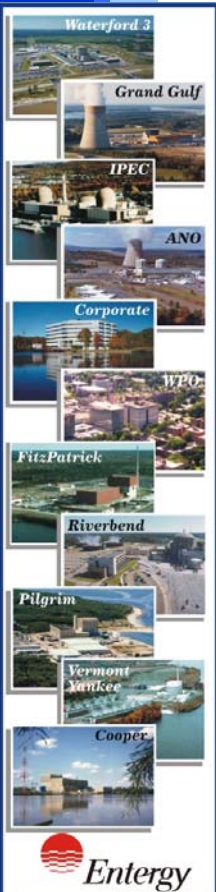


# James A. FitzPatrick Nuclear Power Plant

**ACRS License Renewal Subcommittee Presentation  
September 5, 2007**



# James A. FitzPatrick

## Personnel in Attendance

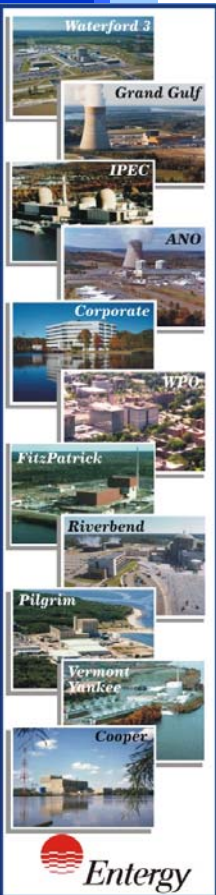
Brian Finn  
John McCann  
Garry Young

Site NSA Director  
Director of Licensing, White Plains  
Manager, License Renewal

Steve Bono  
Joe Pechacek  
James Costedio  
Alan Cox  
Rick Plasse  
Larry Leiter  
Tom Moskalyk  
Arturo Smith

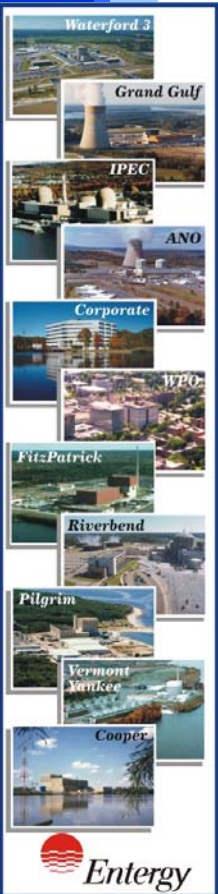
Director of Engineering  
Manager, Programs & Components  
Licensing Manager  
Technical Manager  
Licensing Lead  
Technical Lead  
Structural Lead  
Class 1 Mechanical Lead

Technical Support Personnel



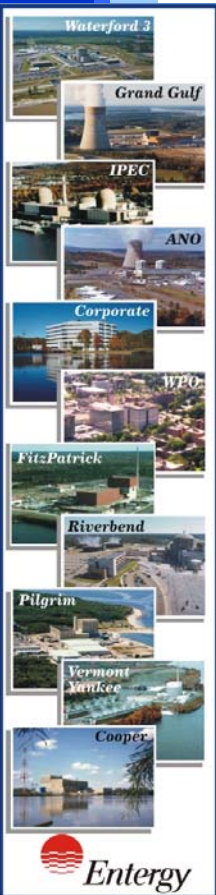
# Agenda

- James A. FitzPatrick Site Description
- Current Status
- James A. FitzPatrick Licensing History & Highlights
- License Renewal Project
- Cost-Beneficial SAMAs
- Presentation Topics
  - Drywell and Torus Monitoring
  - Torus Repair
- Questions



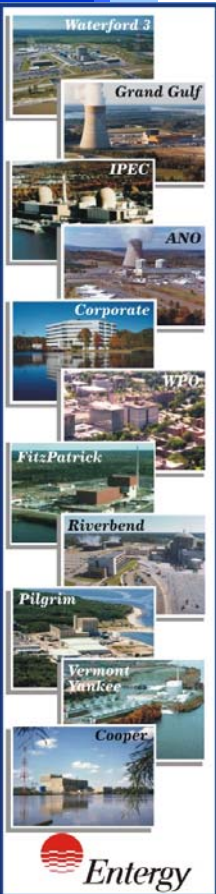
# JAFNPP Site Description

- General Electric (NSSS & TG), Stone & Webster (AE and Constructor)
- BWR-4, Mark I Containment
- 2536 MWt Thermal Power; ~ 881 MWe
- Once through cooling from Lake Ontario
- Staff Complement: approximately 650



# JAFNPP Plant Status

- Startup from RFO 17 - November 4, 2006
- Current Plant Status
- Next outage Sept 2008





# Licensing History

Construction Permit

May 20, 1970

Operating License

October 17, 1974

Commercial Operation

July 28, 1975

Upgraded Power License (4%)

December 6, 1996

License Transfer to Entergy

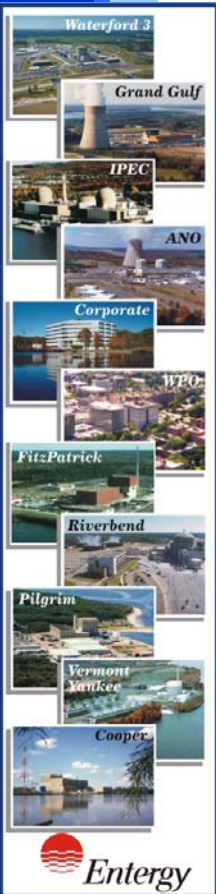
November 21, 2000

LR Application Submitted

July 31, 2006

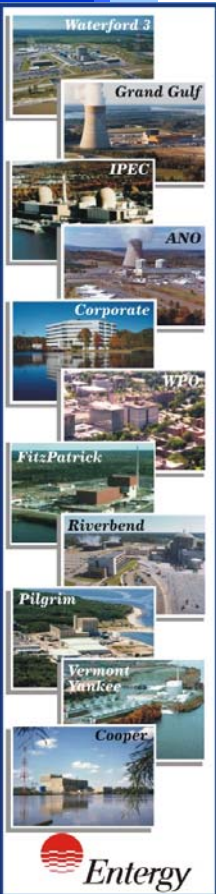
Operating License Expires

October 17, 2014



# Major Improvements

|                  |   |
|------------------|---|
| <b>1978-1983</b> | <b>Mark I Containment Modifications</b>     |
| <b>1988</b>      | <b>Hydrogen Water Chemistry</b>             |
| <b>1989</b>      | <b>Zinc Injection</b>                       |
| <b>1990</b>      | <b>Power Uprate Equipment Upgrades</b>      |
| <b>1998</b>      | <b>ECCS Suction Strainers Replaced</b>      |
| <b>1999</b>      | <b>Noble Metals Application</b>             |
| <b>2004</b>      | <b>LP Turbine Rotor Replacement</b>         |
| <b>2004</b>      | <b>Noble Metals Application 2</b>           |
| <b>2006</b>      | <b>HP Turbine Rotor Replacement</b>         |
| <b>2006</b>      | <b>Offgas Condenser Replacement</b>         |
| <b>2006</b>      | <b>HPCI Discharge Exhaust Sparger Added</b> |

