

REGION II ICE CONDENSER (IC) INSPECTION PLAN

REV 3, DATED JULY 9, 1998
UNDERLINE - CHANGES FROM REV 2, MAY 13, 1998

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Based on the results of the D.C. Cook inspection results (See attached D.C. Cook IC Issues list), Region II intends to inspect the four RII IC facilities, focusing on the following areas: A. IC Surveillance Test Program, B. IC Corrective Action Program, and C. Maintenance of the IC Design Basis Program, and D. IC Potential Generic Part 21 Reportability Issue. The plan is divided up into five major phases: Information Acquisition, Confirmation Review, Scheduled Inspections and Reviews, Allegations, and Lessons Learned.

NOTE: COMPLETED

- I. **INFORMATION ACQUISITION/DISSEMINATION** - Gather all the appropriate information from DC Cook, RII plants and allegor; coordinate RII efforts with RIII and NRR, and disseminate new information to appropriate staff and licensees. No inspection activity during this phase, but review of Cook data.

<u>ACTIVITY</u>	<u>STATUS</u>
RII DRS Branch Chief (Fredrickson) coordinate Cook issues with RIII Branch Chief (Gavula), and NRR IC lead (Martin).	Ongoing since 3/3
RII IC assigned inspector (Economos) coordinate with RII SRIs and RIII IC inspector. (Holmberg).	Ongoing since 3/16
Gather/Provide Information	
Cook enforcement action worksheet (DRS)	From RIII on 3/13
Cook inspection report (DRS)	From RIII on 4/14 Provided to SRIs on 4/15 SRIs to Lic. on 4/16 RII Letter to Lic. on 4/22
History of IC problems at four RII facilities (SRI)	From SRIs on 3/31
Additional information from IC allegor (EICS)	Requested on 3/30 From Allegor on 4/6
Attend Cook enforcement conference (EC) (DRS)	Attended on 5/20
Visit Cook to observe deficiencies (DRS)	Visited on 5/19

This document contains predecisional information
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3/31
Received P. Fredrickson

- II. **CONFIRMATION REVIEW** - Conduct a quick focused inspection of the RII plants to provide a reasonable assurance that IC material condition is being sufficiently maintained so that a structured and scheduled inspection effort can be conducted to verify adequacy of the IC. Review activity limited to resident inspectors onsite review of surveillance process and DRS in-office review of surveillances and past RII plant history.

<u>ACTIVITY</u>	<u>PLAN./COMPL</u>
Discuss IC surveillance performance process with licensee using DRS provided standard questions and provide info to DRS (SRI)	4/10 / 4/17
In-office review of IC surveillances and SRI info (DRS)	5/1 / 5/5
Compare Cook issues to past RII plant problems (DRS)	5/1 / 5/1
Evaluate for scheduled inspections or reactive and brief RII RA (DRS)	5/8 / 5/8

- III. **SCHEDULED INSPECTIONS AND REVIEWS** - Provide a detailed review of the four IC plants addressing the four areas discussed above. This phase will extend from May 1998 to April 1999. The actual inspection of surveillance performance and hardware condition must be done during an outage. The outage schedule for the four plants is as follows: McGuire - 5/29-7/2/98; Catawba - 9/5-10/20/98; Sequoyah - 9/9-10/8/98; and Watts Bar - 2/27-4/12/99. All sites except McGuire will have three inspections, with the first two inspections conducted by the DRS IC inspector prior to the outage, consisting of one inoffice review of condition reports and one onsite inspection for one week. The third inspection will be conducted during the outage, encompassing the entire time that ice condenser activities are ongoing. The outage inspection will be conducted by the RII DRS IC inspector during one week, supported by RIs from the inspected site for the remainder of the outage. McGuire will be inspected only during the outage, with two onsite weeks for the DRS IC inspector, in which all Section III activities will be reviewed. Nonoutage inspections will be documented in DRP integrated inspection reports and outage inspections will be documented in separate DRS integrated reports. The extent of the planned inspections may be adjusted up or down as additional information is received from SRI or licensee review prior to the conduct of the inspections.

