

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/84-24(DRS)

Docket No. 50-461

License No. CPPR-137

Licensee: Illinois Power Company  
500 South 27th Street  
Decatur, Illinois 62525

Facility Name: Clinton Nuclear Power Station, Unit 1

Inspection At: Clinton Site, Clinton, Illinois

Inspection Conducted: August 20, 27, 29, September 4, and  
October 1, 1984.

Inspector(s): *J. M. Jacobson*  
J. M. Jacobson

*10/17/84*  
Date

Approved By: *D. H. Danielson*  
D. H. Danielson, Chief  
Materials & Process Section

*10/17/84*  
Date

Inspection Summary

Inspection on August 20, 27, 29, September 4, and October 1, 1984 (Report No. 50-461/84-24(DRS))

Areas Inspected: Routine announced safety inspection of quality records, procedures, and welding activities for containment vessel rework, review of quality procedures and welding activities for structural work, investigation of potential 10 CFR 50.55(e) concerning structural concrete embed failure. The inspection involved a total of 32 inspector-hours onsite by one NRC inspector.  
Results: No items of noncompliance or deviations were identified.

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## DETAILS

### 1. Persons Contacted

#### Illinois Power Company (IP)

W. Connell, Manager QA  
\*E. Kant, Director, Nuclear Safety  
J. Spencer, Director, Design Engineering  
M. Pacy, Program Coordinator - Piping/Mechanical  
\*J. Sprague, QA Specialist

The inspector also contacted and interviewed other licensee and contractor employees.

\*Denotes those attending the exit interview.

### 2. Licensee Action on 10 CFR 50.55(e) Items

(Open) 10 CFR 50.55(e) (461/83-10-EE): Indications on containment dome liner plate. The "Results of Engineering Review of Containment Liner Dome" 1605-L, letter Y-21747 was reviewed, reference NRC Report No. 50-461/84-23. This engineering review was carried out in response to an unacceptable weld condition identified by the NRC inspector. The review found 14 additional areas which required reinspection by an AWS Certified Weld Inspector. After grinding and cleaning these areas, three were found to require weld repair. Nonconformance Report Numbers 21836, 21837, and 21838 were issued to effect repairs. Examination and testing results will be reviewed upon completion.

Nonconformance Report Number (NCR) 20294 along with the "Designers Disposition" was reviewed for technical content. This NCR was generated due to unauthorized and improper grinding technique on the R2-R3 weld seam, identified by the NRC inspector. The repair instructions and Baldwin welding procedure N-1-1-A-1L were found to be acceptable. The in-process repair was observed and found acceptable.

Illinois Power Quality Assurance Surveillance Report dated August 24, 1984, covering work performed on this repair from August 29 thru September 5, 1984, was reviewed and found acceptable.

The "Repair Procedure for Crack in Containment Dome Liner" dated August 23, 1984, was reviewed for technical content and found acceptable. The vacuum box testing of this repair was witnessed on October 1, 1984, and found to be acceptable.

### 3. Illinois Power Overinspection Program

The Illinois Power Quality Assurance Instruction QAI 710.23, Revision 1 was reviewed for technical content. This procedure provides criteria and checklists for the Welding Overinspection program. During the review, it was noted that arc strikes and lack of fusion were acceptable under certain conditions. Where fillet welds are longer than that specified by design, lack of fusion at the start and stop of the weld was considered acceptable.

This inspection attribute as well as the allowance of small arc strikes is contrary to the AWS D1.1 Structural Code. Exceptions to the AWS Code are allowed per the Clinton Power Station FSAR provided through engineering evaluation. The inspector attended a meeting at the Clinton site on August 27, 1984, with Illinois Power and Sargent and Lundy representatives to review the engineering justification for these exceptions to the Code. After reviewing the engineering justification presented by Sargent & Lundy, the inspector informed the attendees that the justification for allowing lack of fusion was unacceptable. The inspector pointed out that although a fracture mechanics approach does allow for small lack of fusion defects, the length of lack of fusion when detected at the end of a fillet weld is indeterminate.

The licensee agreed to revise the lack of fusion attribute to coincide with that of the AWS Code. On the issue of arc strikes, Sargent & Lundy presented the AISC Manual of Steel Construction recommendations. The AISC Manual states that inadvertent arc strikes on members subject to critical fatigue stress conditions should be removed. The analysis presented showed that critical fatigue conditions do not exist in the structures examined by this program. The inspector agreed that arc strikes were acceptable per the checklist restrictions.

It should be noted that these comments apply only to the overinspection and field verification effort. The first line inspection procedure BTS-405 does not allow lack of fusion or arc strikes per AWS D1.1.

This program area requires review and evaluation of the pending Quality Assurance Instruction revision and is considered an unresolved item (461/84-24-01).

#### 4. Nelson Stud/Embedment Failure

On August 28, 1984, the Region III Office was notified by Illinois Power of a potentially reportable construction deficiency concerning a Nelson Stud to embed plate failure. The inspector traveled to the site on August 29, 1984, to examine the failed embed.

Concrete had been chipped away from the edge of the embed located at elevation 753', A2, 130°, to perform cosmetic repairs. Upon exposing the edge of the embed, it was found that 6 of 7 visible Nelson Studs had been pulled away from the embed plate. A similar plate was excavated at Azimuth 140° and found to have 2 of 4 visible Nelson Studs failed. It should be noted that one of the two still intact had been welded by the shielded metal arc method as opposed to the stud welding technique. There are 5 total similar embed plates at elevation 753', all were supplied by Rockwell Engineering.

Four structural connections attached to the plates had been modified due to design changes. These required large (7/8") fillet welds to be placed near the plate edge. It is believed that a combination of weld shrinkage and weld location caused the failure. Illinois Power is currently investigating the failures and will issue a report.

This program area requires further review and evaluation pending the licensee investigation report and is considered an unresolved item (461/84-24-02).

5. Unresolved Item

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of non-compliance, or deviations. Unresolved items disclosed during the inspection are discussed in Paragraph 3 and 4.

6. Exit Interview

The inspector met with site representatives (denoted in Persons Contacted) at the conclusion of the inspection and summarized the scope and findings noted in this report.