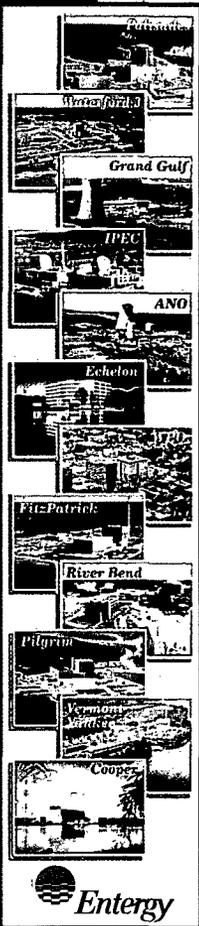


# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping**

- On February 15, 2009 a leak was identified in the Unit 2, 8" condensate storage tank (CST) return line.
- The leak was below the AFW pump room.
- The floor slab was removed and the leaking pipe was excavated.
- The section of pipe with the leak was replaced and the line was returned to service.



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# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping**

### **Aging Management Program**

- As described in the LRA, the IPEC buried piping inspection program is a new program that must be implemented prior to the PEO.
- The foundational elements of the program are being implemented in accordance with an Entergy fleet procedure for buried piping program.
- The program includes all site buried piping including piping in systems that are in the scope of license renewal.
- The program requires consideration of industry and site operating experience during implementation.

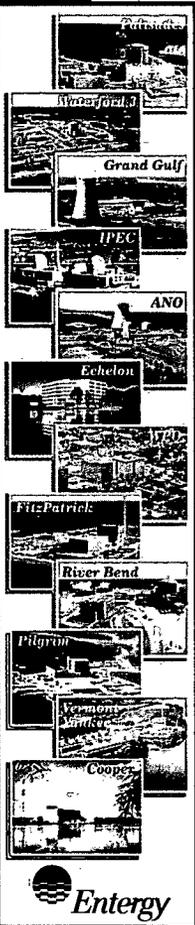


# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping**

### **Previous Inspections**

- In the Fall of 2008, three IP2 CST pipes were exposed at two locations for approximately 10' of each piping run.
- An upper location was excavated close to the CST and a lower location was excavated approximately 100' down the hill.
- The three inspected lines were:
  - (a) 12" line – AFW supply
  - (b) 8" line – CST return
  - (c) 10" line – CST overflow

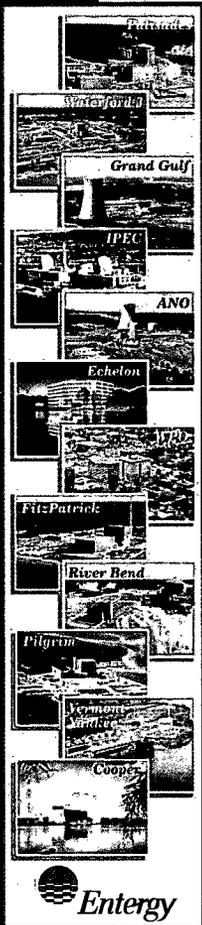


# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping**

### **Previous Inspections**

- The inspection of the upper location identified five areas which required coating repairs.
- The inspection of the lower location identified the need for two minor coating repairs on the 8" and 10" lines.
- UT measurements performed on the exposed sections showed that pipe thickness remains at nominal thickness.

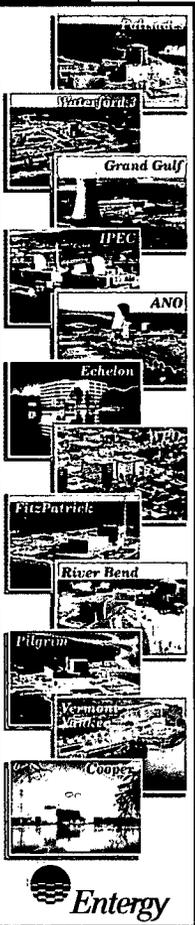


# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping**

Cause of the leak

- A failure analysis indicated that the leak in the CST return line was caused by external corrosion.
- The corrosion occurred at localized areas of coating damage.

