

**Commissioners TA Briefing  
Davis-Besse Reactor Vessel Head**

**AGENDA  
March 14, 2002**

- Introduction..... Brian Sheron
- Status at Davis-Besse..... Region III
- Technical Issues..... Ken Karwoski
- Risk Implications..... Steve Long
- Communication Activities..... Tony Mendiola
- Summary..... Brian Sheron

**Predecisional**

NRC-001

**I-09A**

**CONFIDENTIAL**

# STATUS AT DAVIS-BESSE

## Licensee Activities

Shutdown in February 2002  
Vessel head penetration nozzle inspections  
Inspection results  
Root cause team

## Region III Activities

Augmented inspection team  
Confirmatory Action Letter

## AIT activities/issues

## TECHNICAL OBSERVATIONS

Boric acid-like-material covering reactor pressure vessel head for several cycles

3 leaking vessel head penetration nozzles including nozzles 2 and 3

Two cavities - one near nozzle 2 and one near nozzle 3

Largest cavity - nozzle 3

Length: approximately 5-inches

Width: approximately 4 to 5-inches at widest point

Depth: approximately 6-inches

Root cause investigation is on-going

Either the deposits on the top of the head, the leaking penetration, or both could contribute to the degradation

Boric acid may be a contributor

## HISTORICAL PERSPECTIVE

Boric acid corrosion well documented

Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel reactor Pressure Boundary Components in PWR Plants"

Industry assessment of wastage at top of head as a result of a leaking nozzle - 1993

Water will flash to steam leaving dry boric acid crystals which have a slow corrosion rate

Maximum wastage rate of 6.4 in<sup>3</sup>/yr

RPV boric acid corrosion experience at Salem 2

3 feet by 5 feet by 1 foot high pile of boric acid crystals

9 corrosion pits ranging from 1 to 3 inches in diameter and to a depth of 0.4-inch

## CURRENT STATUS

Monitoring results at Davis-Besse to assess generic implications

### RES Activities

NRR and RES developing near- and long-term plan to address structural integrity, corrosion mechanism/mitigation, and NDE issues

RES is also planning to look at thermal hydraulic response

Developing models for assessing structural integrity of degraded area and repair proposals

Preliminary calculations underway

Reviewing boric acid operating history

Supporting review of licensee and MRP activities

RES staff member participating on AIT

## **GENERIC TECHNICAL ACTIVITIES**

Issued letter to industry on March 11, 2002 documenting prior phone calls

Requested justification for continued operation for plants that have not inspected

Requested risk assessment

Industry provided preliminary results on March 13, 2002 and will provide detailed results next week

Visual exam of 100% of head?

If not 100%, can external corrosion be ruled out?

If UT or other approach used during most recent inspection was UT capable of detecting cavity?

Plans for Spring 02 outages?

Preparing Bulletin and associated Information Paper

## RISK IMPLICATIONS

Rupture of the exposed clad area would create a medium LOCA

Conditional probability of core damage for a medium LOCA is  $7E-3$  in Davis Besse IPE

Conditional probability for large early release for medium LOCA core damage events is about 0.006 for large, dry containments in NUREG-1150 PRAs

Bottom line:

CDP appears to be about  $E-3$ ;

