REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8612010114 DOC. DATE: 86/11/21 NOTARIZED: NO DOCKET #
FACIL: 50-331 Duane Arnold Energy Center, Iowa Electric Light & Pou 05000331
AUTH. NAME AUTHOR AFFILIATION
MCGAUGHY, R. W. Iowa Electric Light & Power Co.
RECIP. NAME RECIPIENT AFFILIATION
DENTON, H. Office of Nuclear Reactor Regulation, Director (post 851125

SUBJECT: Application to amend License DPR-49, modifying commitments to NUREG-0619, "BWR Feedwater Nozzle & Control Rod Drive Return Line Nozzle Cracking." Fee paid.

DISTRIBUTION CODE: A024D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
TITLE: OR Submittal: USI A-10 BWR Feedwater Nozzle Cracking

NOTES:

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
	BWR EB		1	1	BWR PD2 LA		1	0
	BWR PD2 PD	01	3	3	GILBERT, R		1	1
INTERNAL:	ADM/LFMB		1	0	NRR BWR ADTS		1	1
	NRR PWR-A ADTS		1	1	NRR BWR-B ADTS		1	1
	NRR/DSRO/EIB		1	1	REG FILE	03	1	1
EXTERNAL:	LPDR		1	1	NRC PDR	02	1	1
	NSIC	04	1	1				

w/check $150.00
No. 110820

TOTAL NUMBER OF COPIES REQUIRED: LTTR 15 ENCL 13

Iowa Electric Light and Power Company

November 21, 1986
NG-86-4125

Mr. Harold Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Request for Modification of Commitments to NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking"

Reference:
1) Letter, T. Ippolito (NRC) to D. Arnold (Iowa Electric) dated December 8, 1981
2) Letter, L. Root (Iowa Electric) to H. Denton (NRC) dated September 22, 1981 (LDR-81-264)
3) Letter, L. Root (Iowa Electric) to H. Denton (NRC) dated February 4, 1981 (LDR-81-42)

File: A-107c, A-286, A-402

Dear Mr. Denton:

The purpose of this letter is to request modifications to previous commitments made by Iowa Electric regarding implementation of the inspection schedules set forth in NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking".

During our review of Table 2 and Appendix D to NUREG-0619 and References 2 and 3, we discovered that there is a discrepancy between the requirements of the NUREG and commitments we made in the referenced letters. We contacted our NRC Project Manager and discussed the issue with him. Specifically, in our correspondence we equated the term "refueling cycle" with "once per year". For example, where NUREG-0619 specifies ultrasonic (UT) examination of the feedwater nozzles every two refueling cycles, we committed to performing the UT examination "every two years, during the outage".

w/check $150 no. 110920

A024
1/1

The advent of new General Electric fuel designs now allows boiling water reactors to operate on an 18-month cycle. We currently utilize this type of fuel and have submitted a proposed license amendment dated April 25, 1986 (NG-86-0364) which will revise the Duane Arnold Energy Center (DAEC) Technical Specifications to accommodate the longer operating cycle. However, our commitments concerning the inspection frequencies must also be revised in order to permit effective use of the new fuel design in the future; otherwise, the plant would have to be shutdown between refueling outages in order to perform the required inspections.

The attachment to this letter summarizes our commitments, describes our feedwater nozzle design, reviews results of previous examinations of feedwater nozzle and control rod drive return line and nozzle examinations which utilized various examination techniques and the radiation exposure accrued during the inspection activities.

We believe that the referenced correspondence and attached information demonstrates that we have met or exceeded the inspection intervals specified in NUREG-0619 and that we should follow the examination frequencies specified in that document. As inspection of the feedwater nozzles and control rod drive return line and nozzle requires a major planning and scheduling effort in advance of our mid-March refueling outage, we would appreciate your response to our request for modification of previous commitments by December 31, 1986.

