

# DAVIS-BESSE SHIELD BUILDING CRACK

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*NRX*

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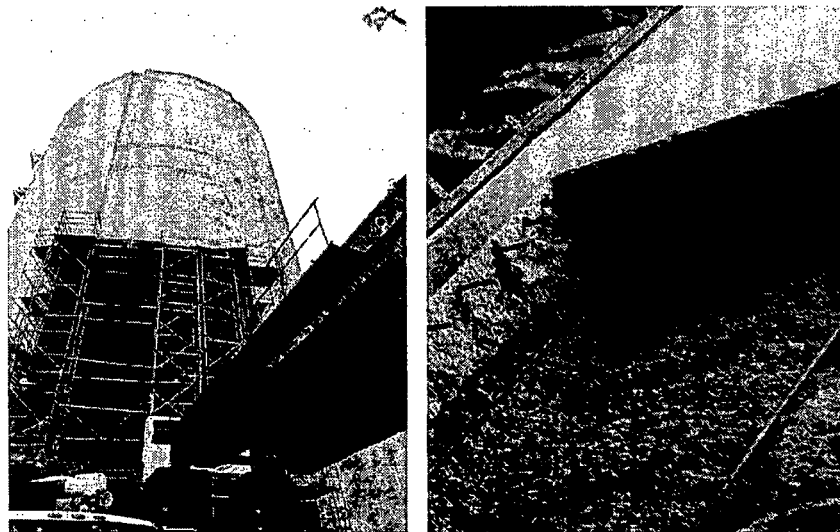
## Agenda

- Initial Condition
- Condition Assessment
- Licensee's Position
- NRC's Position
- Impact on License Renewal

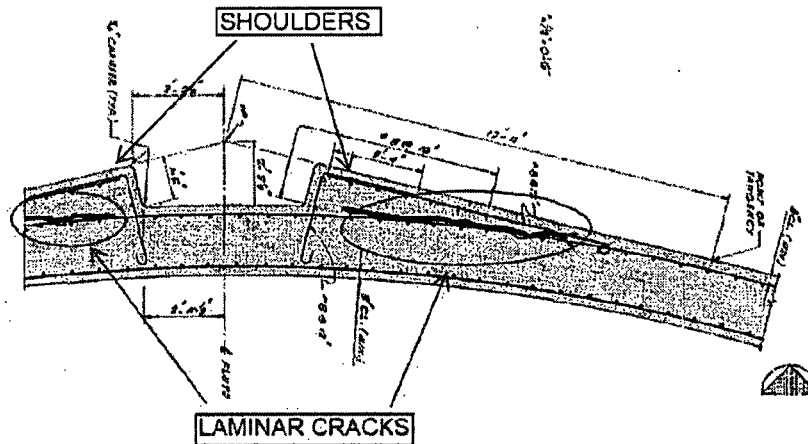
## Initial Condition

- Laminar crack identified in architectural flute shoulder area during hydro-demolition for replacement of reactor vessel closure head (October 10<sup>th</sup>)
- Crack found on the vertical side of the opening (left side, looking from the outside), generally along main reinforcing steel, and extends ~6' across the top and ~4' across the bottom

## Construction Opening



## Flute/Shoulder Geometry



## Condition Assessment

### Initial Investigation

- "Chipping back" along cracked areas revealed crack extended beyond construction opening
- Impulse Response (IR) methodology employed to investigate extent of crack
- IR testing indicated crack extended ~38' above construction opening
- (4) core bores taken to validate IR results
  - Indicated crack existed near outer reinforcement mat

### Flute Shoulders

- IR testing performed on 15 of 16 flute shoulders
- Core bores taken on 12 shoulders to confirm crack boundaries
- Core bores inspected using boroscope to identify crack depths and widths
  - Very tight, less than 0.01"

## Condition Assessment

### Flute Areas

- IR testing performed on 4 of 8 flute areas
- Core Bores taken from 6 of 8 flute areas
- IR testing and core bores confirmed laminar cracking not present in flute areas
  - ▣ One flute did have a vertical crack, but determined to be isolated condition

### Main Shell Areas

- IR testing performed in 7 of 8 areas between flute shoulders
- Two small regions adjacent to Main Steam Line penetration blockouts are cracked
  - ▣ Extent of cracking unique to penetrations
- Cracking regions exist at top 20' of Shield Building wall outside shoulder area
- Spring line area appears to have little or no cracking (top 5')

## Condition Assessment Summary

- Cracking is generic to all flute shoulder regions
- Cracks are confined to flute shoulder regions with exception of top 20' of Shield Building wall and two small regions near MSL penetrations
- Cracking exists at top 20' of Shield Building wall outside shoulder region (investigation ongoing)
- Cracks are very tight, <math><0.01\text{''}</math>, and located near the outer reinforcing mat

## Licensee's Position

- Believe sampling method of IR testing and core bores has characterized the extent of cracking in the structure
- Primary concern is ability of outside rebar to perform its intended function. Observations of construction opening and testing indicate concrete is firmly attached to rebar mat
- Based on structural evaluation, cracking does not impact ability of structure to perform its intended safety function
- Root cause is underway

## NRC's Position

- NRC informed licensee they could restart (12/2)
  - Licensee developed a model with reasonable assumptions which demonstrated adequate margin for operability
  - Staff continues to evaluate whether the shield building conforms to the design code requirements in the CLB
- NRC issued CAL which included commitments to:
  - Determine root cause and develop a long-term monitoring program (due 2/28/12)
  - Select multiple un-cracked areas to investigate to verify the cracking is not spreading (due 90 days)
  - Analyze known cracked areas to verify the cracks are not growing

## License Renewal Impact

- The degraded shield building is a Part 50 issue affecting license renewal
- DLR needs to understand if the degradation is age-related, and if so how it will be managed
- DLR has prepared a draft RAI asking the applicant to explain how the unique OE will be addressed by its AMPs
  - Currently finalizing RAI based on last week's developments and will be prepared to issue shortly
  - This will be tracked as an Open Item in the SER