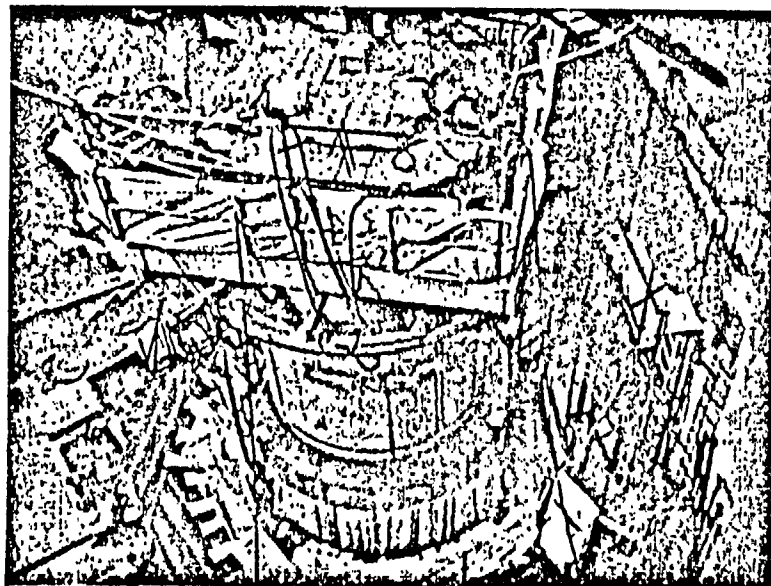
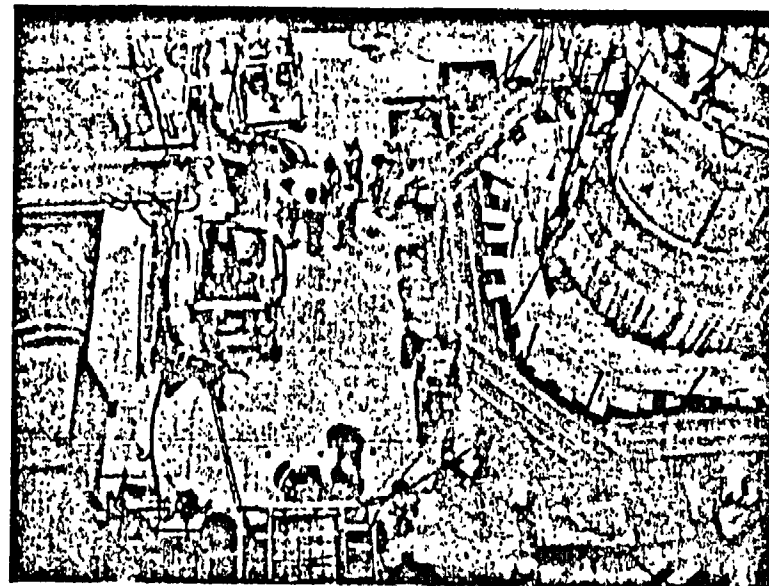
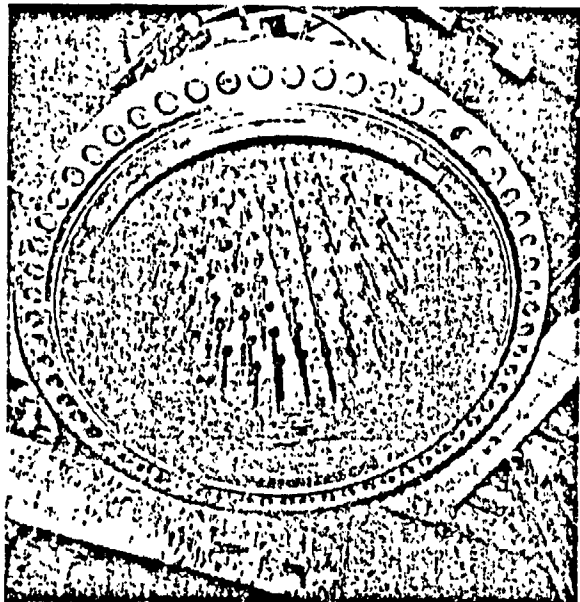
LERP appears to be about  $E-5$ .