ACTIVITY	SCHEDULED INSP. WEEK (SITES/IR NO.s/DATE ISSUED)			
	CAT	MCG 98-11	SEQ	WB
A. IC Surveillance Test Program				
On-site witness surveillance performance (DRS) (along with Confirmation Review results)	9/14/98	6/1/98	9/28/98	3-4/99

B. IC Corrective Action Program

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|---|----------------|---------------|----------------|----------------|
| 1. In-office review of condition reports (DRS) | <u>7/27/98</u> | <u>6/1/98</u> | <u>8/10/98</u> | <u>8/10/98</u> |
| 2. On-site inspection of corrective actions (DRS) | <u>8/3/98</u> | <u>6/1/98</u> | <u>8/24/98</u> | <u>8/31/98</u> |

C. Maintenance of the IC Design Basis Program

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|--|----------------|----------------|----------------|----------------|
| 1. On-site inspection of modifications against design basis -- hardware and design (DRS) | <u>9/14/98</u> | <u>6/22/98</u> | <u>9/28/98</u> | <u>3-4/99</u> |
| 2. On-site review of modifications against FSAR changes (DRS) | <u>8/3/98</u> | <u>6/1/98</u> | <u>8/24/98</u> | <u>8/31/98</u> |
| 3. Review IC material condition (DRS) | <u>9/14/98</u> | <u>6/22/98</u> | <u>9/28/98</u> | <u>3-4/99</u> |

D. IC Potential Generic Part 21 Reportability Issue

Coordinate with RIII and NRR review of Westinghouse activities

Ongoing.

- IV. ALLEGATIONS** - Coordinate with NRR (John Stang, Cook PM), as the IC allegation lead, on reviewing and inspecting IC-related allegations.

A. RII IC Allegation (Watts Bar)

<u>Review technical issues (DRS)</u>	<u>6/15</u>
<u>Conduct inspections as necessary (DRS)</u>	<u>Info to NRR, 6/22</u>

B. NRR IC Allegation (Westinghouse, Cook, McGuire and Watts Bar)

<u>Review at McGuire</u>	<u>6/22</u>
<u>Review at Watts Bar</u>	<u>8/31</u>
<u>Review technical issues from Westinghouse inspection</u>	<u>8/31</u>

- V. LESSONS LEARNED** - Develop lessons learned information from inspection effort to include recommendations for an IC surveillance checklist, recommended inspection procedure changes and historical book for use in future IC inspections.

ACTIVITY	PLAN./COMPL
Take pictures of inspected areas.	Ongoing
Develop lessons learned package	5/99

ATTACHMENT

D.C. COOK ICE CONDENSER ISSUES IDENTIFIED DURING AN INSPECTION CONDUCTED JANUARY 21 - FEBRUARY 27, 1998

The inspection of the D.C. Cook ice condenser was performed in response to allegations stemming from a Region II allegation at Watts Bar pertaining to missing ice basket sheet metal screws. The inspectors found numerous violations that are grouped into three problematic areas: surveillance testing, corrective actions, and maintenance of the design basis. Each of these areas represents a programmatic breakdown.

At the beginning of the NRC inspection on January 21, 1998, ice condenser surveillance tests had been met and the licensee considered the ice condenser ready for operation. At the conclusion of this inspection on February 27, 1998, the licensee had issued five event notifications pursuant to 10 CFR 50.72 related to inadequacies associated with the ice condenser in each unit and had declared the ice condensers inoperable. The issues discussed are inspector identified or were identified by the licensee as a result of the inspection activity. The inadequacies in surveillance testing and ice condenser material condition and in the control of the ice condenser design basis had existed for at least ten years and many since the beginning of plant operation. Thus, numerous past completed surveillance testing or licensee ice condenser walkdowns or UFSAR update initiatives have failed to identify these problems and represent missed opportunities. In addition, one allegation with multiple concerns was received on D.C. Cook, with one Concern relevant to RII facilities, Watts Bar and McGuire. A potential generic issue was also identified relevant to weld fabrication.

A Ice Condenser Surveillance Test Program Breakdown.

1. Flow Passage Surveillance Procedure

- a The instructions provided for the visual examination to verify that flow passages were free of ice blockage were inadequate. As a consequence, flow passage blockage potentially outside analysis limits went undetected.
- b The instructions provided for selecting flow passages for visual examination were inadequate. As a consequence the selection process used by the Test Engineer was arbitrary, vice systematic and thus inadequate to ensure that a degraded condition would be detected in the ice condenser prior to reaching an inoperable condition.
- c The degraded ice condenser flow passage blockage acceptance criterion lacked margin to the analysis limit.