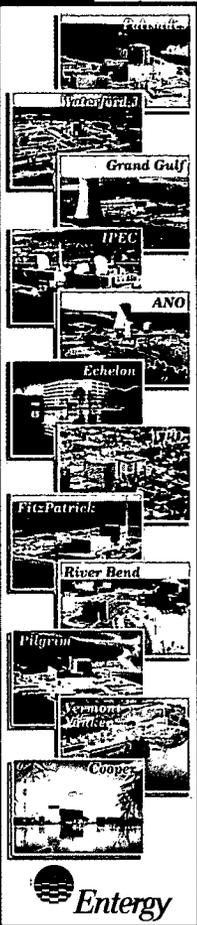


# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping**

### Contributing Causes

- The localized failure of the protective coating was caused by rocks introduced during original plant construction.
- The localized corrosion was exacerbated by the slow soil drainage which results in intermittent submergence of the piping at lower site elevations due to rainfall.

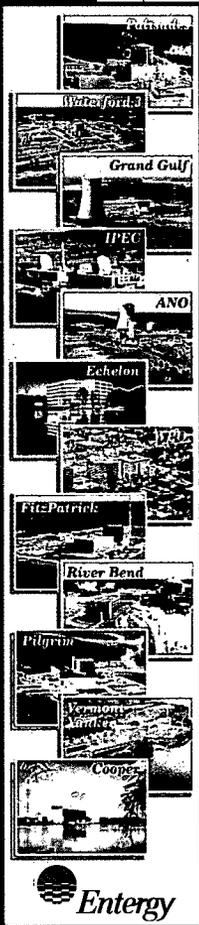


# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping**

### **Corrective Actions**

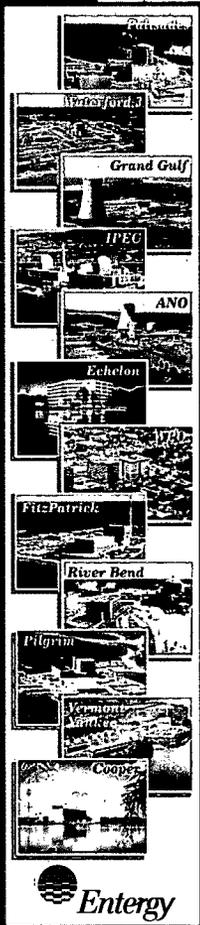
- In response to the leak, six additional locations have been selected for inspection. These include both Unit 2 and Unit 3 piping.
- The selected locations include CST and service water piping in locations with similar drainage conditions.
- Guided wave ultrasonics is the NDE method selected for this inspection.
- Additional inspections or testing will be implemented as appropriate based on the inspection results.
- The inspections will be completed by October 2009.



# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping Industry Operating Experience**

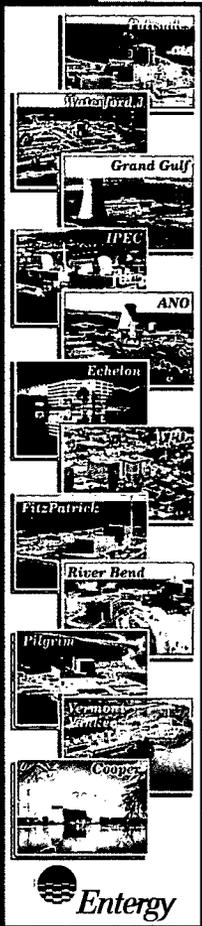
- A search of industry operating experience was performed for this event using the INPO web.
- Industry OE from this search was noted and the information was considered during the evaluation of this event.



# ***Buried Piping Inspection Program***

## **IP2 CST Return Line Piping Conclusion**

- There was no safety impact as a result of the leaking CST pipe.
- The affected pipe remained within the ASME XI structural requirements and remained operable.
- Multiple barriers remained in place to ensure that the minimum required CST inventory was maintained.
- Monitoring confirmed that the CST level did not drop below the required level as a result of this leak.



# Buried Piping Inspection Program

## Program Improvements

- LRA commitment was to the GALL program, which entailed a limited number of inspections.
- The enhanced program will include multiple inspections of buried piping both prior to and during the PEO.
- The IPEC program requires that piping segments be classified as high, medium, or low safety significance.
- Under the program schedule provisions, High impact piping segments will be inspected during the current license period.