## COMMUNICATION ACTIVITIES

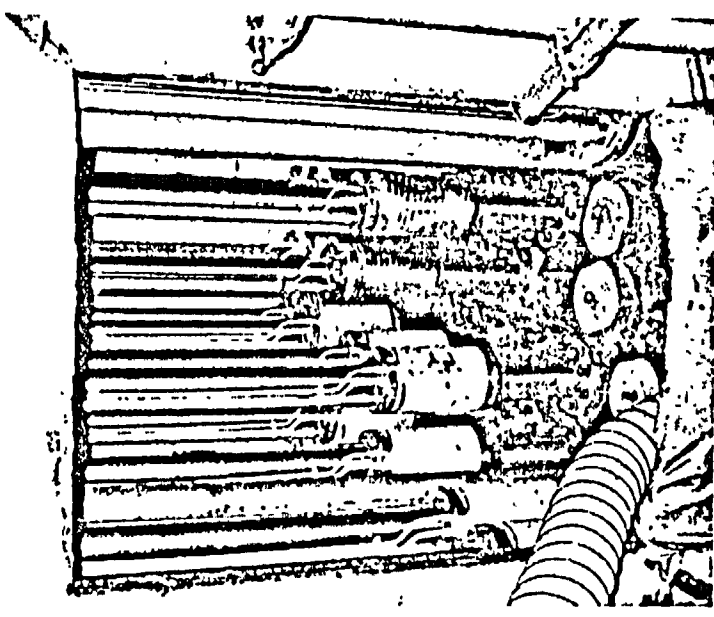
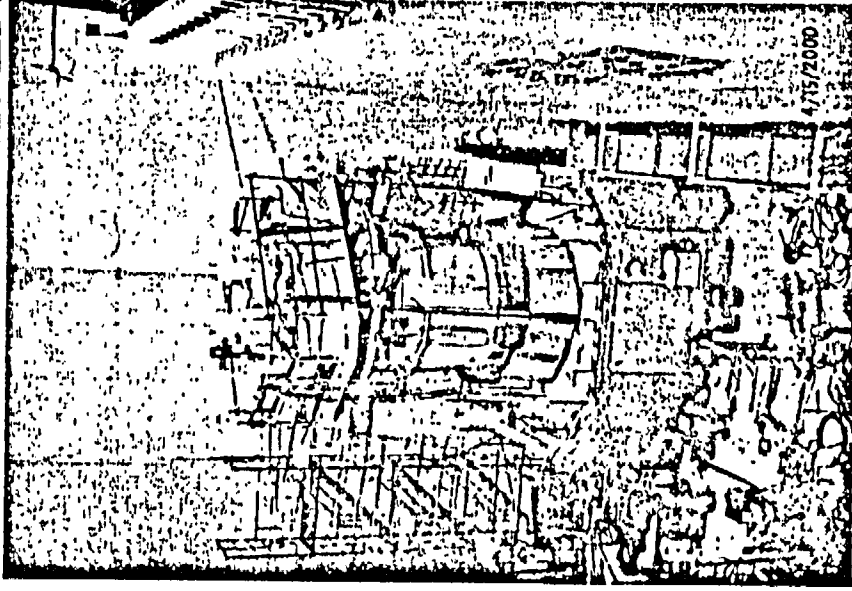
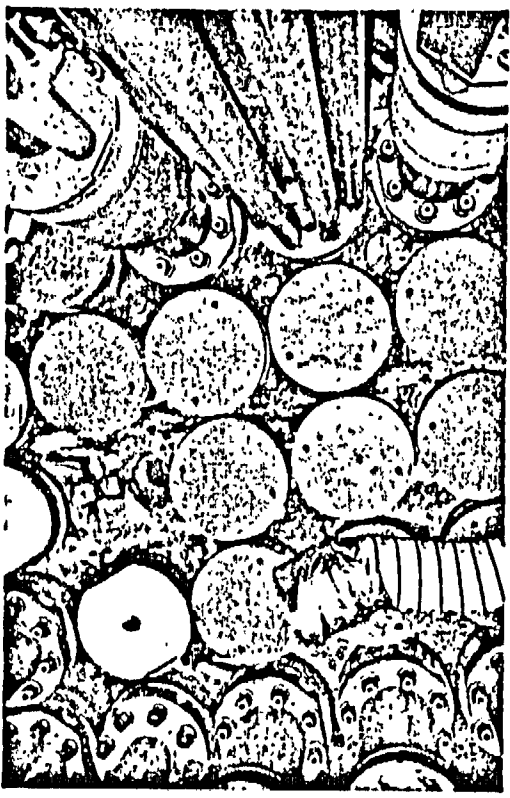
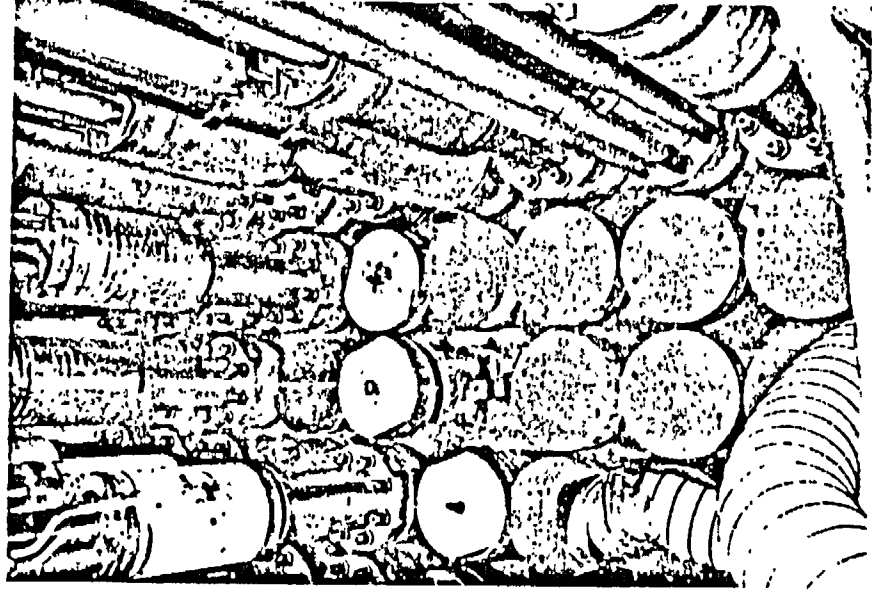
Initiated daily status briefings between licensee, Region 3, and NRR	03/06/02
Issued Preliminary Notification of Event	03/08/02
Initiated Communication Plan	03/11/02
Issued NRC Information Notice (IN-02-0011)	03/12/02
Issued AIT Press release	03/12/02
Initiated NRC website for public information	03/13/02
Issued Confirmatory Action Letter	03/13/02
Commissioner's TA Briefing	03/14/02
CRGR Briefing for draft NRC Bulletin	03/18/02
Public Meeting between NRC and Industry Representatives	03/19/02
Public Meeting for NRC Stakeholders	03/20/02
ACRS Subcommittee Briefing on Event	04/09/02