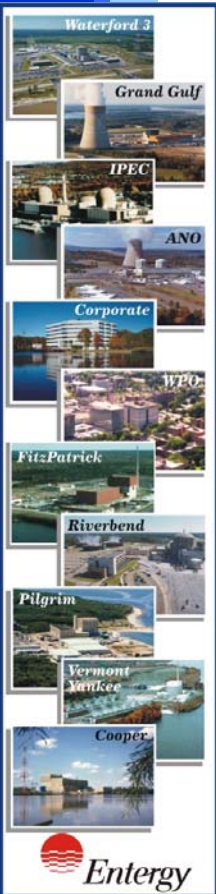


# Future Improvements

2008 Main Transformer Replacement

2008 Core Spray Motor Replacement

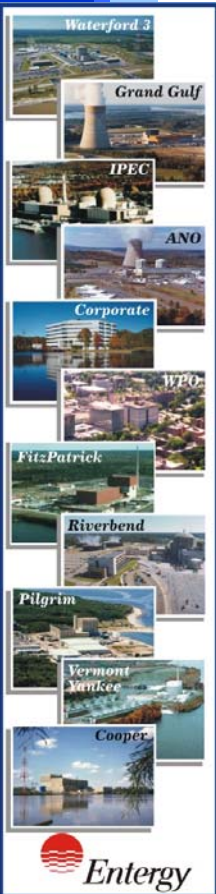
2008 345KV Breaker Replacement





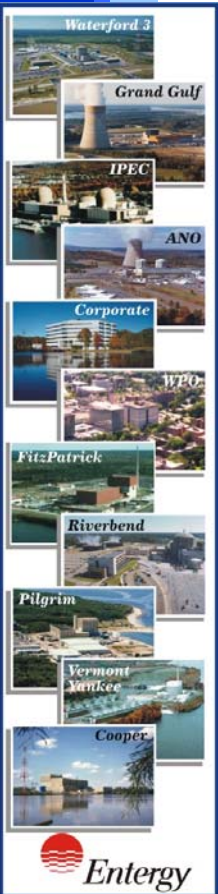
# JAFNPP License Renewal Project

- LRA Prepared by experienced, multi-discipline Entergy team (utilized corporate and on-site resources)
- Incorporated lessons learned from previous applications
- Peer review conducted
- LRA internal reviews (Safety Review Committees and QA)
- All comments resolved prior to submittal



# JAFNPP License Renewal Project

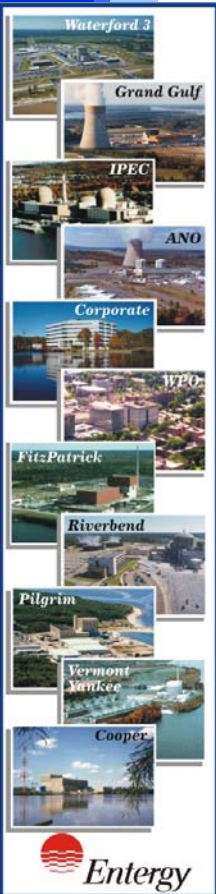
- License Renewal Commitments
  - Refined during audit/inspection process
  - Tracked by Entergy commitment tracking and engineering work tracking systems
- 36 Aging Management Programs
  - 17 Programs in Place w/o Enhancements
  - 9 Programs will be Enhanced
  - 10 New Programs
- GALL Consistency
  - 10 Consistent
  - 20 Consistent with exceptions / enhancements
  - 6 Plant Specific



# JAFNPP License Renewal Project

## ***Program Implementation Plan***

- Develop fleet approach for Entergy plants that have submitted an LRA
- Develop schedule using industry experience

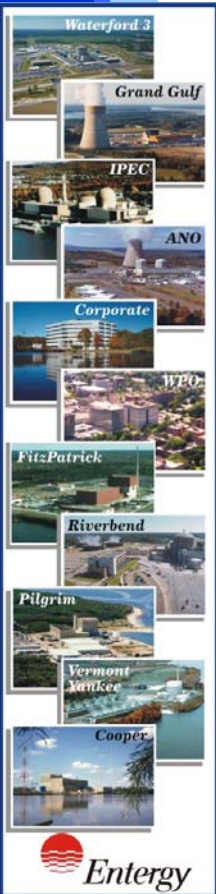


# JAFNPP License Renewal Project

## Scoping of Non safety-Related Systems, Structures, and Components

(10 CFR 54.4a(2))

- Utilized site component database, P&IDs, and isometric drawings
- Reviewed safety related cable / piping locations
- Performed walkdowns for a(2) scope verification

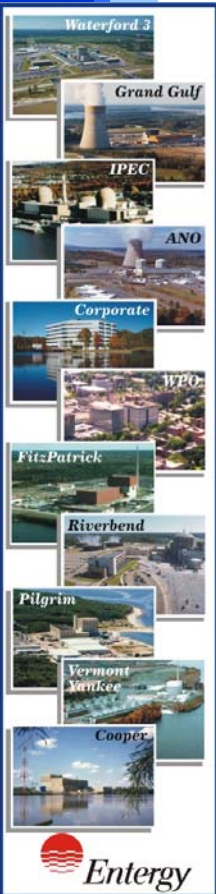


# JAFNPP License Renewal Project

## Scoping of Non safety-Related Systems, Structures, and Components

(10 CFR 54.4a(2))

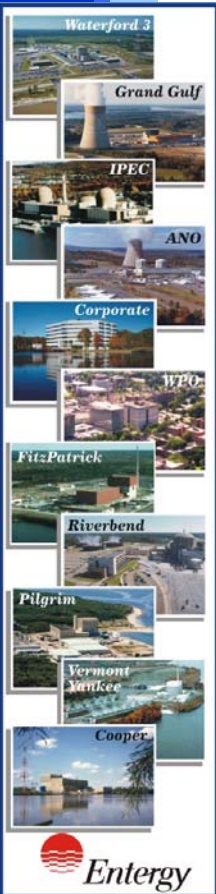
- Regional Inspection verified a(2) scoping for in-plant areas and systems
- 10 CFR 54.4a(2) scope changes made in LRA Amendment 11
- Regional Inspection concluded that JAF had implemented an acceptable method of scoping and screening of non-safety related SSCs and that this method resulted in accurate scoping determinations



# JAFNPP License Renewal Project

## ***Draft SER Summary***

- Open Items – 2
  - Reactor Vessel Fluence
  - Environmentally Assisted Fatigue
- Confirmatory Items – None

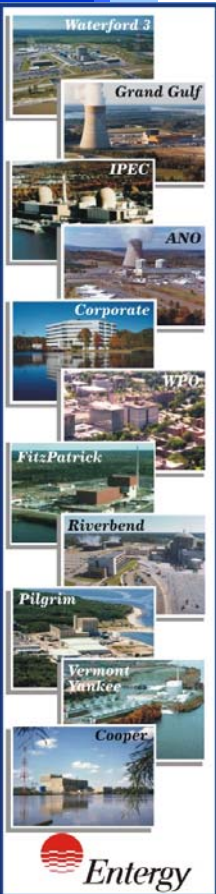




# JAFNPP License Renewal Project

## Reactor Vessel Neutron Fluence

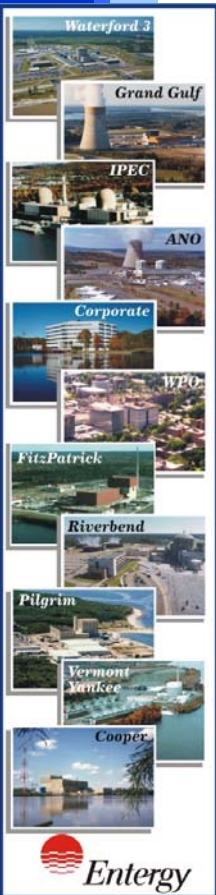
- Current P-T curves valid through 2014 (32EFPY)
- Submit RG 1.190 calculations by September 2007
- Evaluated TLAAAs to determine limiting fluence (RG 1.99)
  - Adjusted Reference Temperatures (<200F)
  - Upper Shelf Energy (>50 ft-lb)
  - RPV welds
  - RPV nozzles near beltline
- Axial Weld Failure Probability is limiting at  $5 \times 10^{-6}$  per Reactor Year
- ART and USE values will not be challenged at 54 EFPY



