



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 9, 2000

MEMORANDUM TO: Marsha Gamberoni, Acting Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

FROM: Jefferey F. Harold, Project Manager, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF MARCH 1, 2000, MEETING WITH CONSOLIDATED  
EDISON COMPANY OF NEW YORK, INC. TO DISCUSS STEAM  
GENERATOR TUBE INSPECTION PROGRAM (TAC NO. MA8219)

On March 1, 2000, a public meeting was held at the Consolidated Edison Education Center Auditorium, between Consolidated Edison (Con Ed), and the Nuclear Regulatory Commission (NRC) staff. The purpose of the meeting was to discuss matters related to the Indian Point Nuclear Generating Unit No. 2's (IP2) steam generators. Specifically, the steam generator inspection and testing program, nuclear industry standard for steam generators, onsite replacement steam generators, and post inspection findings and restart criterion. Enclosure 1 is the list of attendees. Enclosure 2 contains the slides from the meeting.

The meeting was in two parts. The first half of the meeting was a technical presentation by Con Ed to the NRC which was open for public observation. The second half was a question and answer session between representatives from the NRC and members of the public.

During the technical presentation, Con Ed provided an overview of the IP2 plant design and a description of the steam generators. IP2 has Westinghouse model 44 steam generators. They are the only plant with this model of steam generators in operation. Con Ed attributed their ability to continue to operate the steam generators to their inspection program, maintaining a reduced operating temperature and controlling secondary side water chemistry. The inspection conducted during the 1997 refueling outage was performed on 100% of all the steam generator tubes. For the current inspection all tubes will be inspected. The inspection will confirm leak sources(s), examine the tube surfaces, and compare the results to previous inspections for trend purposes. Flaws (cracks and pits) found during the inspection of the tubes will be evaluated and if necessary corrective action will be taken to plug the tube. Currently IP2 has a total of 1,325 of 12,740 tubes plugged or approximately 10.4%. The maximum percent tube plugging is 25%.

Con Ed stated that the tube leak occurred in steam generator 24, location row 2 column 5. The exact root cause of the tube failure was not known, but a root cause evaluation team had been implemented. The results of the root cause would be provided to the NRC upon completion. The NRC informed Con Ed regarding another public meeting that will be scheduled after the NRC staff has reviewed the root cause evaluation. The purpose of the future meeting would

allow Con Ed to present their root cause and corrective actions if any, provide the results of their steam generator inspection, and discuss their readiness for restart.

Enclosures: As stated

cc w/encls: See next page

May 9, 2000

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Official Record Copy

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LIST OF ATTENDEES

MARCH 1, 2000

NRC

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A. Randy Blough, Region I  
Ted Sullivan, NRR  
Emmett Murphy, NRR  
Jefferey Harold, NRR

Consolidated Edison

John Groth  
A. Alan Blind  
James Baumstark  
Jack Perry  
Jimmy Mark  
Robert Masse

# **Indian Point 2 Steam Generators**

**The mission of Indian Point is the safe, environmentally sound, dependable and economic generation of electrical energy utilizing nuclear power... the importance of protecting the health and safety of the public must be understood by employees and be foremost in their conduct of activities.**

**March 1, 2000**

- 
- **Background on Steam Generators**
  - **Inspection Process**
  - **Status of Inspection**
  - **Post Inspection**