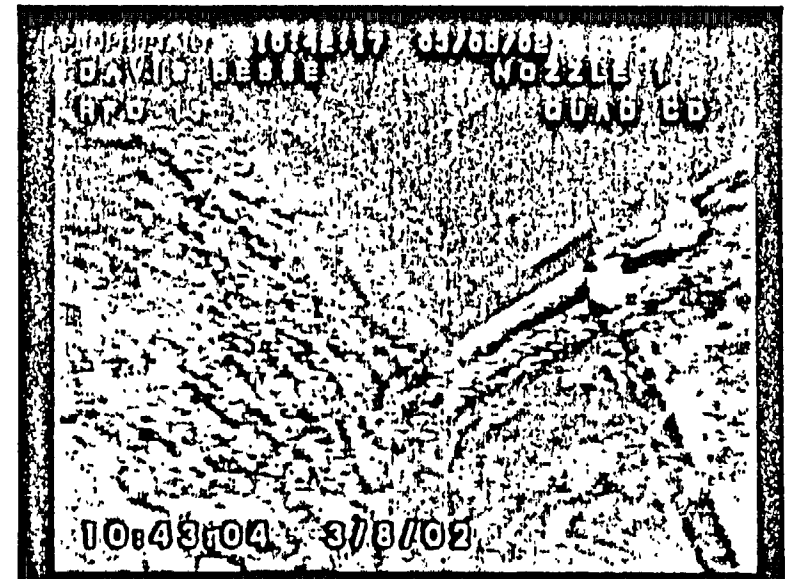
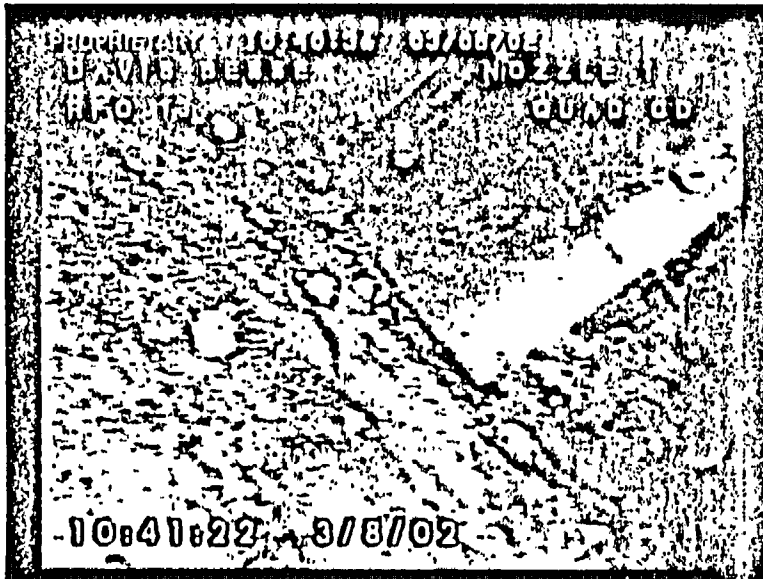
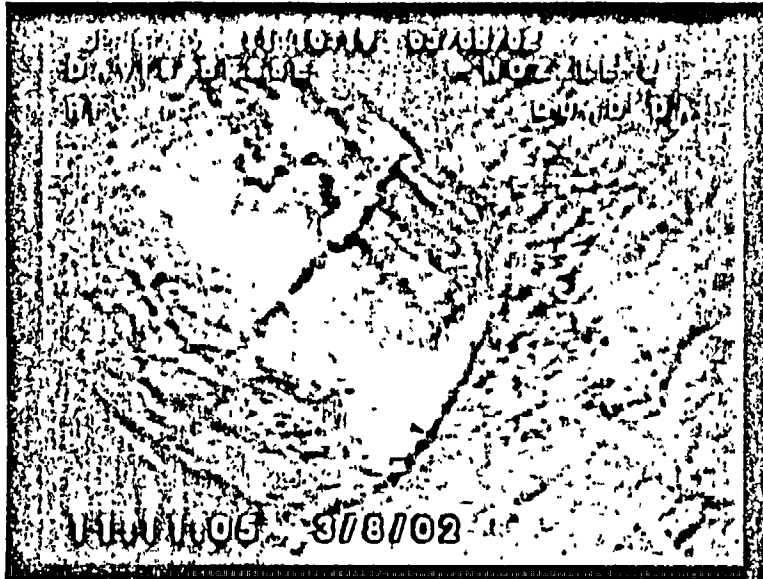
# DAVIS-BESSE RPV HEAD

