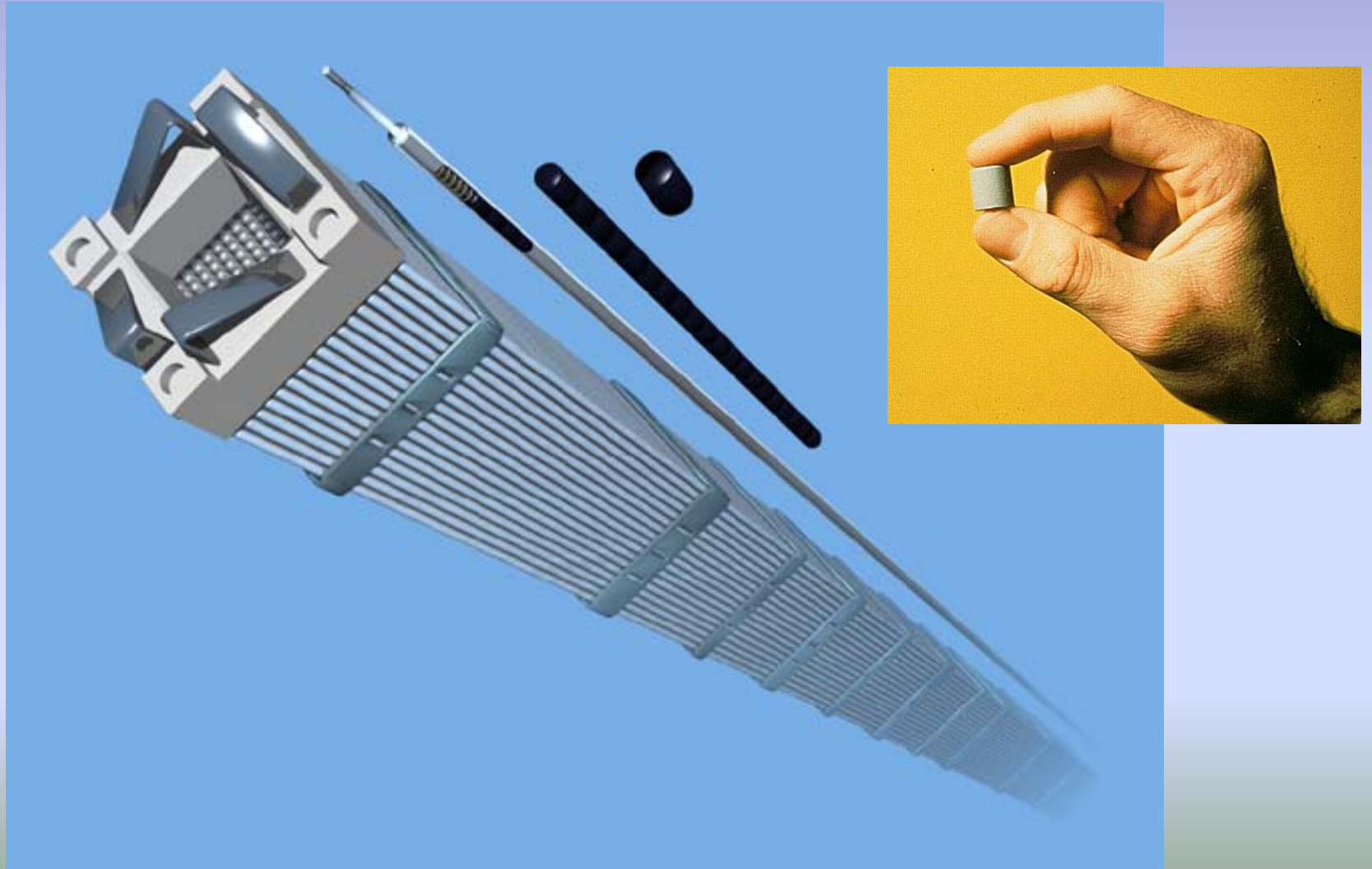
# Multiple Layers of Protection

Inside small ceramic pellets encased in long metal rods