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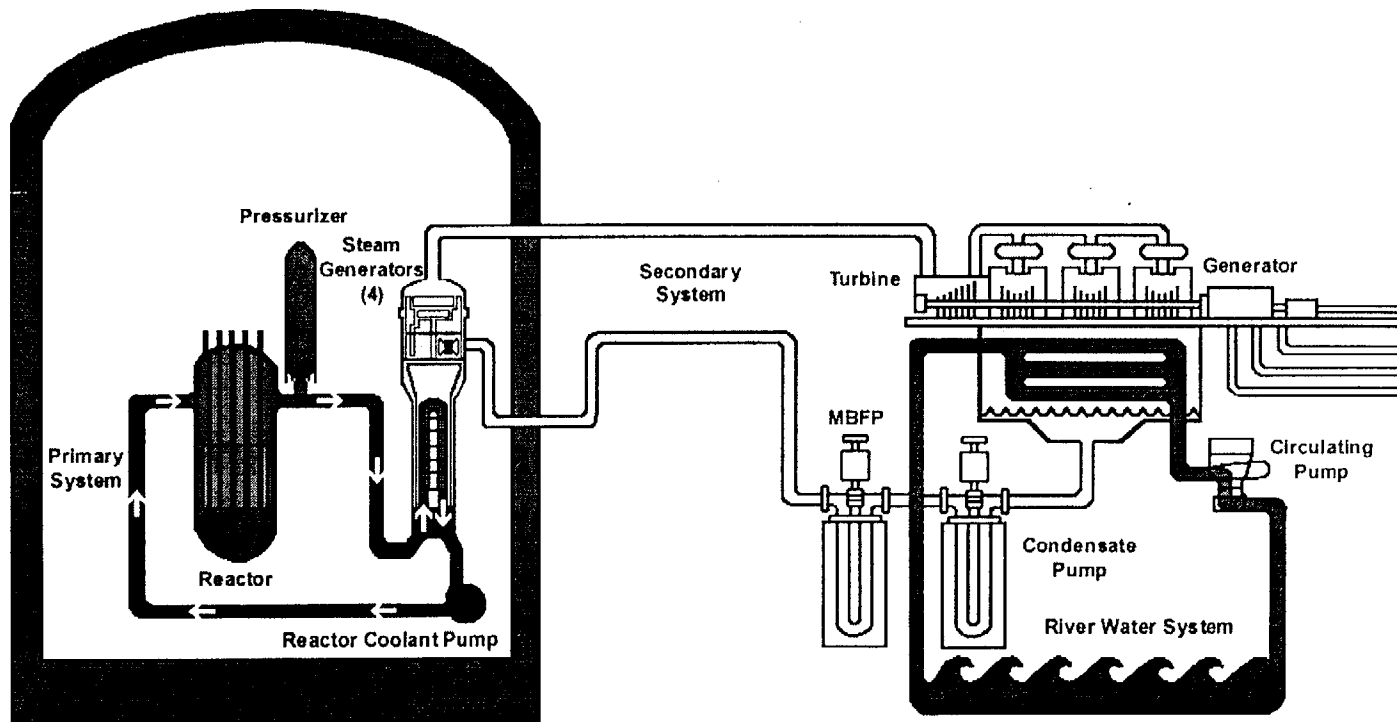