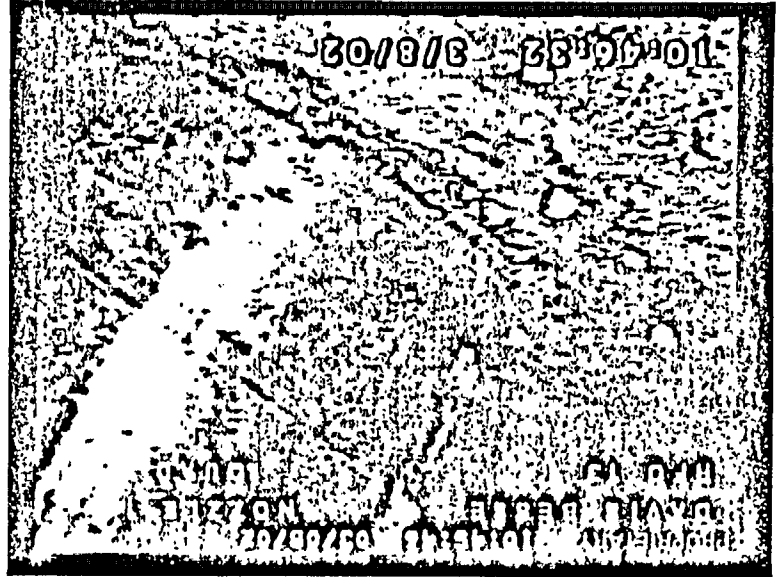
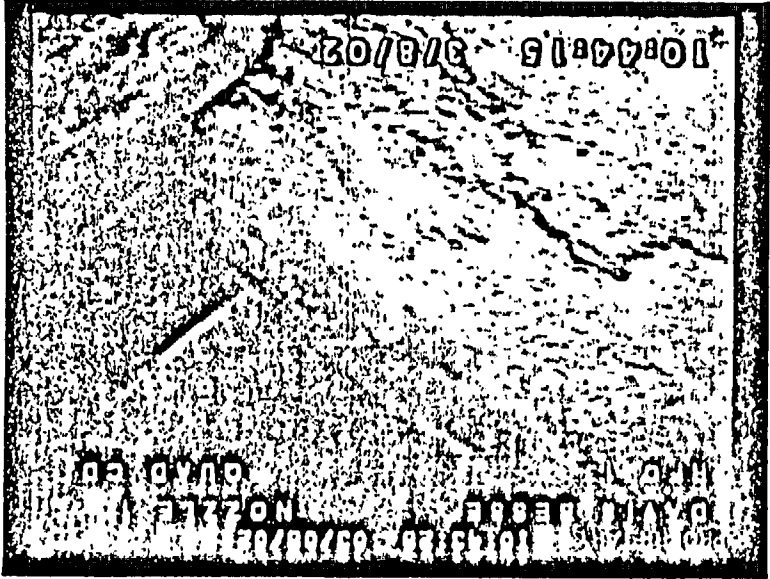
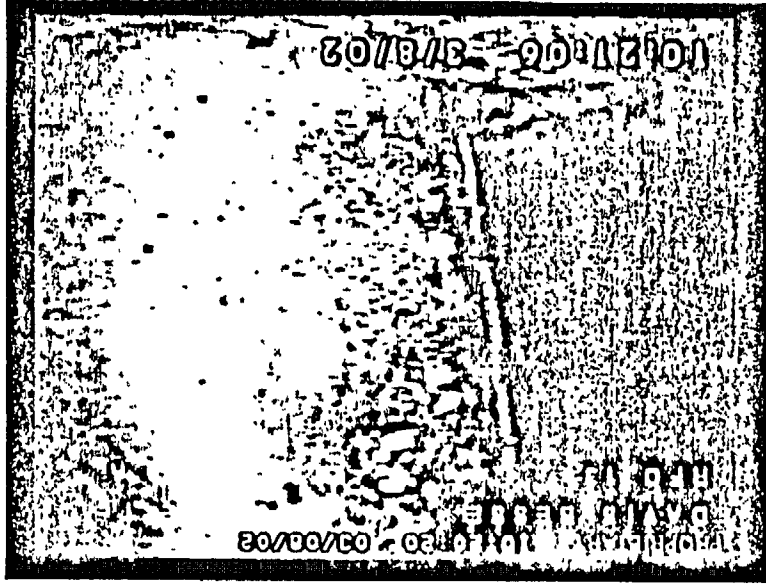