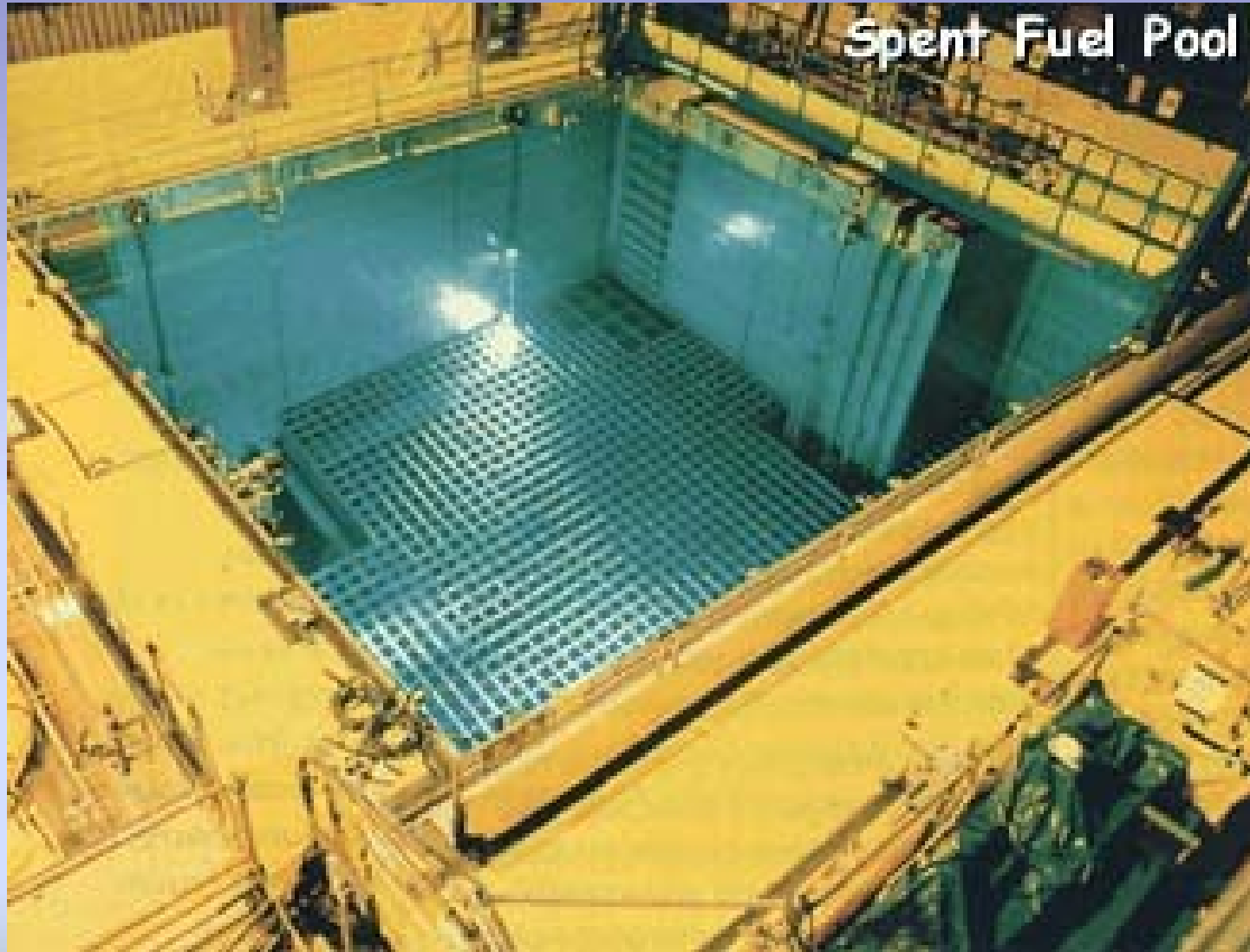


Inside a reactor vessel, enclosed in a concrete and steel containment building, with walls 3-5 feet thick