# What Is A Steam Generator ?

It is a Heat Exchanger

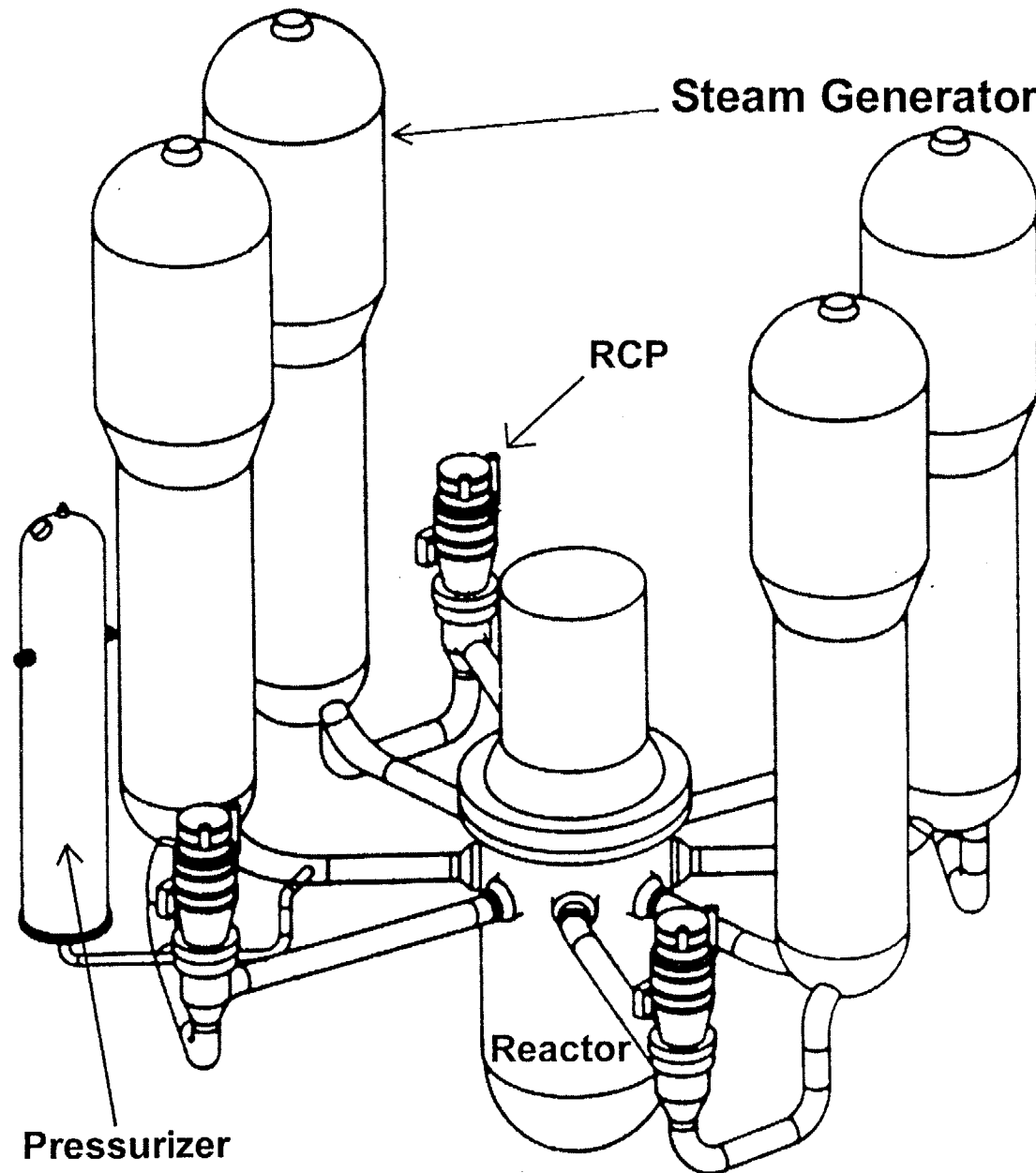
Steam generator tubes are the boundaries between the reactor coolant and the steam going to the turbine

