

J-066



FENOC

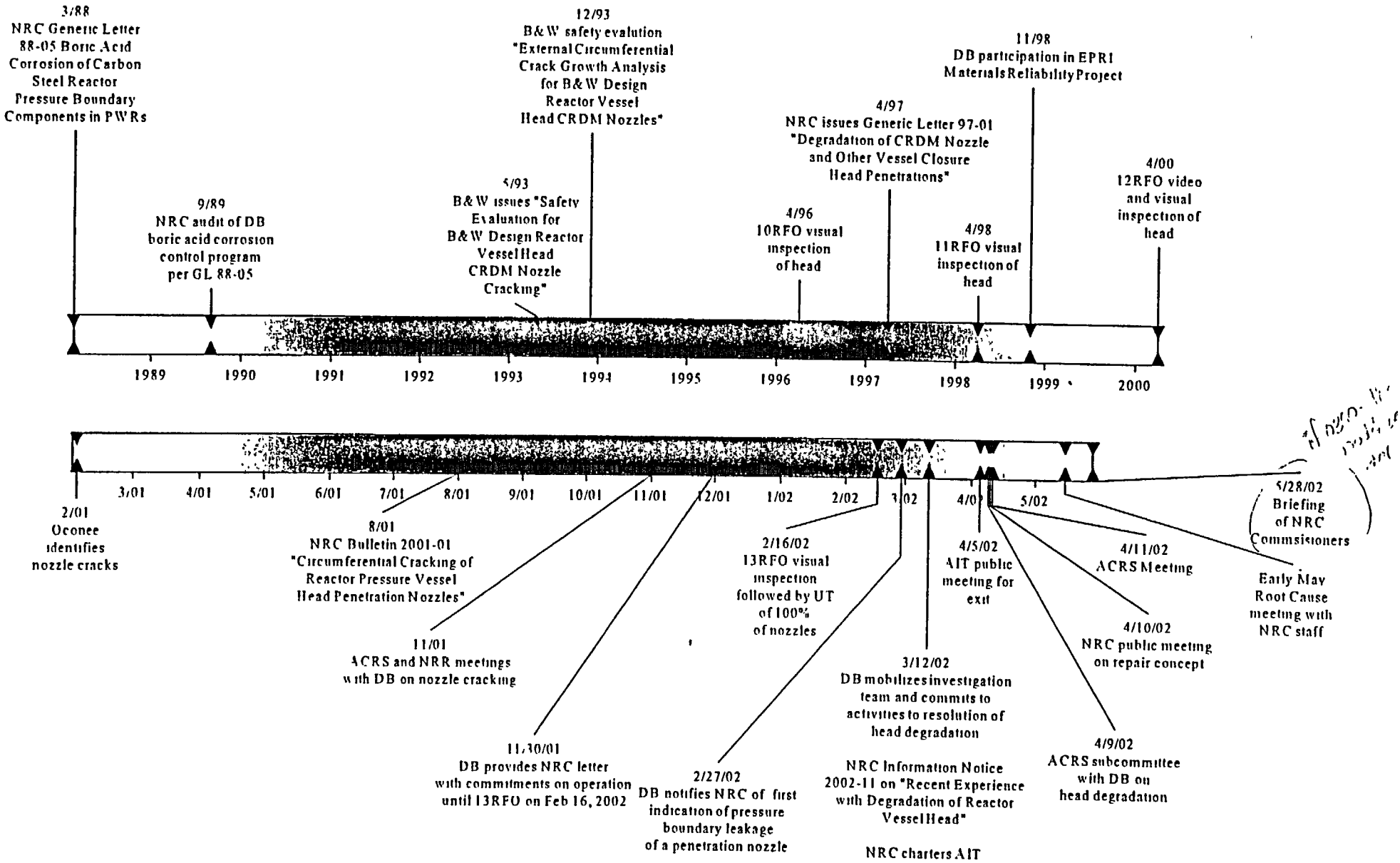
FirstEnergy Nuclear Operating Company

**Davis-Besse Nuclear Power Station
Reactor Pressure Vessel Head Issues**

April 17, 2002

NRC-001

CRDM Nozzle Issues Timeline



FENOC

Davis-Besse Actions To Date

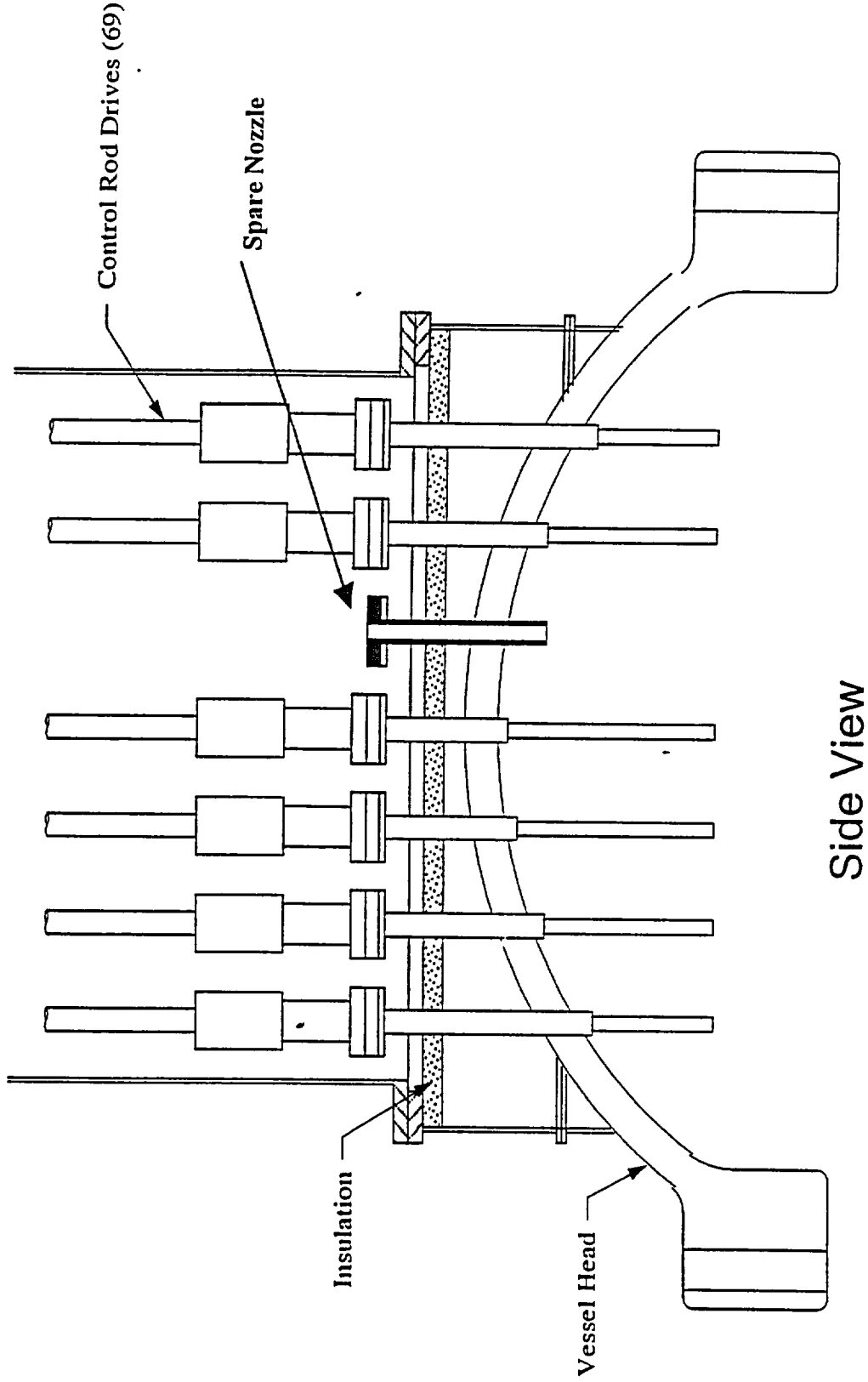
- Visual inspections since 1988
- Commitment to start refueling outage early
- Compensatory measures until start of refueling outage
- Most comprehensive inspection of reactor head in industry to date
 - Hairline axial cracks found in 5 nozzles
- Formation of FENOC Investigation Team
- Complete weld repairs on 3 nozzles



