

MEMO ROUTE SLIP		See me about this.	For concurrence.	For action.
* Form AEC-93 (Rev. May 14, 1947) AECM 0240		Note and return.	For signature.	For Information.
TO (Name and unit)	INITIALS	REMARKS		
RO Chief, FS&EB		Iowa Electric Light & Power Company		
RO:HQ (4)		Duane Arnold 50-331		
Licensing (4)	DATE			
DR Central Files				
Region I				
TO (Name and unit)	INITIALS	REMARKS		
Region II				
PDR				
Local PDR	DATE			
NSIC				
TIC				
TO: Bureau RO	INITIALS	REMARKS		
J. Rizzo, RO:HQ				
A/D for Info. Processing OOE				
OGC, Beth, P-506A	DATE			
FROM (Name and unit)	REMARKS			
D. M. Hunnicutt	Attached is licensee's adequate reply dated 11/7/73 to RO			
RO:III	Bulletin 73-5.			
PHONE NO.	DATE			
	10-9-74			

USE OTHER SIDE FOR ADDITIONAL REMARKS

GPO : 1971 O - 445-469

BN

IOWA ELECTRIC LIGHT AND POWER COMPANY

General Office
CEDAR RAPIDS, IOWA

November 7, 1973

C. W. SANDFORD
VICE PRESIDENT

IE-73-1372

Mr. James G. Keppler
Regional Director
Region III
U. S. Atomic Energy Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Re: Duane Arnold Energy Center #1
Subject: Control Blade Inspection
Ref.: AEC Letter Oct. 4, 1973 and RO Bulletin No. 73-5
File: A-110, Q-42

Dear Mr. Keppler:

This is in reply to your letter of October 4, 1973 regarding control rod blade inspection. This letter contains information in response to the reports requested in the attachment to your letter regarding (1) the inspection program and (2) the results of the program.

Between June and August of 1973 Iowa Electric conducted a control blade inspecting program which included the measures required in the referenced letter. Representatives of Iowa Electric were present at the Millstone Plant during the control blade inspection performed there. The experience of these IE personnel was utilized in developing the IE inspection program. This inspection program is now completed. Presented below is a discussion of the program and its results. Some of the information contained herein was included in our letter, IE-73-1208, of August 15, 1973.

Because of the ledge chamfer problem identified at Millstone, it was determined that the control blades then present at the DAEC should be returned to G.E. for further inspection and possible rework. The blades were returned to Wilmington in April of 1973. The information obtained by IE personnel present at Millstone was also used to evaluate the reinspection performed on these blades at Wilmington.

Following the return of the blades to DAEC from Wilmington, they underwent an inspection by G.E. site personnel. This G.E. site inspection rejected one blade due to lack of one B₄C rod. The G.E. inspection was checked via an IE initiated Program Q-302, "Control Rod Blade Inspection Program", to provide additional assurance regarding the adequacy of the General Electric inspection. Program Q-302 called for the inspection of a sample of 20 blades from the total of 89 various inspection attributes. These attributes included

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several classified as "significant" by the IE representatives who had been present at Millstone. If any of the significant attributes was out of specification, the program called for the inspection of all control blades. This inspection was performed on June 8, 1973.

As a result of the June 8 inspection, several control blades did not conform to drawings at the site in certain respects. These apparent non-conformities constituted deviations in significant attributes. On further investigation it was determined that the site drawing was not up to date because previously approved engineering change notices had not yet reached the site. Upon evaluation of the manufacturing drawing, as updated by the engineering change notice, the matter was resolved. No deviations in significant attributes were noted and all 89 control rod blades were accepted and installed.

Following receipt of the information from G.E. as to the inverted absorber tube problem on July 17, 1973, all blades were removed from the reactor and inspected under General Electric direction. The General Electric procedure called for preliminary examination by "stud finder" type magnetic indicator to establish possible rod reverse orientation. X-ray examination was used to verify absorber rod orientation. These films were reviewed by G.E. site personnel. Those blades in which the proper rod orientation was verified by the X-ray film were released by General Electric for reinstallation. As a result of the G.E. magnetic and X-ray inspection, 36 control rod blades were rejected.

The blades accepted by X-ray were then inspected by IE Inspection Program Q-302B by Iowa Electric personnel. Program Q-302B is similar to Q-302 except that all blades were inspected to selected attributes. The Q-302B Inspection was performed on August 8, 1973 and as a result 9 blades were rejected for reasons other than inverted absorber tubes. The G.E. magnetic and radiographic examination and the IE Q-302B examination rejected a total of 45 blades. Only 44 of the original 89 blades were released for reinstallation.

The 45 remaining control blade locations were filled by replacement blades shipped in from Wilmington, N. C. Radiographic films for each blade accompanied each shipment. After field review of these films by IE personnel, the blades underwent inspection by Inspection Program Q-302A, which is essentially similar to Inspection Program Q-302B. The blades were received in two shipments and inspected on August 7, 1973 and August 10, 1973. Installation of these 45 blades was completed by August 15, 1973.

Later, due to an identification problem, one blade was removed for inspection on September 11, 1973. As of September 11, 1973, on-site inspection records and radiographic films of absorber tube orientation for all 89 control blades in the DAEC reactor were on file.

As noted below, G.E. shipped 60 blades, of which 14 were rejected on site by IE, leaving one additional blade not required to complete the arrangement.

Of the original 89 blades, one was replaced by G.E. as a result of their inspection prior to June 8, 1973 for lack of one B₄C rod. Of the 89

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blades removed early in August, the 45 blades were rejected for the following reasons:

Blades on which G.E. "stud finder" examination indicated possible inverted absorber blades	23
Blades on which G.E. radiographic film indicated inverted B ₄ C rod or abnormal B ₄ C rod conditions	13
Blades on which IE visual examination identified out-of-specification conditions, including bent lifting bails, protruding tooling step, spot weld lacking, one tack weld missing on handle nut to rod, and marginal ledge chamfer	9
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Total of 89 installed blades replaced	45

It should be noted that the lifting bails are designed to bend instead of the blade and could have been bent during the extra handling operations the blade underwent as a result of inspection.

Of the 60 blades delivered to the site as replacements by G.E., 14 were rejected as a result of IE inspection for the following reasons:

Blades on which IE review of accompanying radiographic indicated questionable conditions, including bent B ₄ C rod, displaced or short B ₄ C rod, indentation in B ₄ C rod tubing, questionable end plug welding, possible faulty film and lack of radiograph	8
Blades on which IE visual examination noted the following questionable conditions, including bent lifting bail, sticky velocity limiter roller and questionable finish on hub radius	6
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Total blades rejected by IE inspection	14

It should be noted that some of the 9 blades from the original loading and 14 blades from the replacement shipment rejected for reasons other than inverted B₄C rods could have been accepted for installation upon rework or engineering review. As sufficient blades were available without considering the 23 blades, these blades were returned to G.E. at Wilmington for disposition.

If you desire additional information, please contact us.

Yours very truly,

C. W. Sandford
C. W. Sandford
Vice President

CWS:ar

c.c. Mr. L. Root	Mr. J. Miller
Mr. J. Ward	Mr. C. Darrow
Mr. G. A. Cook	Mr. J. Newman
Mr. G. G. Hunt	Mr. B. H. Grier