## Indian Point 2

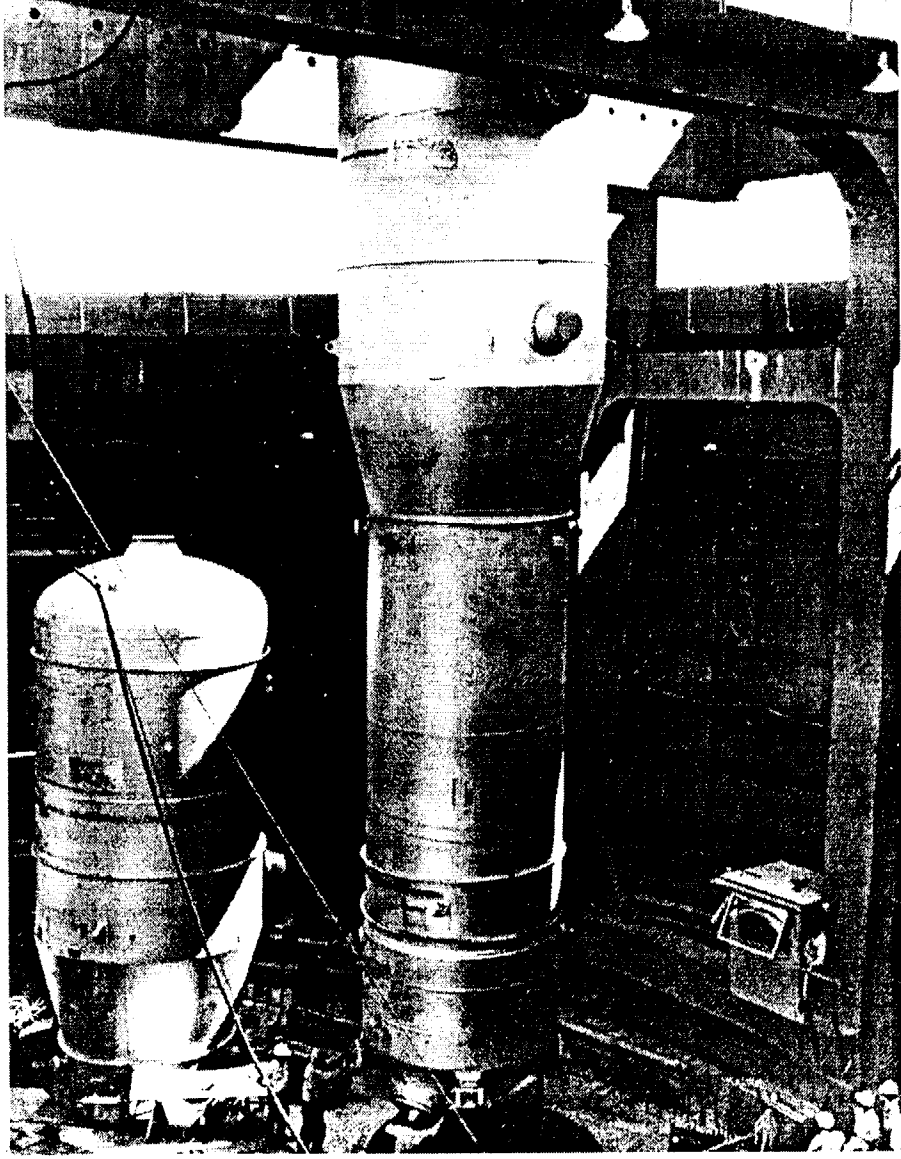