# JAFNPP License Renewal Project

## Environmentally Assisted Fatigue

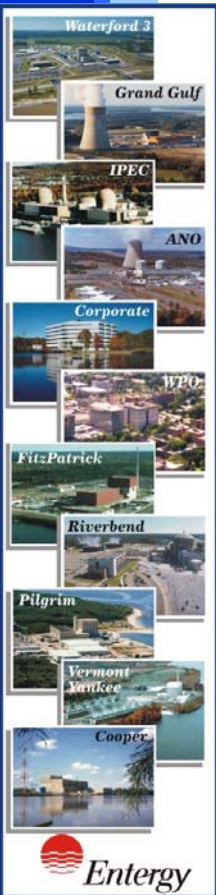
- JAF will demonstrate that cumulative usage factors (CUF) of the most fatigue sensitive locations are less than 1.0 throughout the license renewal period by first using Option (1) of commitment #20
- Analysis methods for determination of stresses and fatigue usage will be in accordance with NRC endorsed ASME Boiler and Pressure Vessel Code
- JAF will utilize design transient specifications and information from BWR-4 references to bound operational transients



# JAFNPP License Renewal Project

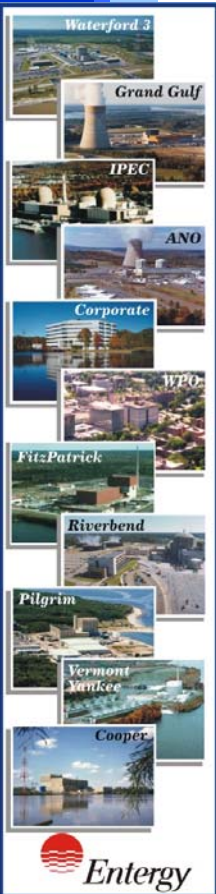
## Environmentally Assisted Fatigue

- Environmental effects on fatigue usage will be assessed consistent with the Generic Aging Lessons Learned Report, NUREG-1801, Rev. 1.
- If Option (2) becomes necessary, plant inspection program will be described in terms of the ten elements specified in Branch Technical Position RLSB-1.
- If Option (3) becomes necessary, repair or replacement will be in accordance with plant procedures that meet ASME Section XI requirements.
- Above actions will be incorporated into the Fatigue Monitoring Program.
- The Fatigue Monitoring Program will manage the effects of EAF in accordance with 10 CFR 54.21(c)(1)(iii).



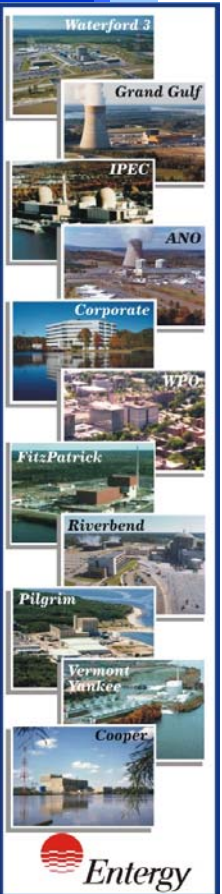
# Cost-Beneficial SAMAs

- Six Potentially Cost-Beneficial SAMAs Identified
- No Age-Related SAMAs
- Implementation will be evaluated using the plant cost-benefit analysis process