# Fuel Rods Filled With Pellets Are Grouped Into Fuel Assemblies



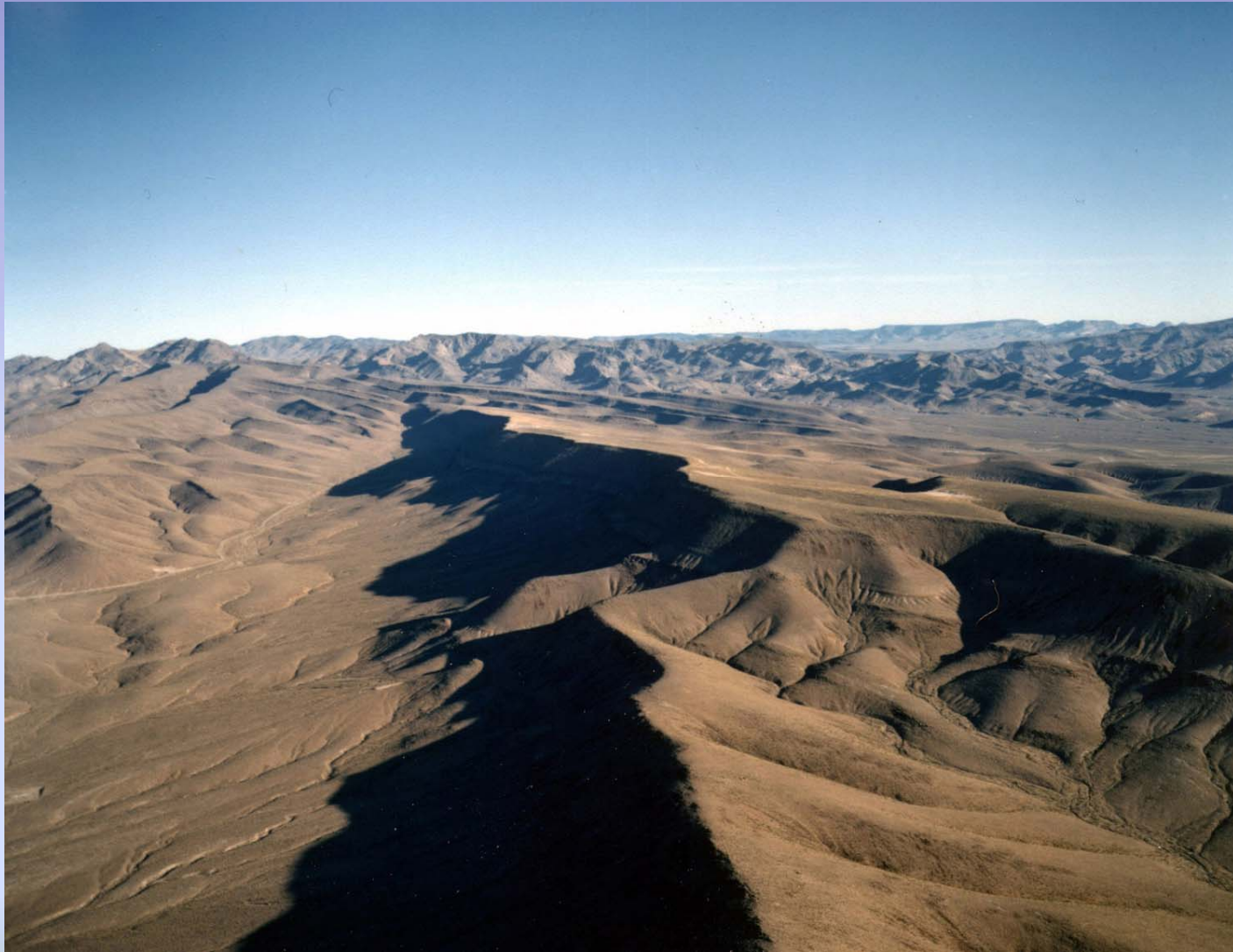
Spent Fuel Pool



# Temporary Dry Storage On Site



# **Yucca Mountain Project**



**Aerial view of the crest of Yucca Mountain.**

# Tritium Properties

- Tritium (chemical symbol H-3) is a radioactive isotope of the element hydrogen (chemical symbol H).
- Although tritium can be a gas, its most common form is in water
- Radioactive tritium reacts with oxygen to form water
- Like H<sub>2</sub>O, tritiated water is colorless and odorless.

# Sources of Tritium in the Environment

- Tritium occurs naturally in the environment in very low concentrations. Most tritium in the environment is in the form of tritiated water, which easily disburse in the atmosphere, water bodies, soil, and rock.
- In the mid-1950s and early 1960s, tritium was widely dispersed during the above-ground testing of nuclear weapons. Last test was 1963
- Commercial nuclear reactors, research reactors, and government weapons production plants (stopped production in 1988)

