

NCR Number: 358724	Assignment Number: 23
Description of SSC: Crystal River Unit 3 (CR-3) Containment	

1.0 Description of Identified Concern

While performing hydro-demolition of the CR-3 post-tensioned concrete containment for creation of a construction opening, cracking of the concrete was found. The cracking is located roughly in the cylindrical plane of the centerline of the hoop tendons. The cracking is not limited to the opening, but can be observed at the edges of the opening extending into undisturbed concrete for an indeterminate distance. Water from the hydro-demolition was observed leaking from the outside surface of the containment at various locations below the elevation of the bottom of the opening. Some leakage locations observed were beyond the horizontal extent of the opening.

Impact on the operation and component function described

The discovery of cracking which extends outside the construction opening brings into question the capability of the containment to contain internal pressure without leakage or breach. This NCON will only examine the containment function during Modes 5 and 6.

2.0 Safety Significance

Determine required function(s) performed by the SSC

In Mode 6 Improved Technical Specifications 3.9.4 and 3.9.5 Required Actions specify that containment penetrations must be closed to mitigate the dose consequences of a loss of decay heat removal (LODHR) event. This includes that the containment must maintain leak tight integrity in the event of LODHR. Failure or leakage of the containment following a LODHR could release radioactivity to the environment resulting in radiation dose to the members of the public. AI 504 requires Containment Closure-Pressure Retaining in Modes 5 and 6.

3.0 Licensing Basis

The CR-3 Operating License Number DPR-72 establishes that CR-3 will be maintained and operated in accordance with the descriptions in the Final Safety Analysis Report (FSAR) [License Condition 2.A], and shall be subject to the Technical Specifications through the latest Amendment [License Condition 2.C.(2)]. There are no FSAR identified criteria for the performance of the containment in shutdown modes. As stated above, two Technical Specification Required Actions apply to the containment. In response to Generic Letter (GL) 88-17, CR-3 established regulatory commitments to maintain key safety functions during shutdown conditions. These commitments are implemented principally by AI-504. Specifically on LODHR event Containment Closure-Pressure Retaining must be established and maintained. AI-504 and calculation M92-0041, Revision 2 establishes that the requirement for Containment Closure-Pressure Retaining is to be qualified to retain an internal pressure of 5.14 psi. GL 88-17 Enclosure 2 when discussing calculations supporting shutdown mode operations states that:

“Realistic thermal-hydraulic and mechanical analysis methods (with suitable safety factors in a few situations) rather than the evaluation model methods and multiple conservatisms that are often used for evaluation of power operation.”

Therefore, the application of reasonable and supportable assumptions may be used in calculations demonstrating key shutdown safety functions will be accomplished.

Applicable active OCRs/NCONs are considered

There are no active Operability Concern Resolutions, and this is the only active NCON. There is however an active REW for modes 1-4

4.0 Impact Analysis and Reliability Considerations

Impact on Safety Function and Licensing Basis

Calculation S06-0007 verified the structural and leak tight integrity of the containment with all concrete removed from the construction opening down to the containment liner. That calculation assumed that the remaining concrete was intact and met the minimum strength requirements stated in the FSAR. The extent of cracking identified during hydro-demolition invalidates the basis for the conclusion of S06-0007. In the judgment of the Engineer that performed calculation S06-0007, there is reasonable assurance that the containment will safely perform the shutdown safety function of Containment Closure-Pressure Retaining. A new or revised calculation will be performed to demonstrate that the Containment Closure-Pressure Retaining shutdown safety function can be performed successfully.

- Impact of identified concern (Section 1.0) compared against safety function (s) (Section 2.0) and licensing basis (Section 3.0)
- Reliability Considerations of Component

- Mission time explained and analyzed

Calculation M92-0041, Revision 2 includes the assumption that decay heat removal will be restored after 4 hours. Four hours would correspond with the time that the maximum internal pressure would be reached, since heat removal would be recovered via the decay heat system at that time, containment internal pressure would begin to be reduced.

- For SSCs requiring generation of a Condition Resolution (CR), consider whether the SSC will remain Operable while the Condition Resolution evaluation is being performed.

5.0 Operability Evaluation

- Mode of plant operation

This evaluation is only for Modes 5 and 6. In Mode 6 there are no Limiting Conditions for Operation or requirements for containment Operability. In Modes 5 and 6 Containment Closure-Pressure Retaining is required per CR-3 regulatory commitments and AI-504.

- Can it still perform its safety function and how?

Calculation S09-0045 has evaluated the containment with the following physical conditions

Dead Load

- ☆ Reduced Prestress Load
- ☆ Wind Load
- ☆ LODHR accident pressure 5.14 psig
- ☆ LODHR accident temperature

- What additional measures are required to enable this component to perform its function?

None

- What is the aggregate affect?

6.0 Conclusion/Extent of qualification described:

- Operable, but degraded (non-conformance)

Containment is not required to be Operable to meet Containment Integrity requirements, but is required to perform the key safety function of Containment Closure-Pressure Retaining. Based on calculation S09-0045, the containment will perform this function. The containment is designated as Use-As-Is with no compensatory actions required. This is applicable for modes 5 6 & no mode only

7.0 References

CR-3 FSAR

CR-3 Improved Technical Specifications

Correspondence on GL 88-17

- CR-3 to NRC letter 3F0189-02, dated January 4, 1989
- NRC to CR-3 letter, dated May 18, 1990
- CR-3 to NRC letter 3F0690-15, dated June 29, 1990

8.0 Attachments and Figures

None

ATTACHMENT 6
 Sheet 1 of 1
OCR/NCON Approval Form

OCR/NCON APPROVAL FORM		
NCR Number		Assignment Number
Description of SSC		
Personnel Involved in Preparation		
Print Name	Title	Signature
Shift Technical Advisor / Licensed Operator Review		
Signature		Date
Supervisor/ Additional Reviews (as required)		
Supervisor		
Signature	Title	Date
Supervisor		
Signature	Title	Date
Licensing		
Signature	Title	Date
SSO Closure/Approval		
Signature		Date

This document becomes a QA Record upon completion of final signature.