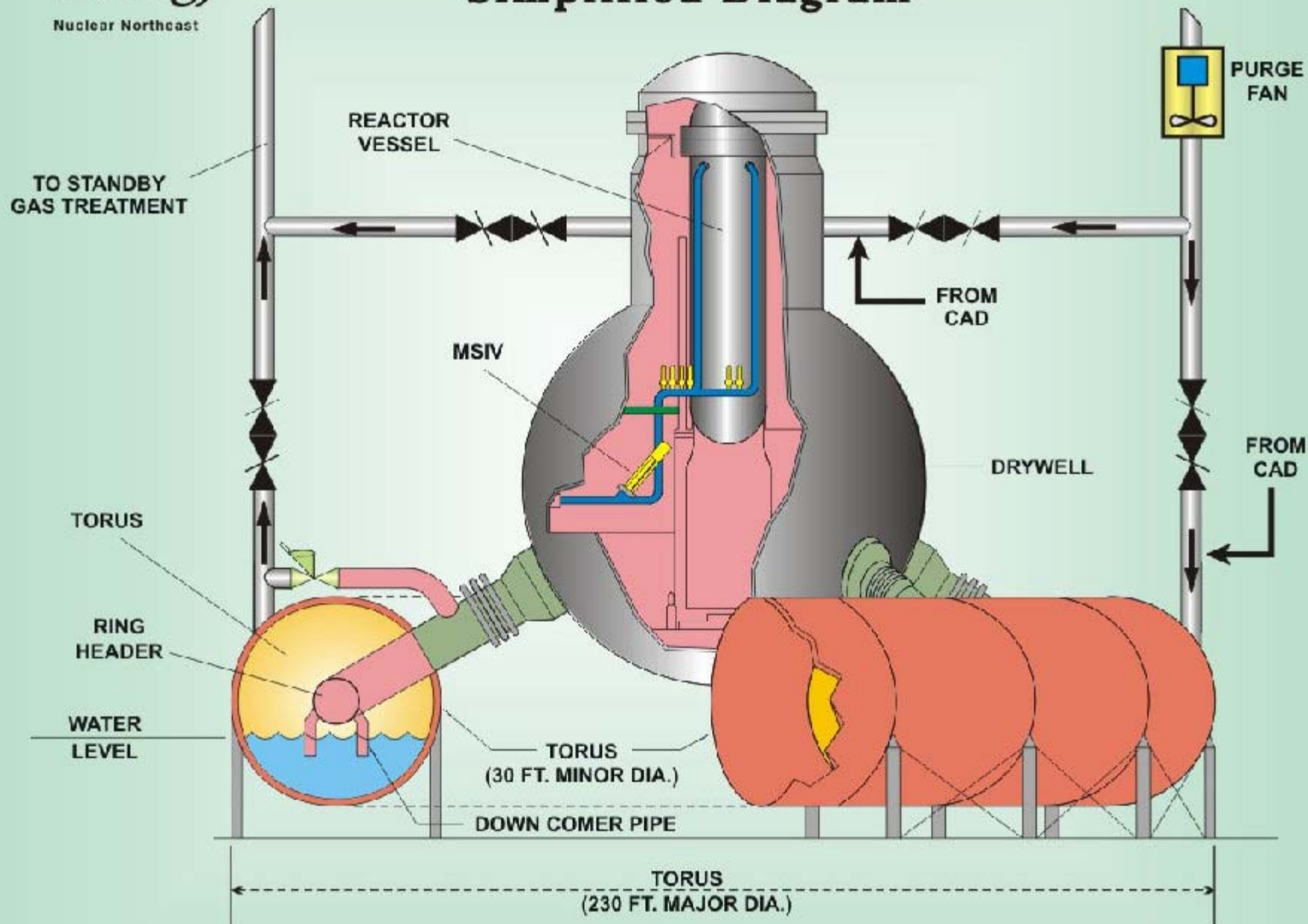


# Presentation Topics

- Drywell and Torus Monitoring
- Torus Repair

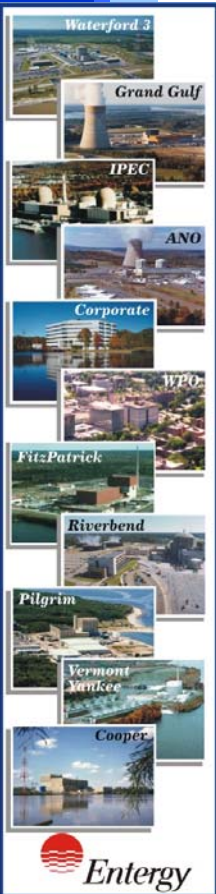


# Primary Containment System Simplified Diagram

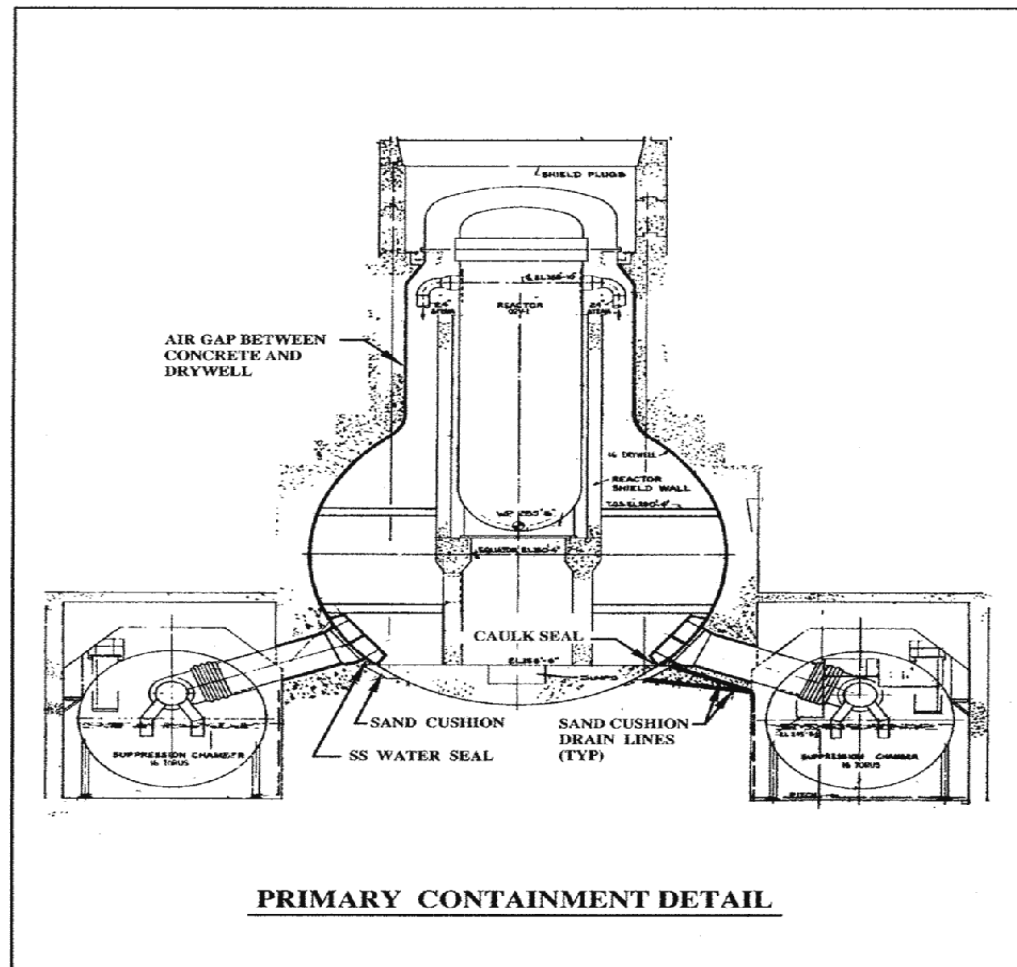
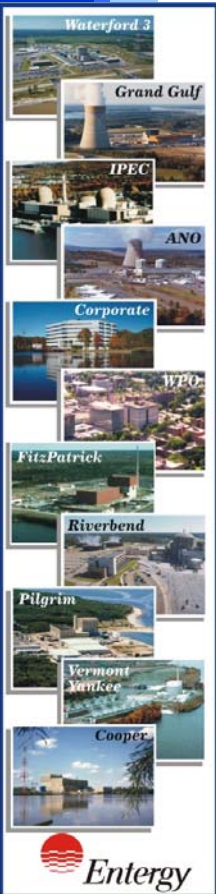