In accordance with 10 CFR 170.12(c), a check for $150 is enclosed. The balance of the fee will be paid upon billing.

Should you require additional information, please feel free to contact me.

Very truly yours,

R. W. McGaughy

R. W. McGaughy
Manager, Nuclear Division

cc: M. Grim
L. Liu
L. Root
R. Gilbert
NRC Resident Office

ATTACHMENTS:
1) BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking
2) Check No. 110820

Iowa Electric Light and Power Company
Duane Arnold Energy Center
Docket No.: 50-331
Operating License No. DPR-49

BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking

Presented below is a summary description of the modifications which brought the DAEC into compliance with the requirements set forth in NUREG-0619. We intend to follow the inspection frequency for the feedwater nozzle, control rod drive return line (CRDRL) and CRDRL nozzle which is described in Table 2 and Appendix D of NUREG-0619. We request that the NRC staff review the following information and concur with our decision to follow the inspection requirements of the NUREG document.

Feedwater Nozzles

The Duane Arnold Energy Center (DAEC) feedwater nozzle design is such that the nozzle thermal sleeve is welded to the nozzle safe-end. During our 1977 outage, General Electric performed extensive tests on the feedwater nozzles and spargers to determine the thermal cycles at various power levels.

General Electric found that, because of the DAEC's unique thermal sleeve design, thermal cycling of the feedwater nozzle area does not occur to the same extent as in other boiling water reactors (BWRs) and nozzle cracking (due to fatigue) was not predicted to occur within the life of the plant. The results of the test were included in the GE document NEDC-23677 dated September, 1977. Copies of the test results were submitted to the NRC on November 14, 1979 (Reference: Letter, Larry Root (Iowa Electric) to Thomas Ippolito (NRC), LDR-79-292).

Table 1 of this Attachment lists the types and frequencies of examinations required by NUREG-0619. In addition, Table 1 shows that since the beginning of ultrasonic (UT), dye-penetrant (PT) and visual (VT) examinations at DAEC, no reportable indications have been detected. It should be noted this inspection is performed by either a NDE Level II or NDE Level III examiner and that the 1985 UT inspection was performed by EPRI-certified examiners for intergranular stress corrosion cracking (IGSCC). Furthermore, the DAEC has undergone 8 startup/shutdown cycles since 1983 which is well below the 60 startup/shutdown cycles after which a routine PT examination is specified in Table 2 of NUREG-0619.

Control Rod Drive Return Line (CRDRL) and CRDRL Nozzle

In Reference 3, we described our implementation schedule to meet the requirements of NUREG-0619. In that letter, we stated that "the 2-1/2 feet of 304 stainless steel line connected to the CRDRL nozzle safe-end will be ultrasonically inspected for intergranular stress corrosion cracking (IGSCC). This pipe section will remain part of the yearly Inservice Inspection (ISI) program". Appendix D to NUREG-0619 specifies that the CRDRL be inspected once every refueling outage in accordance with the methods and inspection techniques of NUREG-0313, Revision 1.

Table 2 of this Attachment lists the types and frequencies of examinations required by NUREG-0619. In addition, this table shows that since the beginning of ultrasonic (UT) and dye-penetrant (PT) examinations, no reportable indications have been detected. It should be noted that this inspection is performed by either a NDE Level II or NDE Level III examiner and that the 1985 UT inspection was performed by EPRI-certified examiners for IGSCC. Furthermore, the DAEC has undergone only 8 startup/shutdown cycles since 1983 which is well below the 60 startup/shutdown cycles after which a routine PT examination of the CRDRL nozzle is specified in Table 2 of NUREG-0619.

Radiological Consequences of Inspection

We have reviewed the historical radiological data pertinent to inspections of the feedwater nozzles, CRDRL and CRDRL nozzle at DAEC. We believe these data accurately reflect the conditions which will be encountered if inspection is required during our upcoming refueling outage.