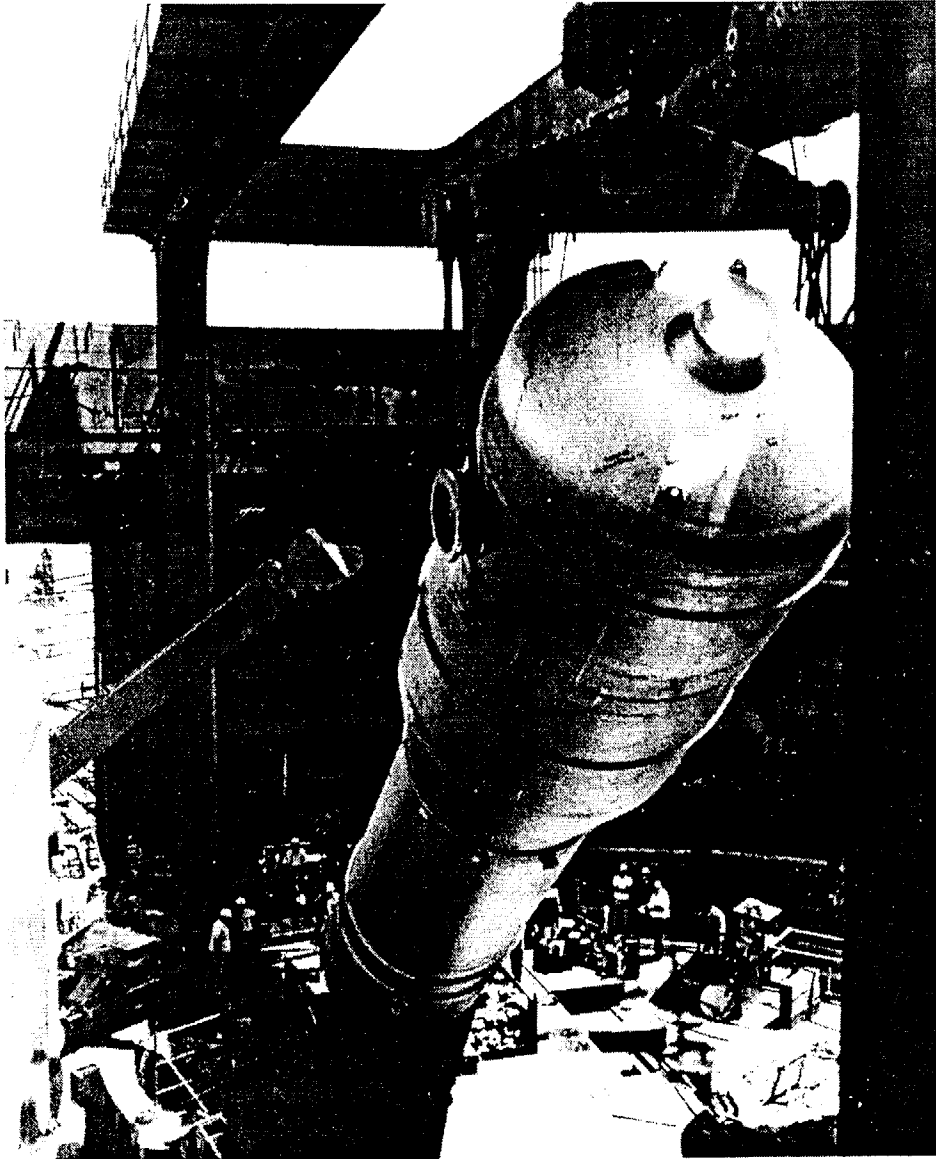