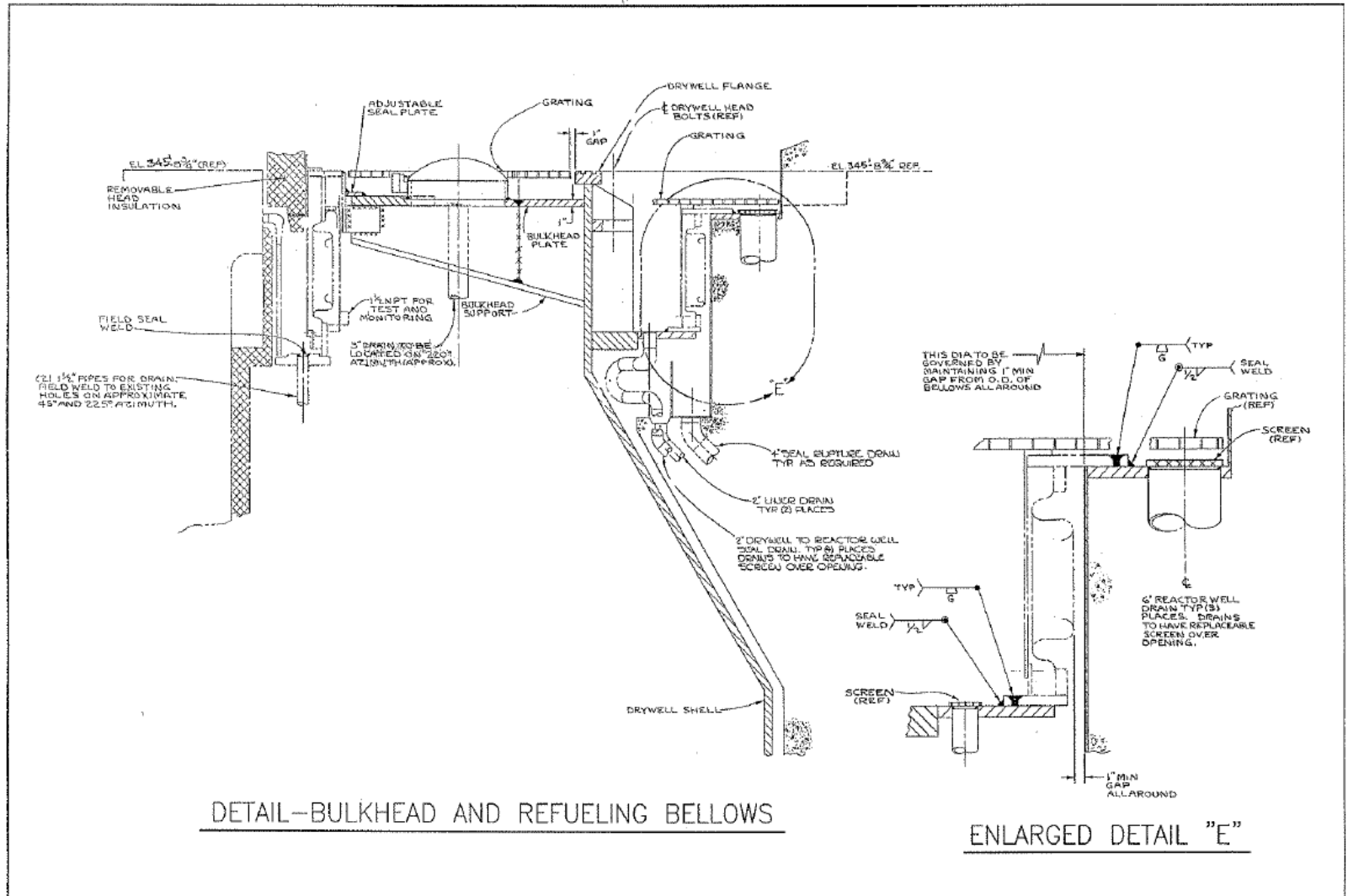
# Drywell and Torus Monitoring



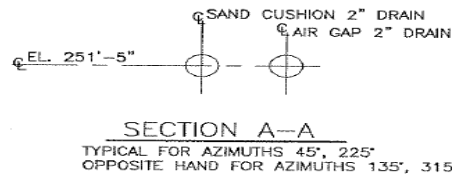
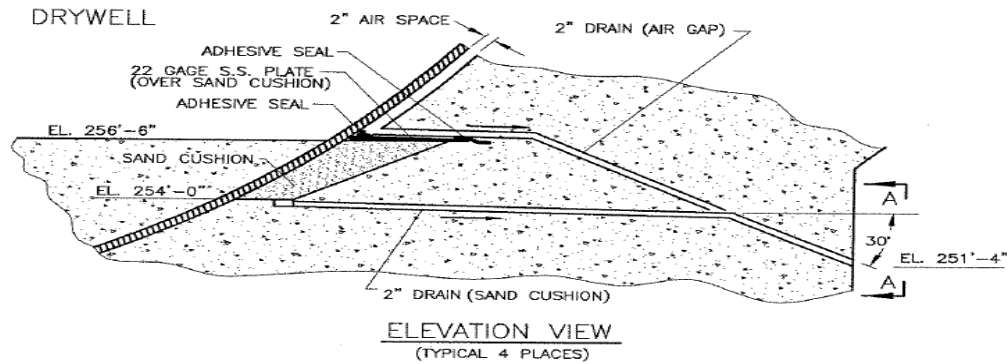
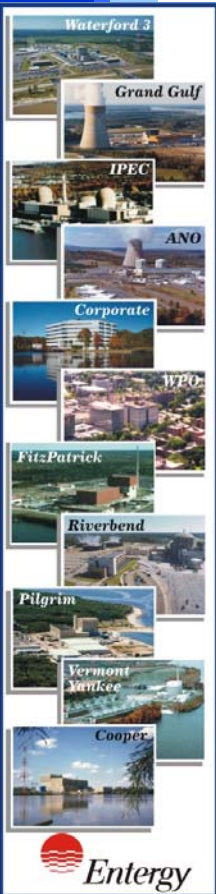
# James A. FitzPatrick



# James A. FitzPatrick



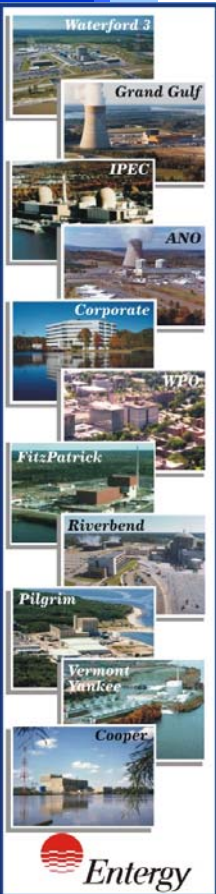
# James A. FitzPatrick



**SAND CUSHION & AIR GAP DRAIN LINE DETAILS**

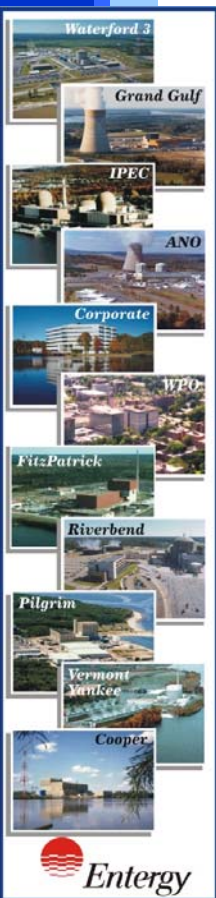
# Drywell Monitoring

- Sand Cushion Inspections. No Evidence of Moisture (Boroscopic Inspection).
- Visual Inspection of Interior Drywell Caulk Seal.
- Drywell Interior Coating System (Carbozinc 11 and Dupont Corlar Epoxy) Inspection IAW IWE Program during RFO.



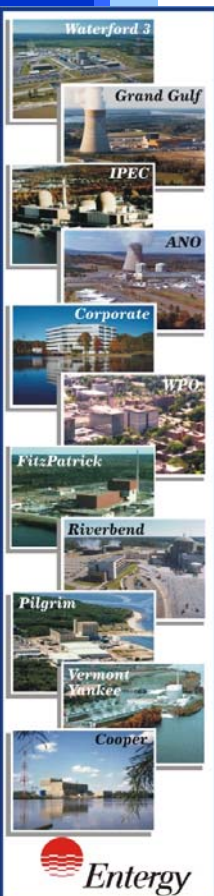
# ***Torus Monitoring***

- Torus Interior Shell Inspection 1998 (Installation of ECCS Suction Strainers).
- Torus Interior Coating System (Carbozinc 11) inspected.
- Torus Interior/Exterior Inspected IAW JAF IWE Program.