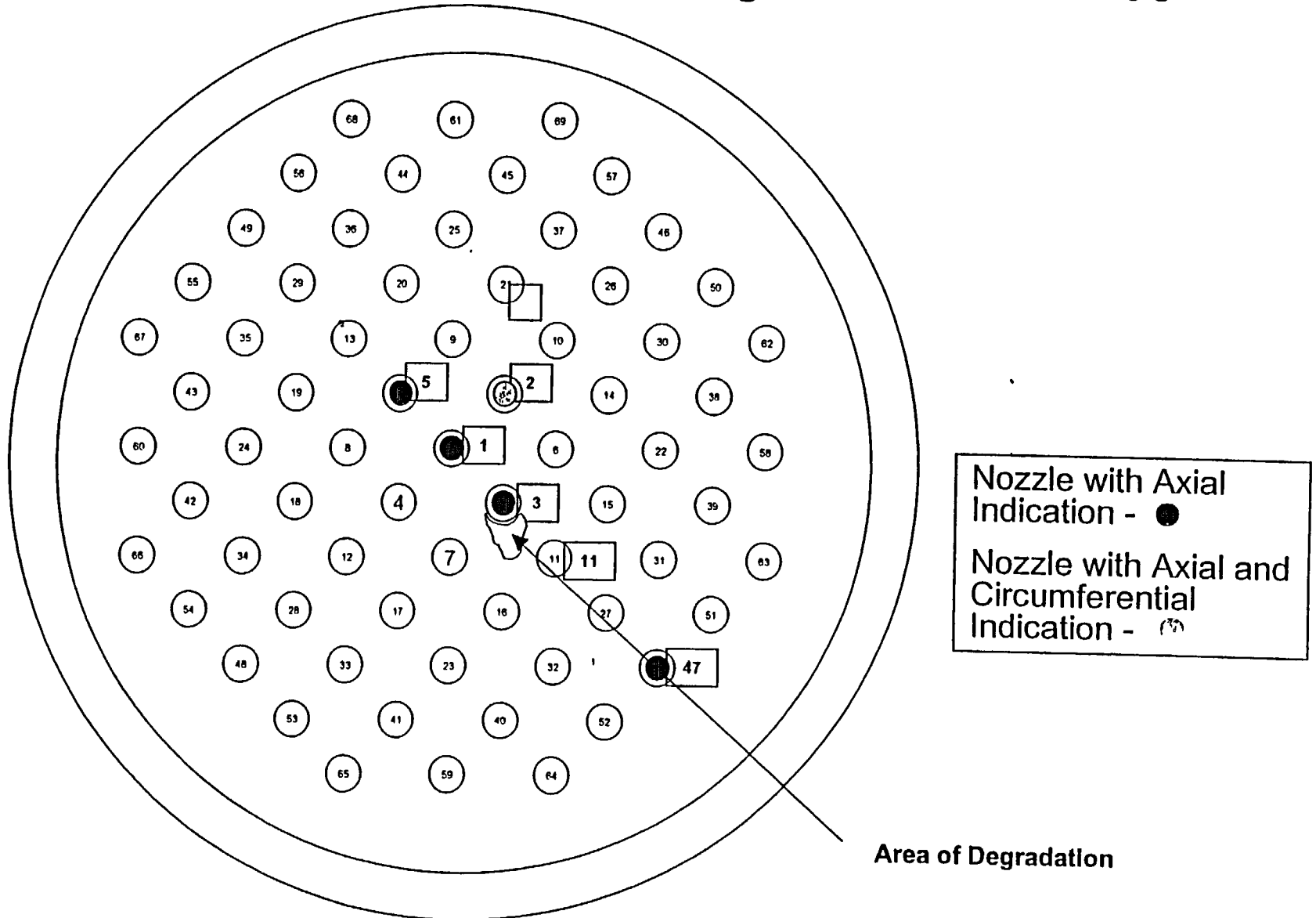
FENOC

Reactor Vessel Head

Source: EPRI/DEI



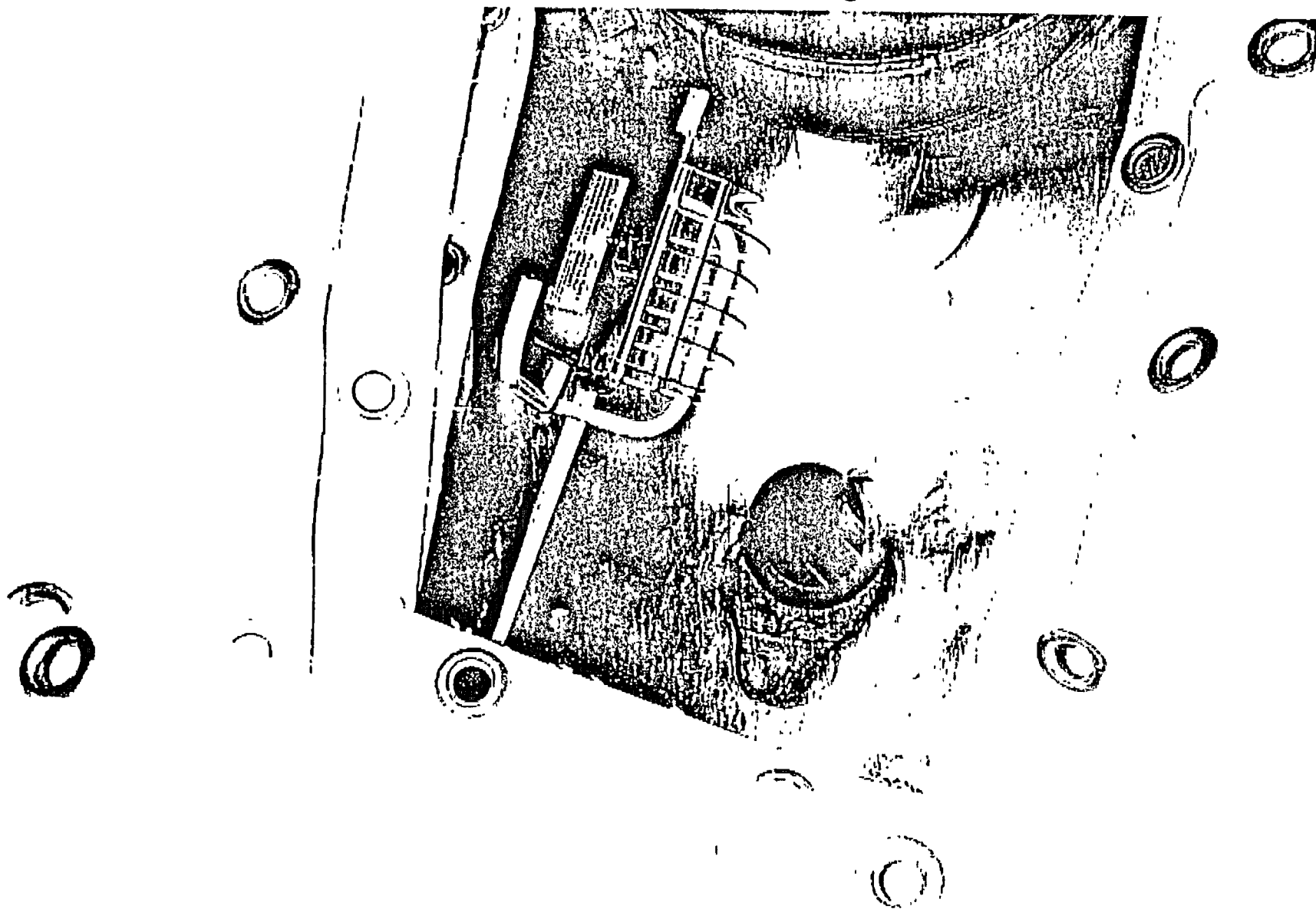
Reactor Head Diagram Showing Cracked Nozzles



Addressing the Problem

- Special team formed to investigate root cause
 - includes Framatome, EPRI, INPO, Oconee, MRP and other industry experts
- Team to create repair plan
- Safety Assessment submitted to NRC April 8
 - Plant operated safely during this condition
- Repair plan to be submitted during April
- Contingency plan available
- New head previously ordered for installation in 2004