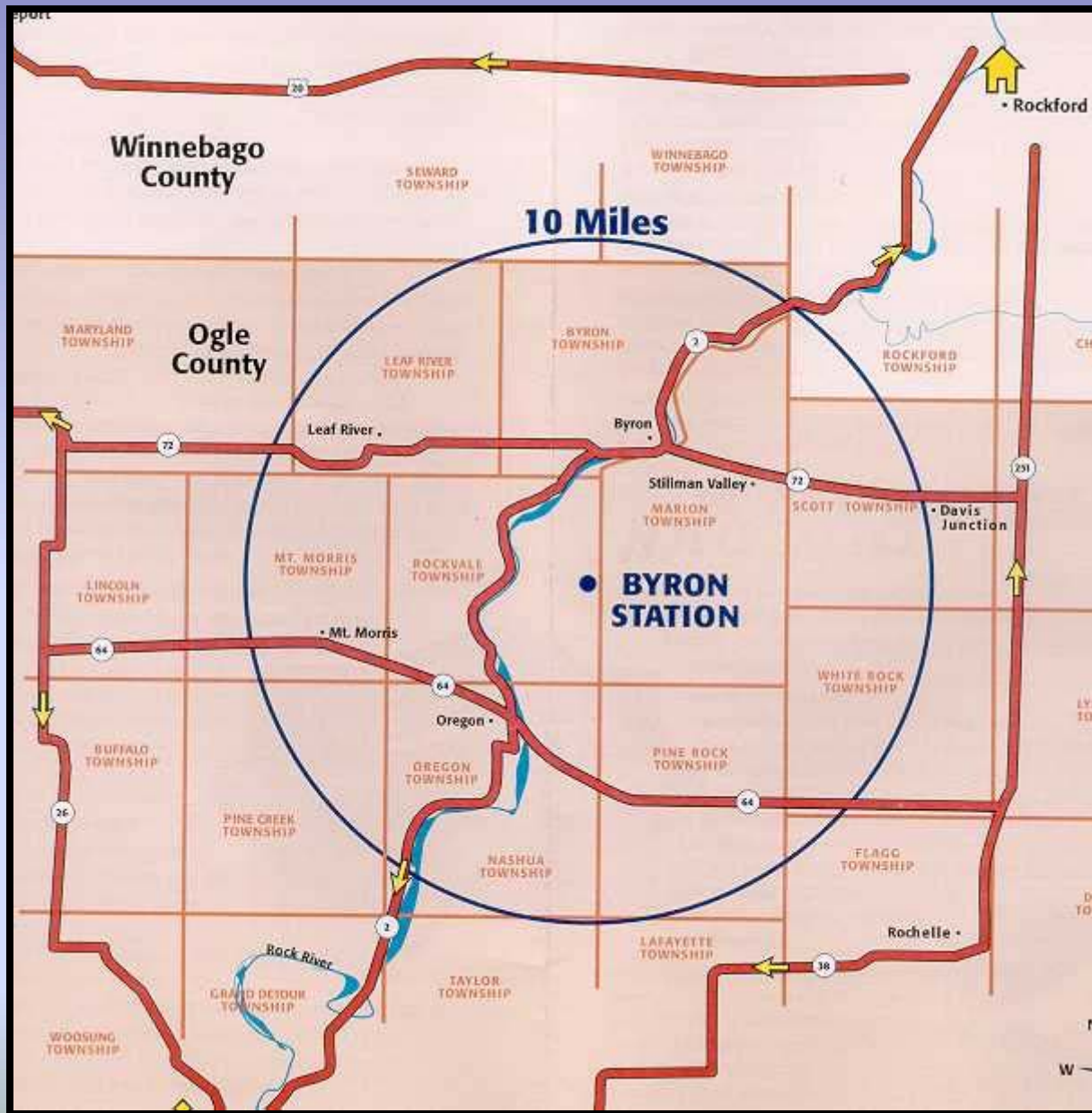
# Byron Station Actions

- Found tritium in standing water in vaults along pipeline to river
- Installing wells to monitor for migration
- Voluntarily tested wells of nearby homeowners
- NO detectable levels of tritium in wells