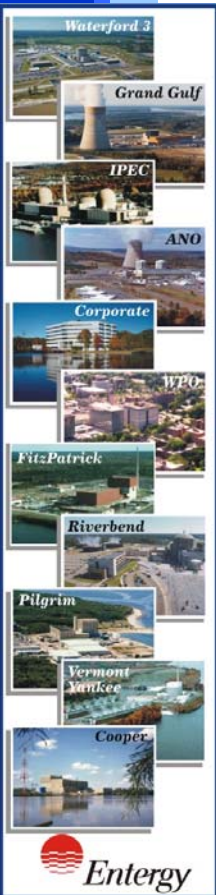


# Drywell Shell Construction Photo

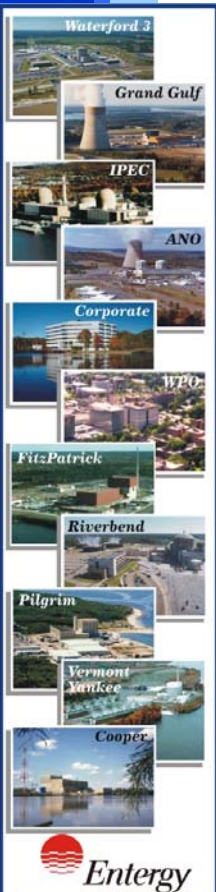




# Drywell Shell Construction Photo

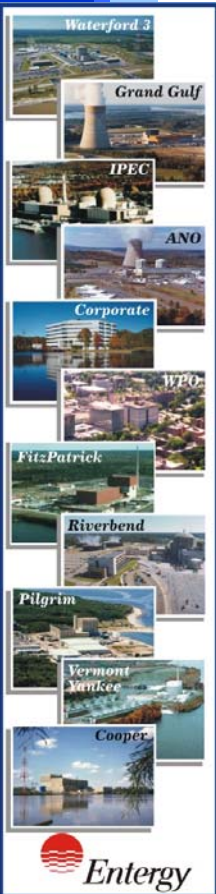
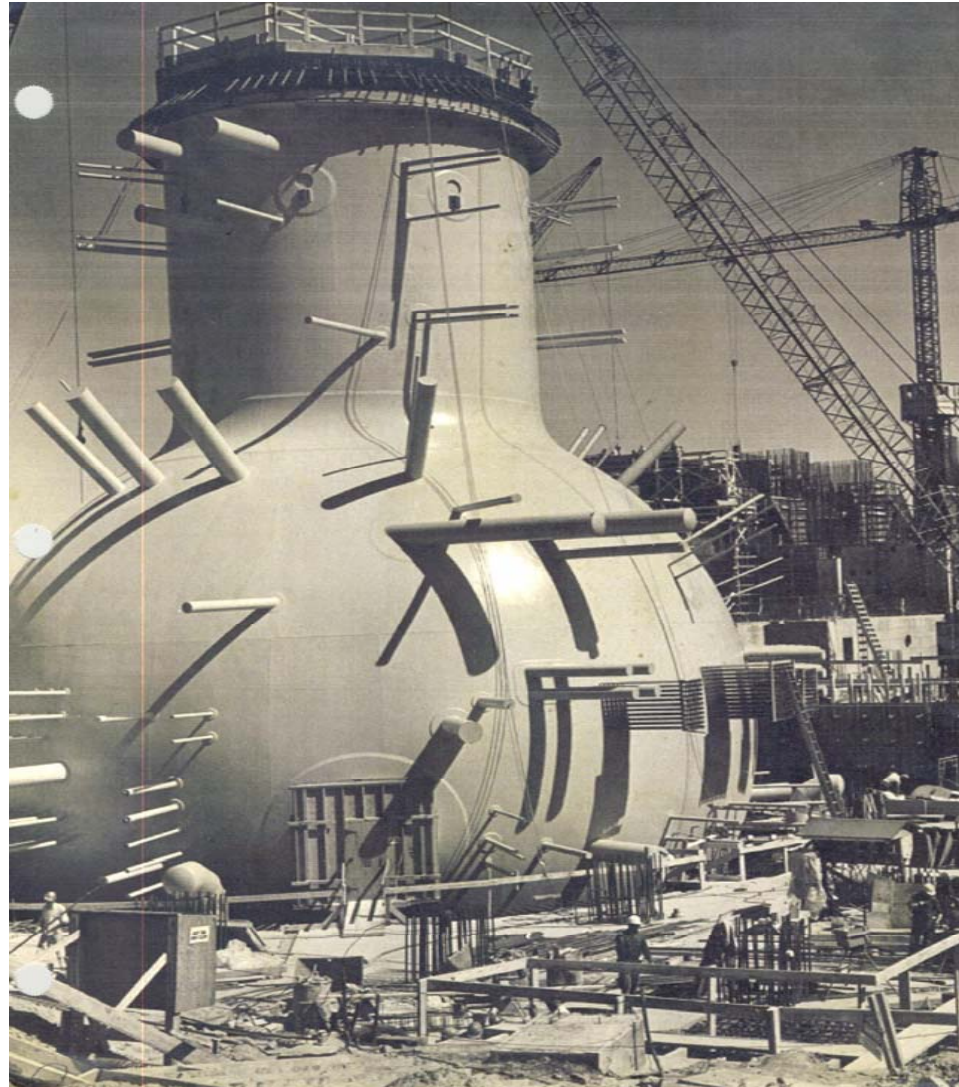


