

Iowa Electric Light and Power Company

July 25, 1988

NG-88-2311

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Duane Arnold Energy Center
Docket No. 50-331
Op. License No: DPR-49
Response to NRC Bulletin 87-02, Supplements 1 and 2,
"Fastener Testing to Determine Conformance with Applicable
Material Specifications"

Reference: 1) NRC Bulletin 87-02, Supplement 1, dated April 22, 1988
2) NRC Bulletin 87-02, Supplement 2, dated June 10, 1988
3) Letter from W. Rothert (Iowa Electric) to A. Bert Davis
(NRC), dated January 15, 1988 (NG-88-0002)

File: A-63, A-101a

Dear Sir/Madam:

The purpose of this letter is to provide information to the NRC staff as requested in References 1 and 2. In the referenced NRC Bulletins, the staff requested that we provide a list of suppliers and manufacturers from which safety-related and non-safety-related ferrous fasteners may have been purchased. The attachments to this letter provide the requested information.

Please note that the Iowa Electric Light and Power Company Quality Assurance Program does not require maintenance of records concerning non-safety-related purchases and complete and accurate records do not exist. Therefore, the information provided in Attachment 2 is derived from a review of purchase orders for the past five years and is not complete; it represents our best effort to identify suppliers and manufacturers from which non-safety-related fasteners have been obtained.

In our response to Item 6 of NRC Bulletin 87-02 (Reference 3), we stated that further mechanical testing of three non-safety-related fasteners would be performed. A summary of the test results is given in Attachment 3.

Should you have any additional questions or concerns regarding this submittal, please contact this office.

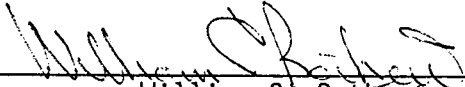
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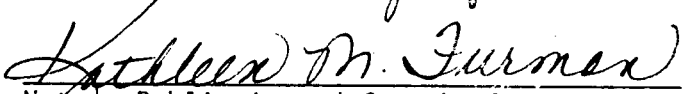
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This submittal is true and accurate to the best of my knowledge and belief.

IOWA ELECTRIC LIGHT AND POWER COMPANY

By 
William C. Rothert
Manager, Nuclear Division

Subscribed and sworn to before me on
this 25th day of July, 1988.


Notary Public in and for the State of Iowa

WCR/NKP/pjv+

Attachments: 1) List of Safety-Related Fastener Suppliers and Manufacturers
2) List of Non-Safety-Related Fastener Suppliers and Manufacturers
3) Testing Summary

cc: N. Peterson
L. Liu
L. Root
R. McGaughy
A. Bert Davis (NRC-RIII)
NRC Resident Office
J. R. Hall (NRC-NRR)
Commitment Control No. 880027, 880143, 880144, 880230

LIST OF SAFETY-RELATED FASTENER SUPPLIERS AND MANUFACTURERS

Bergen-Paterson Pipe Support Corporation

74 Commerce Way
P. O. Box 4011
Woburn, MA 01888

Cardinal Industrial Products Company

3873 West Oquenda
Las Vegas, NV 89118

Energy Steel and Supply Company

27 Paldan Drive
Auburn Hills, MI 48057

Hilti, Incorporated

5400 S. 122nd East Avenue
Tulsa, OK 74121

REC Corporation

6 Sheraton Plaza
New Rochelle, NY 10801

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Hilti, Incorporated

5400 S. 122nd East Avenue
Tulsa, OK 74121

Fastenal Company

511 8th Avenue SE
Cedar Rapids, IA 52401

TEST SUMMARY

1. Specimen DAEC-Y-22 (Non-safety-related bolt) was found to be out of specification for hardness. Its hardness was 234 (Brinell) and the specification range is 253-319 (Brinell). All chemical characteristics were within specified limits.

This bolt, believed to be an SAE Grade 5, was determined through destructive testing to possess 93% of its required specification ultimate strength (112 ksi vs. 120 ksi), and 97% of its required specification yield strength (89.8 ksi vs. 92 ksi). Elongation and Reduction of Area values exceeded the specification, indicating good ductility. This bolt would have possessed a factor of safety of approximately 3.7 against breakage when torqued in accordance with existing repair procedures. Therefore, this bolt is judged to have been suitable for non-safety related applications.

2. Specimen DAEC-Y-38 (5/8 inch Non-safety-related nut) was found out of specification for Carbon content. The measured content was 0.35% and the specified minimum is 0.40%. All other characteristics were within specified limits.

This nut, believed to be ASTM A-194, Grade 2H, heavy hex, was determined through testing to have met a proofload of 34,550 pounds without yielding. The proofload specified for testing was 5,000 pounds less than the ASTM specification value of 39,500 pounds, because approximately 13% of the nut's stress area had been removed to perform the chemical composition analysis required by NRC Bulletin 87-02. In a typical nut-bolt combination, it is the bolt that is considered the critical component, since it is subjected to both shearing and axial forces. If the nut had been undamaged, it would have been subjected to the full ASTM specified proofload of 39,500 pounds and, in our judgment, would have passed with no yielding. Therefore, this nut is judged to have been suitable for non-safety-related applications.

3. Specimen DAEC-Y-39 (3/4 inch non-safety-related nut) was found out of specification for hardness. Its hardness was 23 (Rockwell C) and the specification minimum is 24 (Rockwell C). All chemical characteristics were within specified limits.

This nut, also believed to be ASTM A-194, Grade 24, heavy hex, was determined through testing to have met a proofload of 58,400 pounds without yielding. The ASTM specification requirement is 58,450 pounds. The nut was undamaged in its stress area from the chemical composition analysis required by NRC Bulletin 87-02. The proofload test results were judged acceptable and the nut was not restressed for the sake of 50 pounds of load. Therefore, this nut was also judged to be suitable for non-safety-related applications.