**Containment Building**

# Reactor Coolant System



# Steam Generators During Construction



# **Industry Inspection Standards**

- **Nuclear Energy Institute 97-06**
  - **Industry best practices**
- **Regulatory Requirements**
- **Plant Technical Specifications for inspection & repair**

# **1997 Steam Generator Inspection Program**

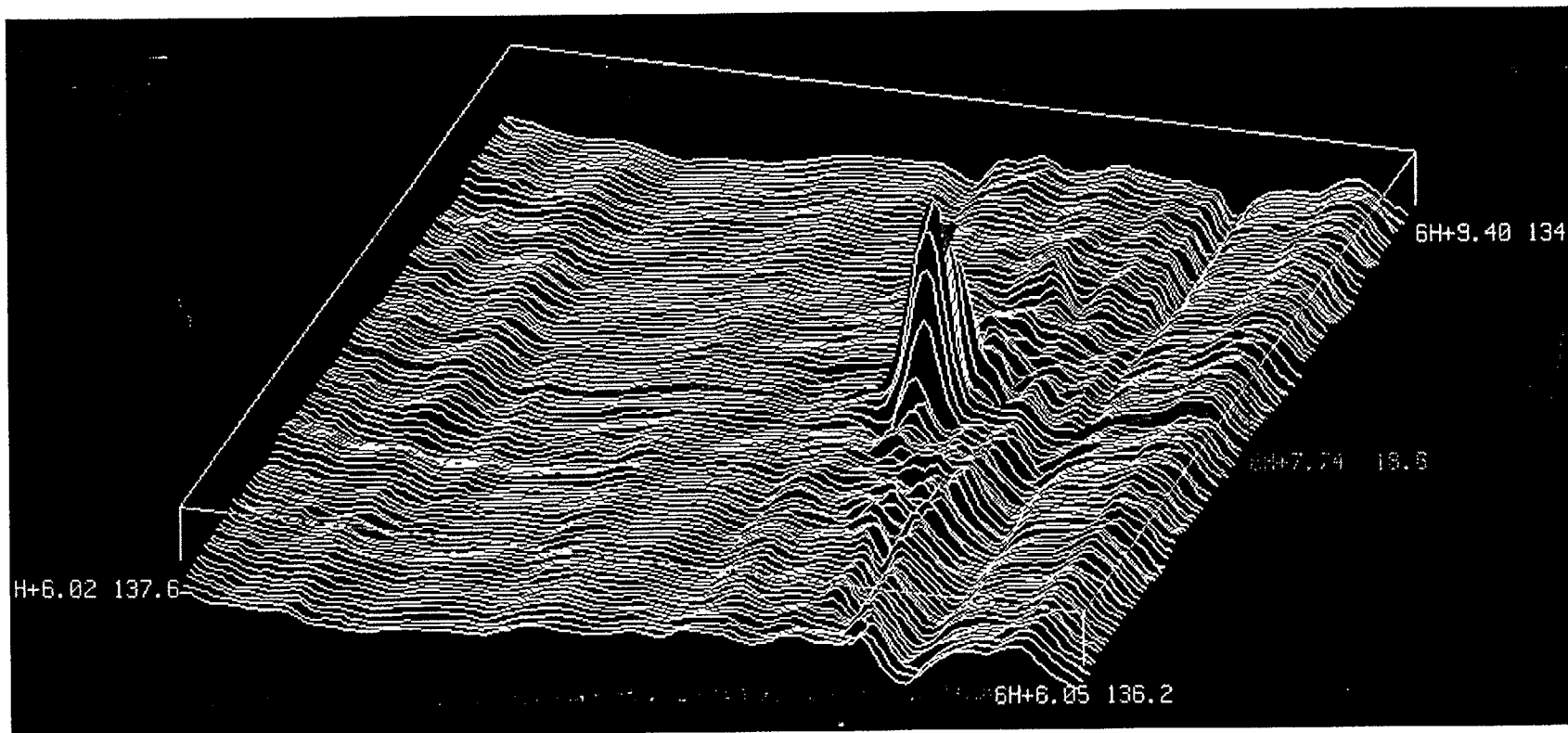
- **Inspection & repairs performed in compliance with industry standards**
- **Performed 100% inspection of steam generator tubes**
- **Met intent of draft NEI 97-06**