Since examination involves extensive time in the reactor vessel cavity, the in-vessel radiation shield system would be utilized. Even with the shielding system in place, workers would be subjected to general area dose rates of 1.5 R/hr. Contact readings on these areas, after decontamination hydrolasing, are approximately 5 to 6 R/hr. Quality Control personnel performing the dye-penetrant tests can be expected to accrue a cumulative dose of approximately 10 man-rem. At this rate, assuming all work would take place during one calendar quarter, and all inspectors had 2 rem of exposure available, we would utilize the available dose of 5 persons. Preparation of weld surfaces would entail an additional cumulative dose of approximately 40 to 50 man-rem; thus utilizing the available dose of at least 20 persons. In total, the examination effort would approach or meet the radiation dose limit of 25 persons. From an ALARA standpoint, it will require an extensive planning effort just to assemble the proper work force to prepare the areas for inspection. It is anticipated that preparation and inspection of the feedwater nozzles, CRDRL and CRDRL nozzle will involve an accumulated exposure of approximately 60 man-rem.

Conclusion

Based upon the unique design of our feedwater nozzles, previously implemented modifications (see Reference 3), the low number of startup/shutdown cycles experienced at the DAEC, results of previous ultrasonic, dye-penetrant and visual examinations and the qualifications of the examiners and the radiation exposure received by personnel during inspection activities, we request that the NRC staff concur that inspection of the feedwater nozzles and control rod drive return line (and nozzle) be performed in accordance with the inspection frequency described in NUREG-0619. Furthermore, due to the reasons outlined above, and the fact that previous inspections met or exceeded the inspection frequencies set out in NUREG-0619, the next inspections shall be performed during the Cycle 9/10 (Fall 1988) refueling outage and in accordance with Table 2 and Appendix D of NUREG-0619 thereafter. The only exception to our request is that the 2-1/2 foot portion of the CRDRL pipe will be inspected during the mid-March 1987 refueling outage and each refueling outage thereafter.

TABLE 1

FEEDWATER NOZZLE INSPECTION INFORMATION

TYPE OF EXAMINATION	AREA	NUREG-0619 REQUIREMENT	IOWA ELECTRIC COMMITMENT	INITIAL START DATE OF INSPECTION	LAST INSPECTION	STARTUP/SHUTDOWN No.OF CYCLES SINCE LAST INSPECTION	NEXT SCHEDULED INSPECTION (PER IELP COMMITMENT)
UT	FW Nozzle	Once every 2 Cycles	Every 2 Years	1977*	1985*	6	1987
PT	FW Nozzle	Once every 4 Cycles	Every 4 Years	1983	1983*	8	1987
VT	FW Spargers	Once every 2 Cycles	Every Outage (Once per Year)	1983	1985*	6	1987

* No Reportable Indications found since start date of Inspections

NOTE: 1985 ultrasonic (UT) examinations were performed by EPRI-certified examiners for IGSCC detection.

TABLE 2

CRDRL AND CRDRL NOZZLE
INSPECTION INFORMATION

TYPE OF EXAMINATION	AREA	NUREG-0619 REQUIREMENT	IOWA ELECTRIC COMMITMENT	INITIAL START DATE OF INSPECTION	LAST INSPECTION	STARTUP/SHUTDOWN No.OF CYCLES SINCE LAST INSPECTION	NEXT SCHEDULED INSPECTION (PER IELP COMMITMENT)
UT	CRDRL (2-1/2'SS pipe)*	Once every Cycle	Once per year	1975**	1985	6	1987
PT	CRDRL Nozzle (inside PT & Nozzle on RPV wall)	Once every 4 Cycles	Once every 4 Years	1983	1983**	8	1987

* Inspected in accordance with methods, techniques and examiner certification requirements of NUREG-0313, Rev. 1.
** No reportable indications found since start date

NOTE: 1985 CRDRL ultrasonic (UT) examinations were performed by EPRI-certified examiners for IGSCC detection.