DAVIS-BESSE RPV HEAD



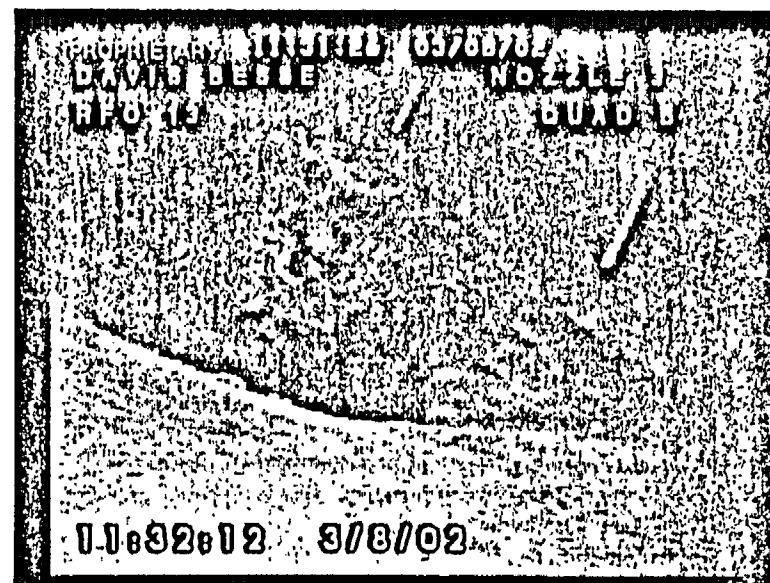
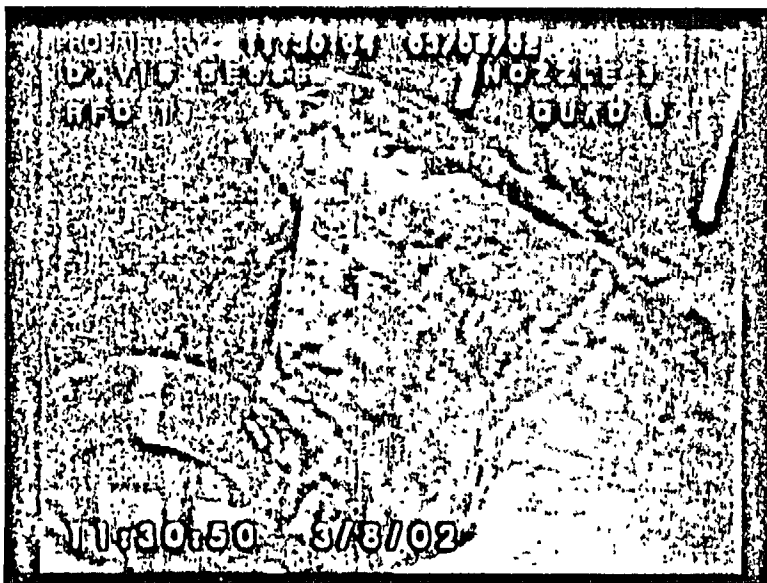
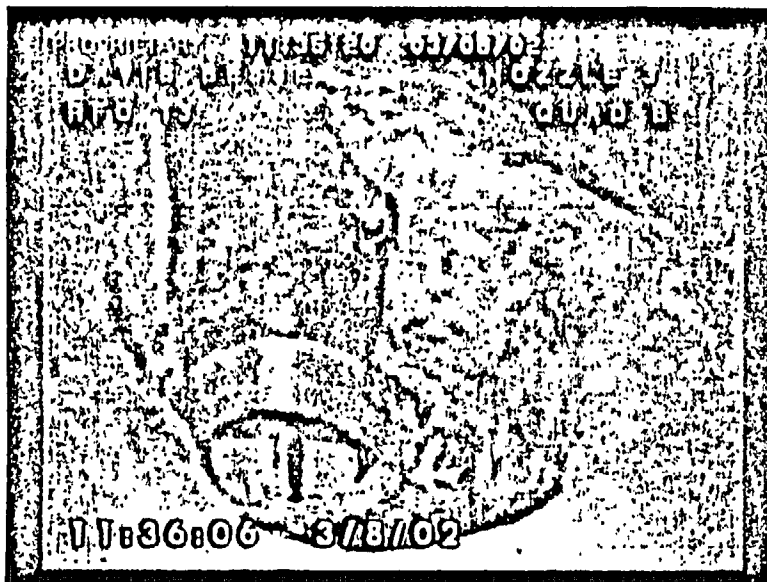
# DAVIS-BESSE NOZZLES 1 AND 2