1. Ice Weight Surveillance Procedure

- a The maximum acceptable gross ice basket weight lacked margin to the analysis limit.
- b Procedure authorized unpinning 60 ice baskets in Modes 3-4 to support ice basket weighing, which was outside existing analysis. Also, procedure lacked instructions to enter

the applicable TS action statement for the time period the ice condenser was rendered inoperable by placing it in an unanalyzed condition.

- c During recent completion of this test for each unit, the licensee staff failed to follow the procedure change process when incorporating a revised TS acceptance criterion.
- d The licensee failed to adequately assess or control the quality of contractors performing this surveillance test which resulted in damaged ice baskets over many years of operation.

3. Ice Basket Inspection Surveillance Procedure

This procedure lacked a requirement to inspect the accessible areas of the lower ice basket and consequently the licensee staff missed identification of potentially detrimental damage on an ice basket.

4. Ice Condenser Lower Inlet Door Surveillance Procedure

The acceptance criteria for ice condenser doors lacked margin to TS limits.

5. Ice Condenser Intermediate Deck Door Surveillance Procedure

The acceptance criteria for ice condenser doors lacked margin to TS limits.

B Corrective Action Program Breakdown for the Ice Condenser.

- 1. The licensee failed to implement prompt corrective actions for ice basket sheet metal screws found repetitively since 1991 in the ice melt cleanup system filters for Unit 1 and Unit 2.
- 2. Missing ice segments from the lower sections of ice baskets had not previously been identified or evaluated by the licensee with respect to minimum ice inventory and may represent an unanalyzed condition for past plant operation.
- 3. Dented/buckled webbing on over 40 Unit 1 and over 100 Unit 2 ice baskets had not been previously identified or evaluated by the licensee with respect to basket design loadings and may represent an unanalyzed condition for past plant operation.
- 4. Nonencapsulated fiberglass insulation found in ice condenser bays had not been previously identified or evaluated by the licensee with respect to potentially clogging ECCS strainers and may represent an unanalyzed condition for past plant operation.
- 5. Licensee corrective actions previously taken as a preventative measure for loose U-bolt nuts did not prevent recurrence.
- 6. Inconclusive root cause determinations and corrective actions previously taken for separated ice baskets were not adequate to prevent recurrence.
- 7. Licensee corrective actions completed in 1992 for failed fillet welds at ice basket bottom hold down bar were limited and did not adequately identify the full scope of problem.

C Maintenance of the Design Basis Program Breakdown

1. The licensee failed to update and maintain the ice condenser design basis analysis and description (Appendix J and M) of the FSAR submitted in application of the original operating license. Seven examples of this problem: two analysis affecting the ice condenser, a change in the form of ice from the FSAR description, a change in the bottom ice basket hold down bar assembly, two modifications to the ice basket design, and short ice basket assemblies used for replacement ice basket construction
2. The licensee authorized and implement modifications and changes to ice basket cruciform supports in the ice condenser surveillance procedure, which is outside the established design control and modification process.
3. Changes (bolts vice clevis pins, rivets vice screws and sheet metal) were identified on three Unit 1 ice baskets and two Unit 2 ice baskets, which had been installed without using the modification process and may represent an unanalyzed.

D. Potential Generic Part 21 Reportability Issue

During a visual examination of a D.C. Cook ice condenser basket, the fillet welds that connect the ice basket support bar to the ice basket bottom ring assembly were found to be separated. After a VT of 100% of the basket assemblies, a total of 22 end assemblies in Unit 1 and 3 end assemblies in Unit 2 were found to be in the above condition. The original welds were welded with the gas metal arc process in accordance with AWS D1.1-72. Westinghouse had LAMCo Industries, Inc., fabricate the original baskets in 1974. The support bar was welded inside the bottom ring fabricated from 12 gauge sheet metal. The bar had good weld fusion, but the 12 gauge sheet metal was not fused. Galvanizing material was on the weld and the sheet metal where the weld and metal were to be fused. The presence of galvanizing material in this area indicated that the unfused welds were manufacturing defects and not serviced induced.