# **Current Steam Generator Inspection Program**

- **Inspect every tube in all four steam generators**
  - **Confirm leak source**
  - **Examine tube surfaces**
  - **Compare to previous inspections**
- **Inspect other areas of steam generators**

# How Are Steam Generators Inspected?

- Approved industry standards
- Probe inserted in tube
  - Signal sent from probe
  - Return signals evaluated



# **Data Analysis**

## **Review Process**

- **First Analyst**
- **Second Analyst**
- **Resolution Team**
- **Quality Assurance Program**
- **Third Party Review**



# Tube Disposition

- **Examples of flaws found**
  - Cracks
  - Pits
- **Evaluated against inspection criteria**
- **CORRECTIVE ACTION – plug tube**

# Current Plugging Status

Steam Generator

# of Tubes Plugged

**#21**

**313**

**#22**

**405**

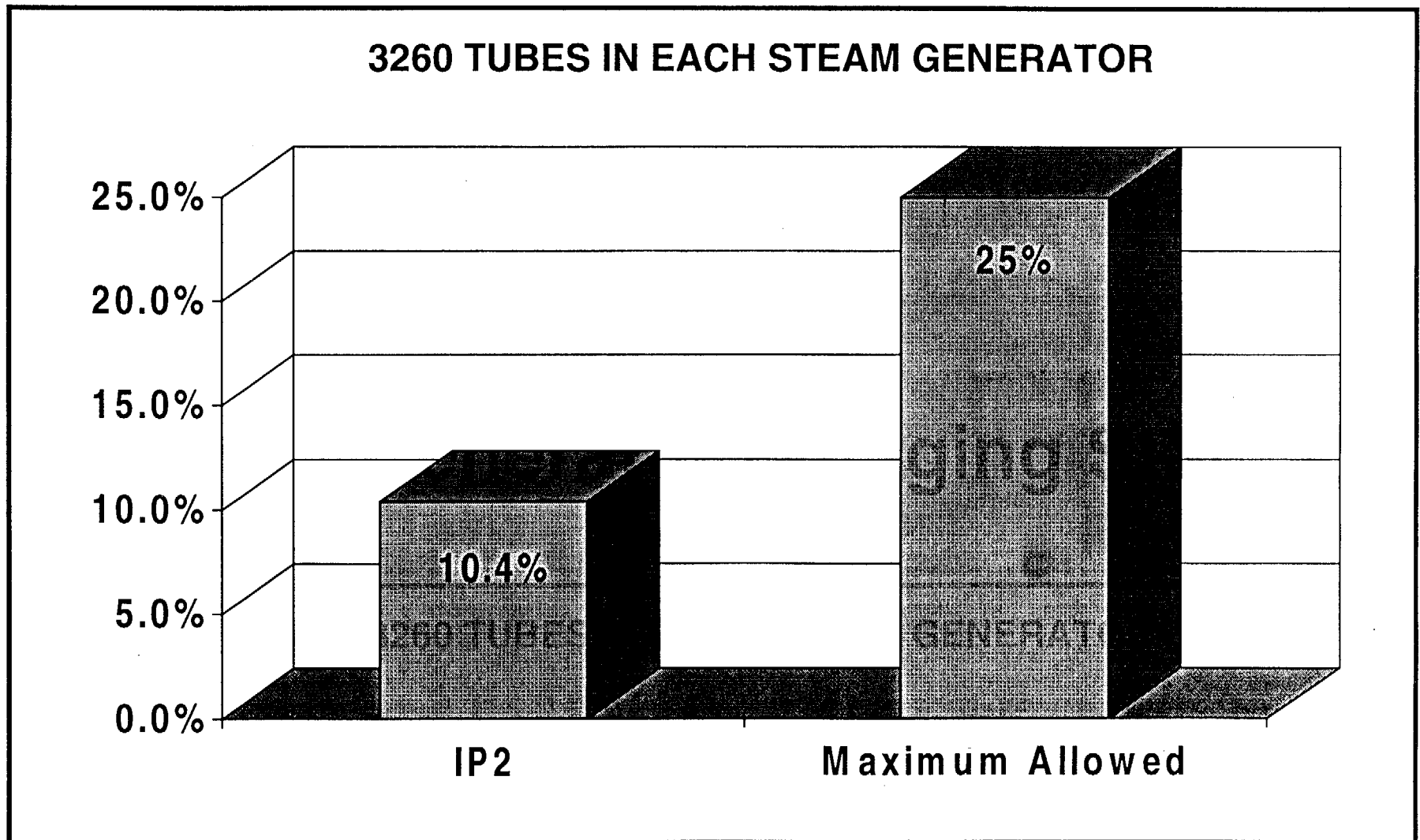