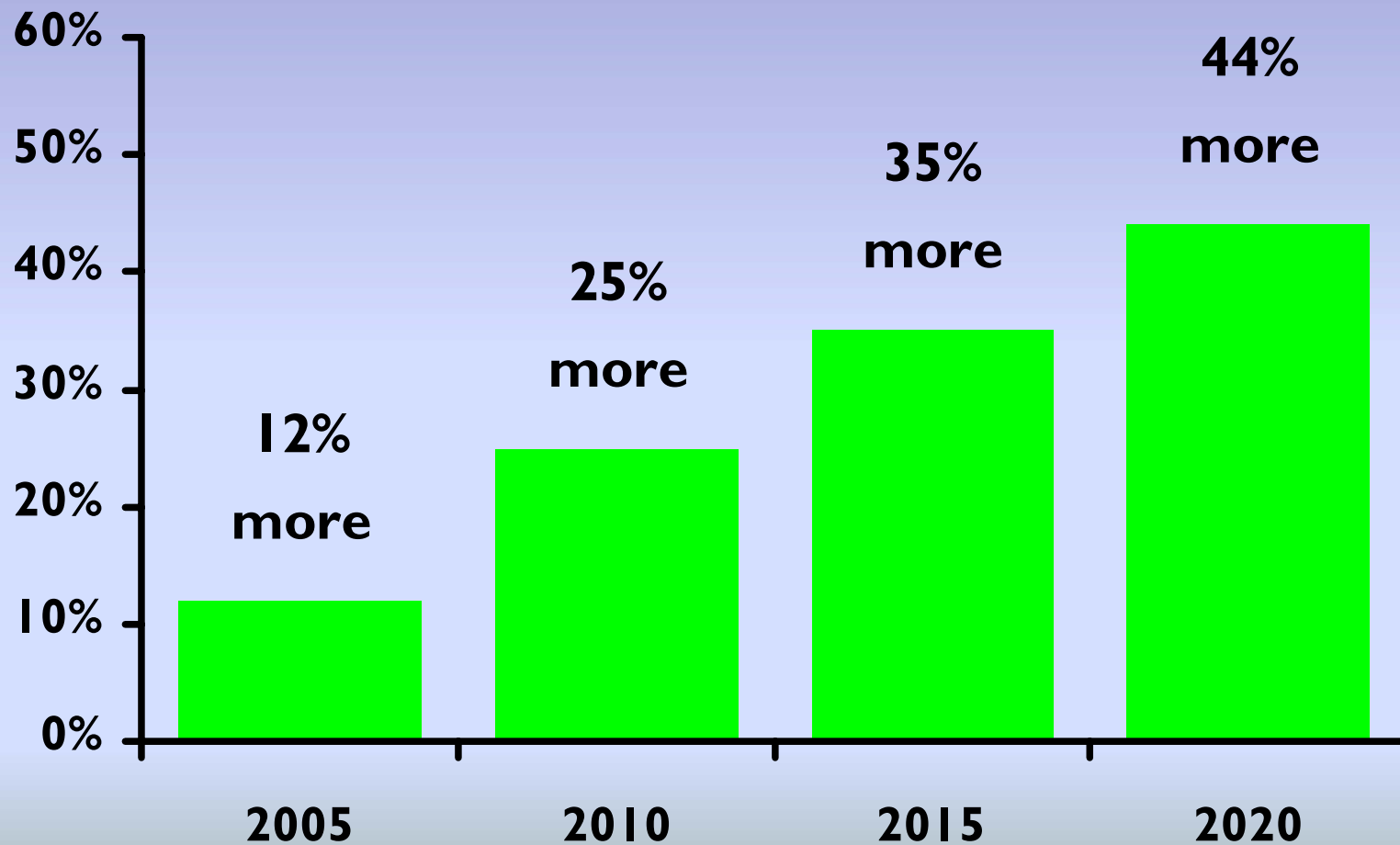


# Emergency Planning

- Primary objective in all we do is to preserve the health and safety of public and employees
- Defense-in-depth systems in place
- Continuous training / drills
- Work with off-site agencies on emergency preparedness
- EP Zone – 10 miles out



# By 2020, U.S. Electricity Needs Will Increase by 44%



Source: U.S. Department of Energy

# The Future of Nuclear Power

- **License Extension**

Gain 20 years of operation

- **Improved Performance**

- **Power Upgrades**

Byron Upgrade = 120 MW

- **Early Site Permit Process**

Three companies

- **New Research/Govt. support**

# Byron Security Enhancements

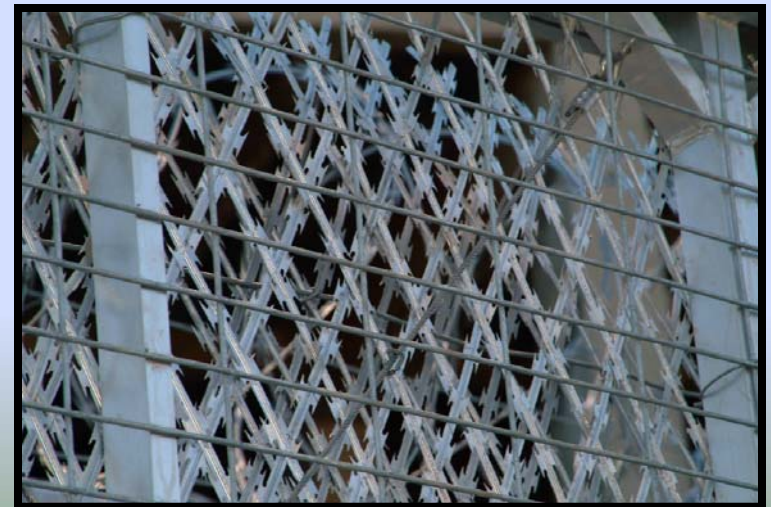
- On April 29, 2003, the NRC issued the Revised Design Basis Threat order requiring further improvements
- These changes were required to be completed by October 29, 2004
- Byron Station has met this requirement
- Investment of \$10+ million