# Drywell Shell Construction Photo

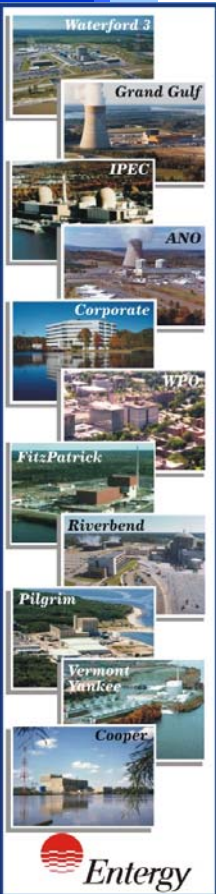




# Drywell Shell Construction Photo



## Torus Repair

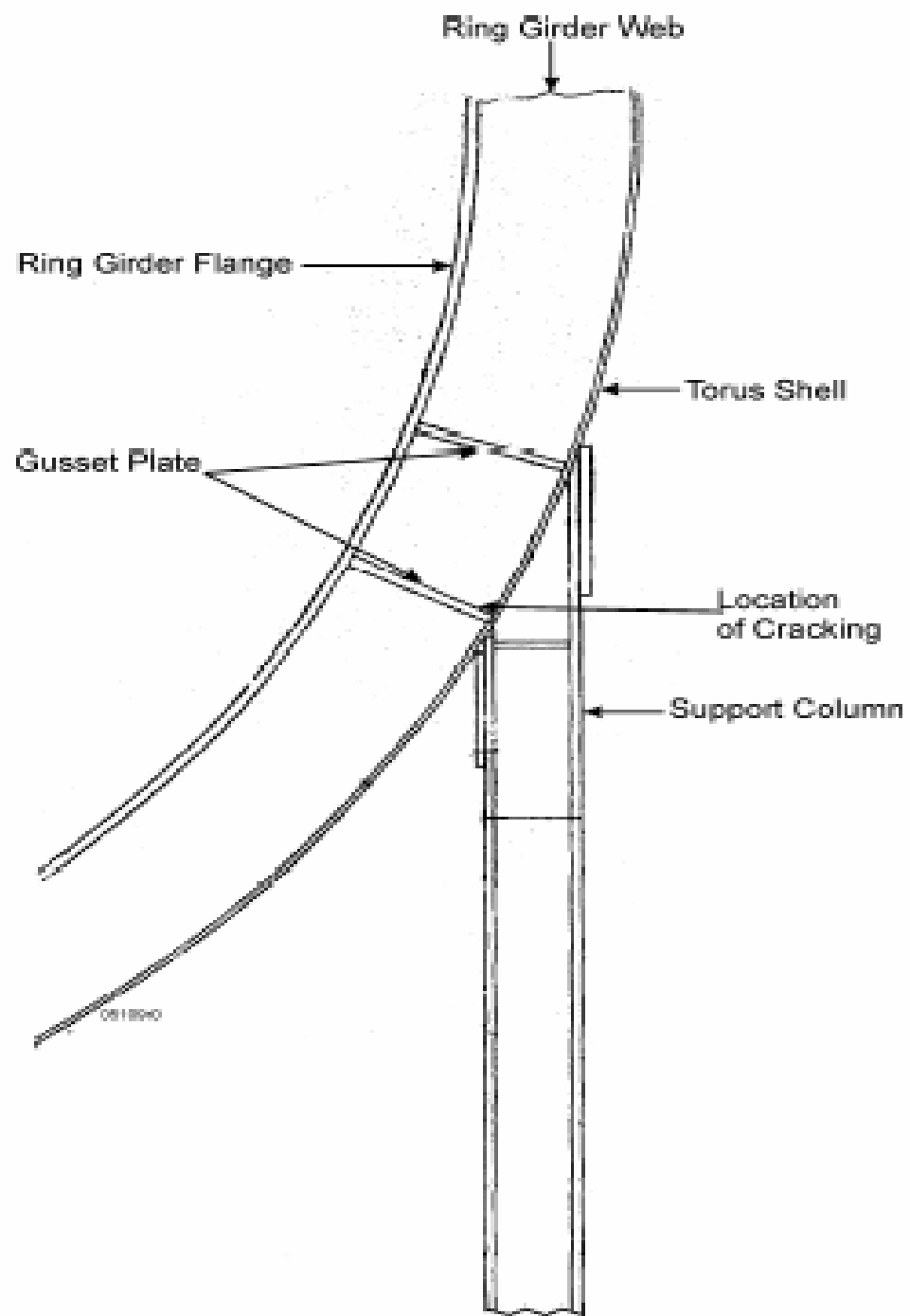


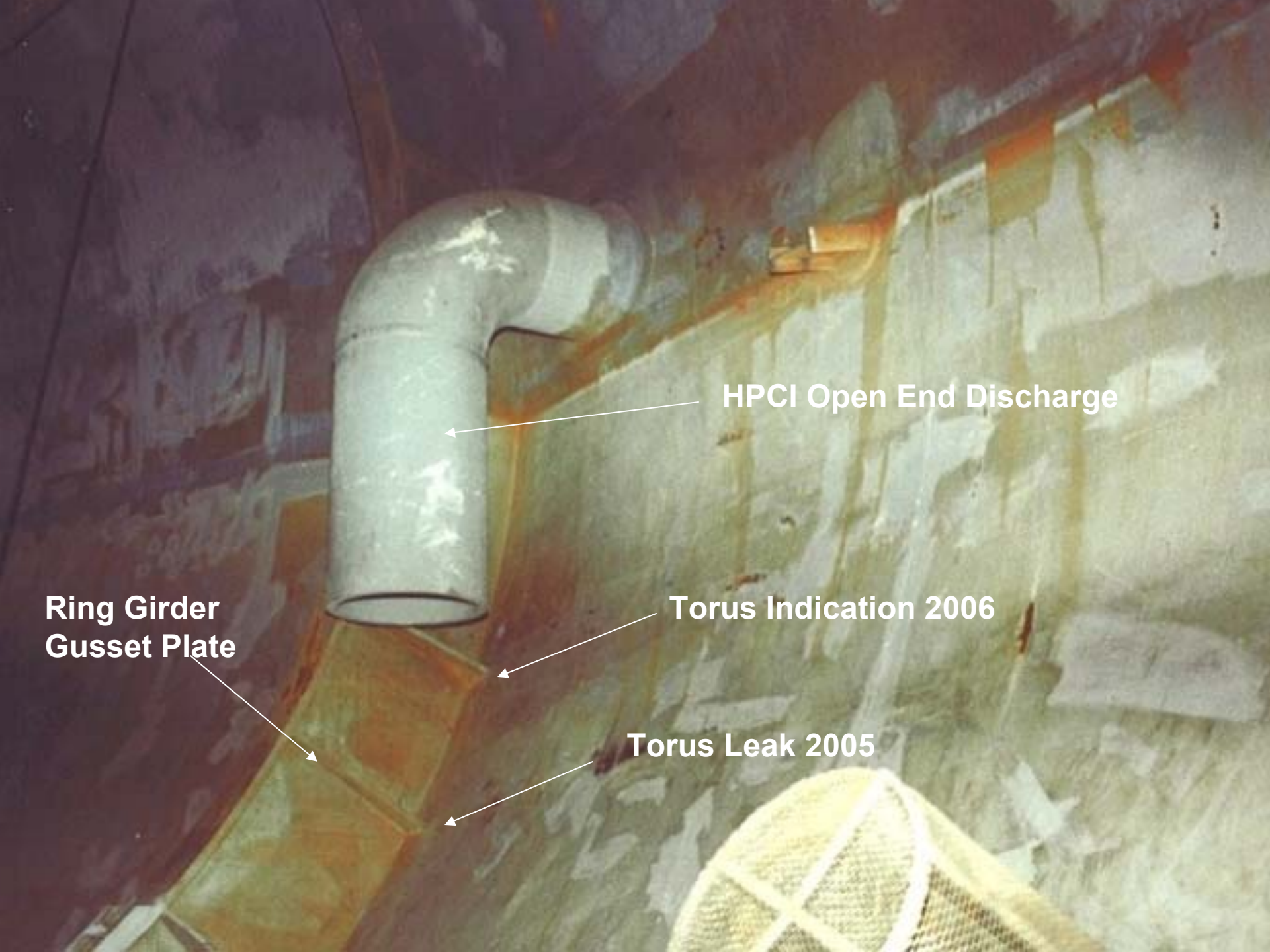
# ***Torus Repair***

- Torus shell through-wall leak reported in June 2005
- Leak was located in same bay as HPCI Steam Discharge pipe near ring girder gusset plate weld
- ASME Section XI code repair performed in July 2005 by removing the flaw and adding a circular repair plate
- Root cause of flaw was vibration fatigue from HPCI steam condensation oscillation loading