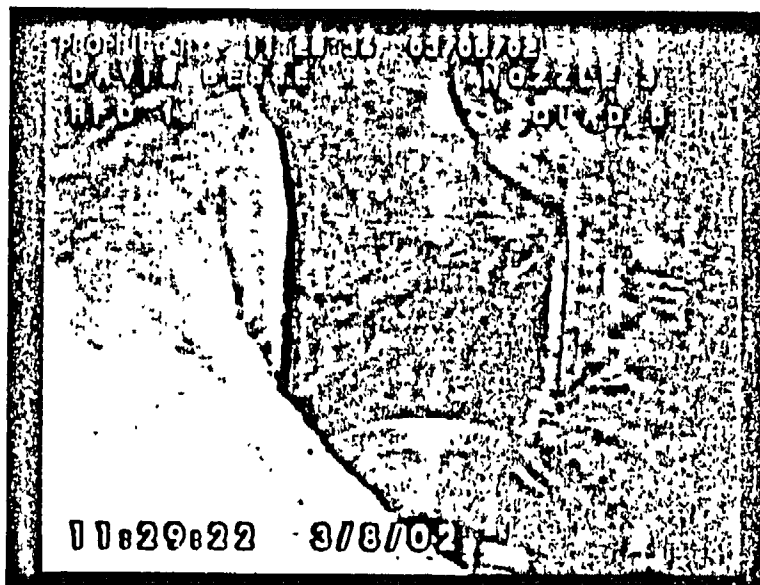
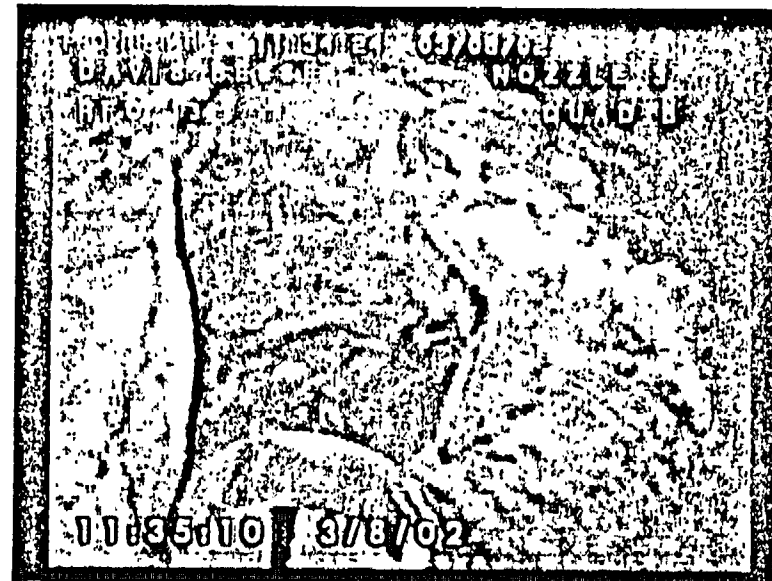
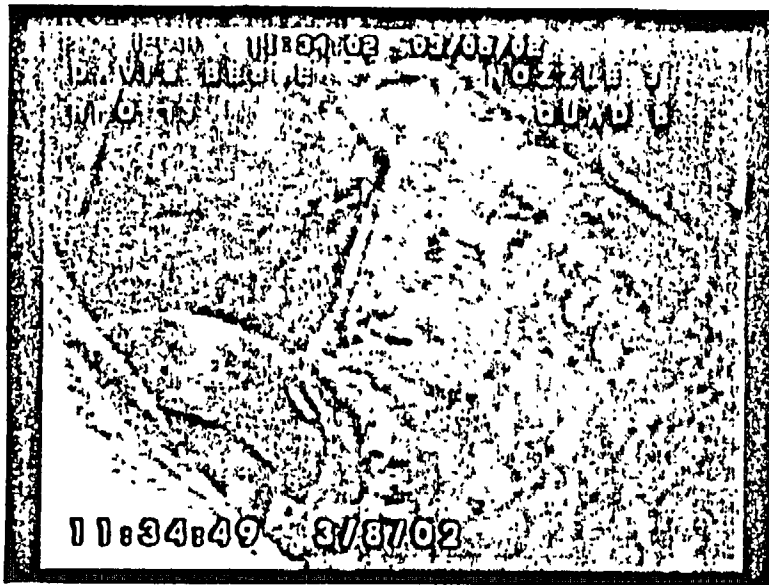


DAVIS-BESSE NOZZLE 1

# DAVIS-BESSE NOZZLE 3



# DAVIS-BESSE NOZZLE 3



# DAVIS-BESSE NOZZLE 3 - VIEWS OF TOP OF RPV HEAD

(Brown area is borated water at the bottom of the cavity)