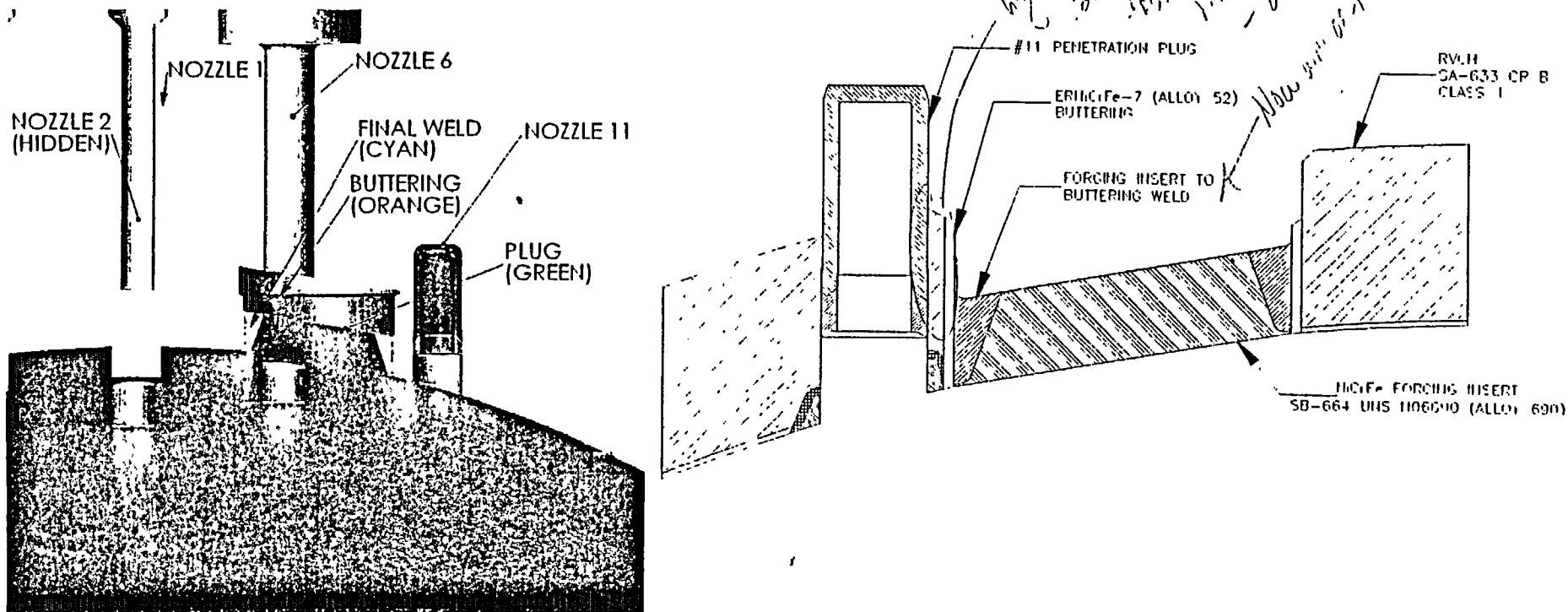
View with insulation removed and shielding installed



2002. 3. 16 17x37

FENOC

Repair Proposal, Nozzle 3 and Area Adjacent



Hole cut at nozzle 3, plug installed and welded

FENOC Root Cause Summary

■ Probable Cause

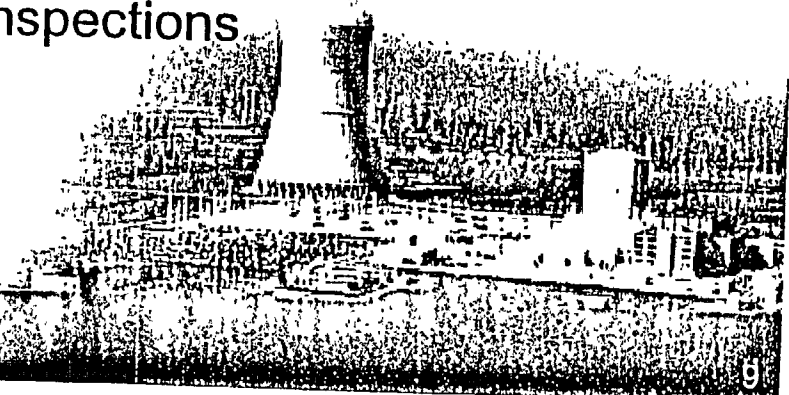
- ... Through wall cracking of CRDM nozzle, resulting in boric acid corrosion of Reactor Pressure Vessel (RPV) head low-alloy steel.

■ Contributing Causes

Failure to clean boric acid from RPV head

- Design of RPV service structure limited access for cleaning and inspections
- Deferral of modification to install portals to service structure to allow cleanings and inspections
- Deferral of head cleaning and inspections

Since 14/10



FENOC Root Cause Summary

(continued)

■ Causal Factors

- .. Acceptance of boric acid accumulation on RPV head from CRDM flange leakage
- .. Failure to recognize symptoms of leakage collected from Containment Building monitors
- Harsh environmental conditions
- Boric acid corrosion control program targeted CRDM flange leakage