# New Outer Barriers



# Delay Fences

- Installed 7,700+ feet of razor mesh and razor coil fence



# Sensor Devices

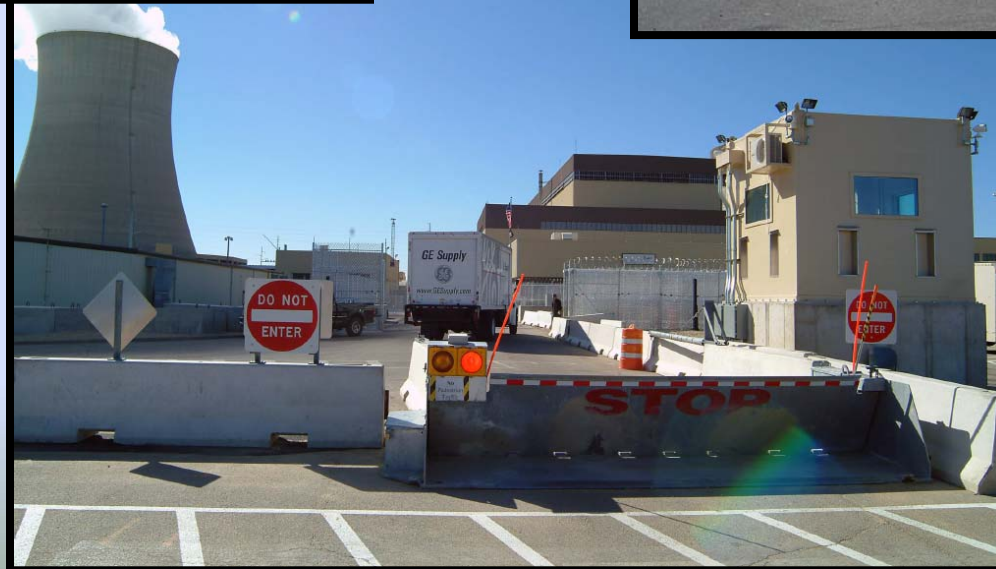
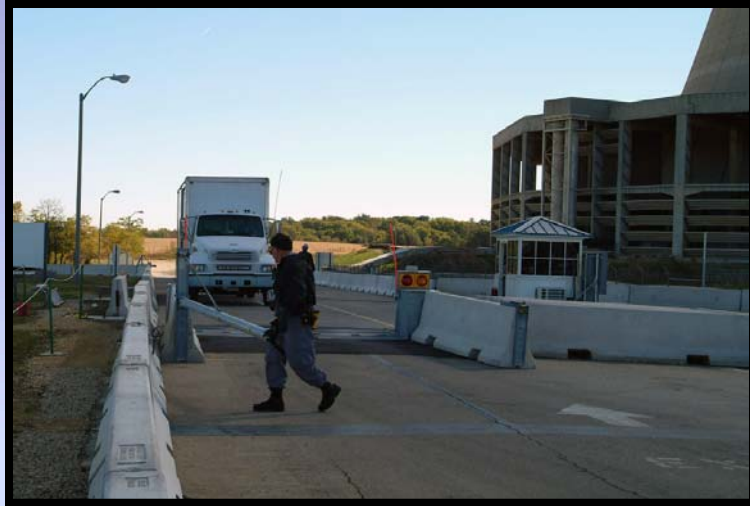
- Installed 11,500+ feet of sensor device system on delay fences



# New Hardened

# Vehicle

# Checkpoint



# Bullet Resistant Enclosures



- Strategically placed around the Byron Station facility.
- Range in height from 6 feet to 60 feet.

# Pre-Access Facility



# Comparative Size of Targets

**WTC**  
208' wide  
1,353' tall

**Containment Building**  
130' wide  
160' tall

**Spent Fuel Pool**  
80' wide  
40' tall

**Dry Casks**  
10' wide  
20' tall  
(12 depicted)

**Pentagon**  
1,489' wide (921' per side)  
71' tall