HPCI Open End Discharge

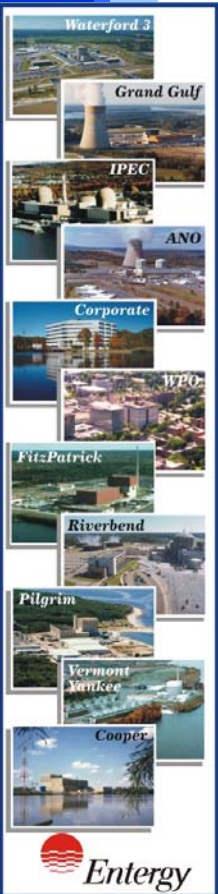
Ring Girder  
Gusset Plate

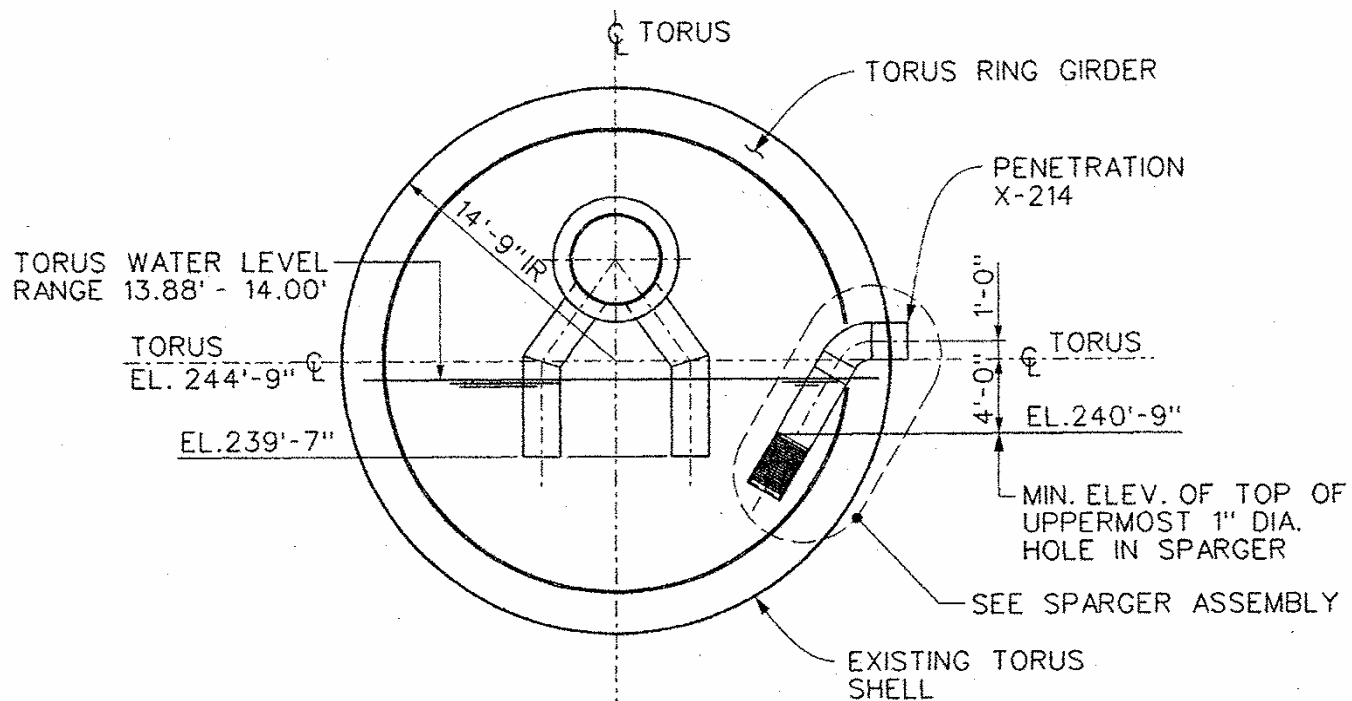
Torus Indication 2006

Torus Leak 2005

# ***Torus Repair***

- A HPCI Steam Exhaust Sparger assembly was added during refueling outage October 2006
- The sparger directs steam flow away from the Torus shell
- The sparger significantly reduces loads on the Torus shell from HPCI Steam condensation oscillation



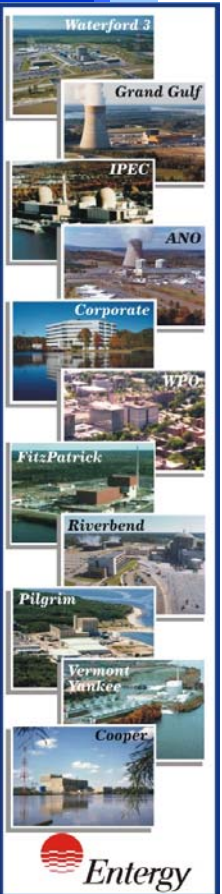


ELEVATION LOOKING EAST @ 270° AZIMUTH

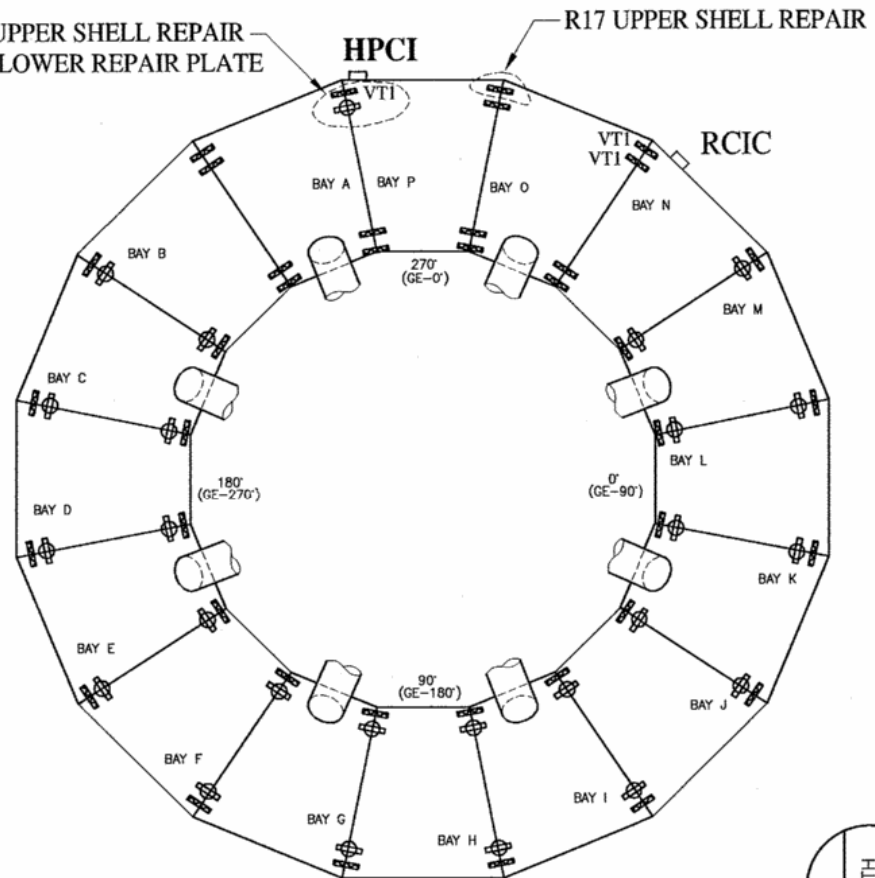
SCALE: 1/8" = 1'-0"

# ***Torus Repair***

- Extent of condition actions from Root Cause required additional shell exams during refueling outage October 2006
- ASME visual exams of similar ring girder gusset welds performed at HPCI and RCIC steam discharge locations
- General visual exams of similar ring girder gusset welds performed at several locations throughout the Torus
- Exam results reported shell base metal flaws at two additional locations in the HPCI discharge bay



R17 UPPER SHELL REPAIR  
2005 LOWER REPAIR PLATE



**TORUS PLAN VIEW**

LEGEND

|  |             |
|--|-------------|
|  | VISUAL EXAM |
|  | NO EXAM     |





# ***Torus Repair***

- ASME Section XI code repairs were performed by grinding to remove the flaws and welding to restore configuration
- Review was performed to confirm the HPCI steam discharge loading also caused these flaws



# Comments and Questions