**#23**

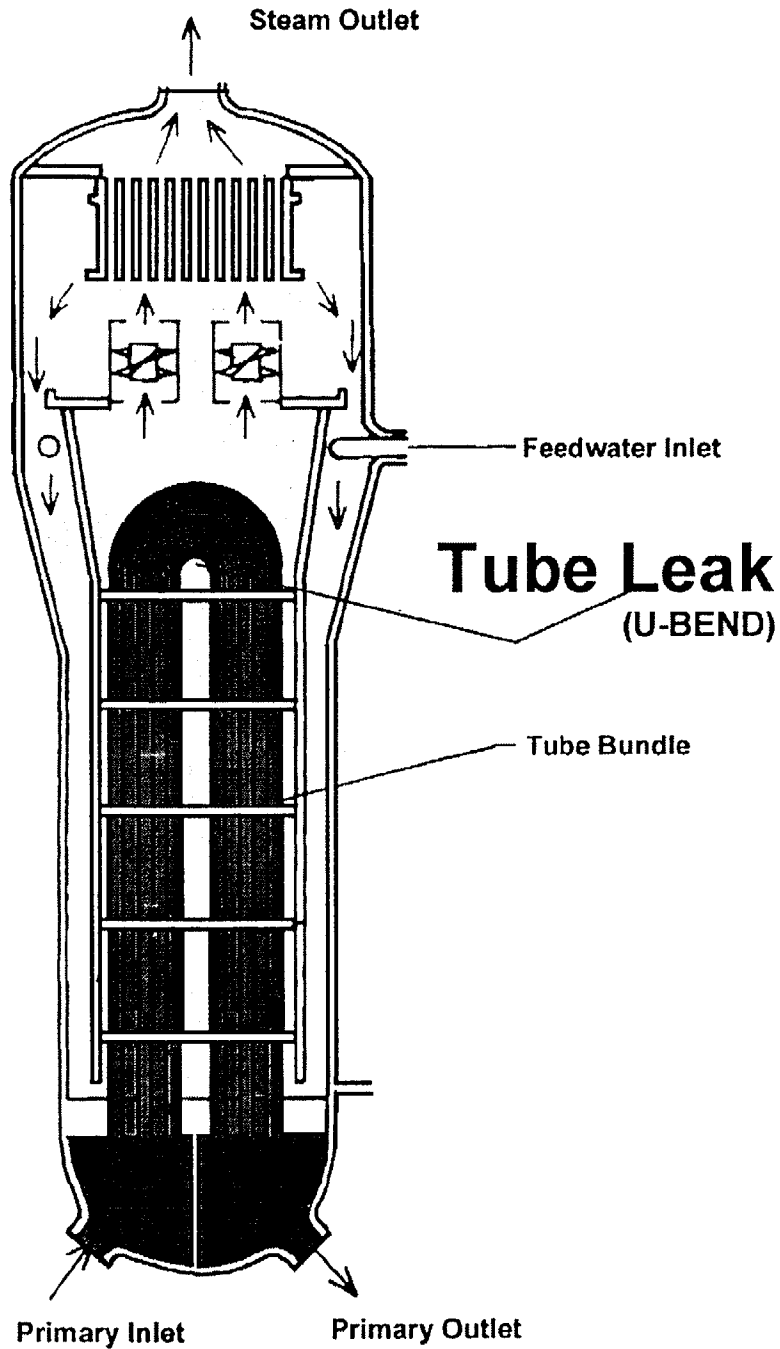
**301**

**#24**

**306**

# Steam Generator Plugging Status





**Where Did the  
Leak Occur ?**

**24 SG  
Row 2  
Column 5**

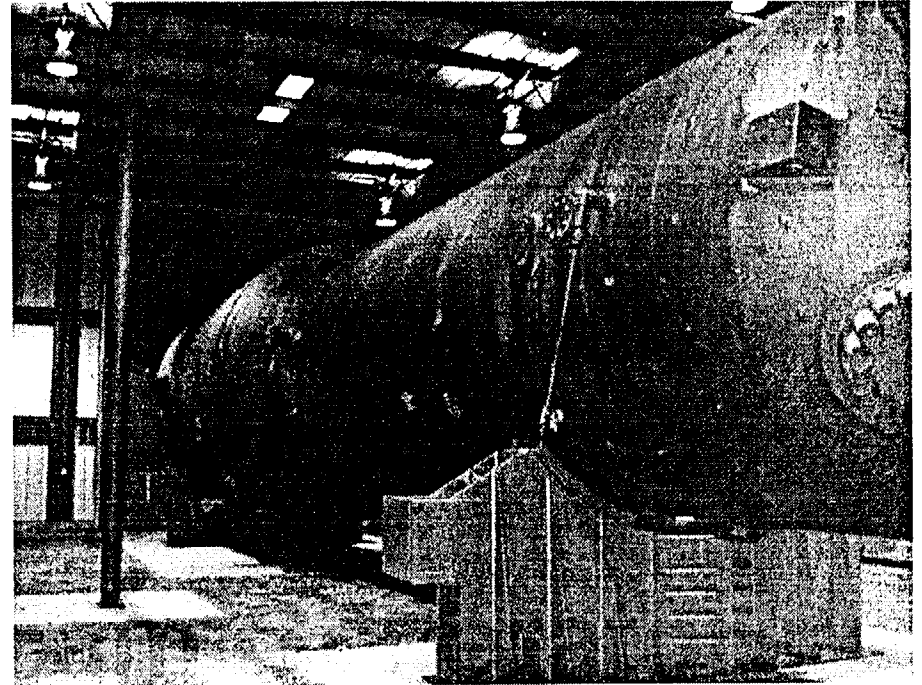
# **Enhancing Steam Generator Life**

- **Steam generator inspection program meets industry standards**
- **Operating temperature**
- **Water chemistry**

# **Work In Progress**

- **Characterize the shape and size of the flaw**
- **Completely understand why the tube failed**
- **Identify differences between previous and current inspection results**
- **Evaluate the condition of all four steam generators**
- **Take corrective actions to prevent recurrence**

# Replacement Steam Generators



- Purchased as contingency in late 80's
- Evaluating timing of replacement on outage to outage basis
- New steam generators have improved design features