# U.S. NUCLEAR REGULATORY COMMISSION REGION I

Report No. 50-298/85-12

Docket No. 50-298

License No. DPR-46

Priority -

Category C

Licensee: Nebraska Public Power District P. O. Box 499 Columbus, Nebraska 686601

Facility Name: Cooper Nuclear Station

Inspection At: Brownsville, Nebraska

Inspection Conducted: March 11-22, 1985

Inspectors:

Kerch Mechanical Engineer Technician ample

Randy M. Campbell, NDE Technician

Approved by:

. Durr, Chief acque P ngineering Branch, DRS

9-5-85 date 4-5-85 date

4-5-85 date

Inspection Summary: Inspection Conducted March 11-22, 1985 (Report No. 50-298/85-12)

<u>Areas Inspected</u>: A special, announced inspection utilizing the NRC Mobile NDE Van to perform nondestructive examination of replacement pipe on the reactor recirculation system. Three regional based inspection personnel assisted by two contracted NDE personnel were utilized during this inspection. The inspection involved 454 onsite hours and 224 hours in the Region I offices.

<u>Results</u>: One (1) violation was identified as a result of this inspection, failure to identify and disposition a linear indication in an ASME III Code, Class I weld.

B505210311 850516 PDR ADUCK 05000298

# DETAILS

#### 1. Persons Contacted

# Nebraska Public Power District

L. Kohles, Project Manager, IGSCC

R. E. Wilbur, Division Manager Nuclear Services

D. A. Whitman, Technical Staff Manager

U. L. Wolstenholm, Quality Assurance Manager

J. M. Meacham, Technical Manager

E. M. Mace, Plant Engineering Supervisor

\*P. V. Thomason, Division Manager Nuclear Operations

- F. Shaaf, Technical Supervisor (CM)
- \*G. Horn, Construction Manager (CM)
- C. Goings, Regulatory Compliance Specialist

### Chicago Bridge and Iron

L. R. Lucas, Site Manager L. R. Shockley, ARRA Weld, Quality Assurance Manager

#### USNRC

D. DuBois, Senior Resident Inspector

\*Denotes those present at entrance and exit meeting.

2. Independent Measurements - NRC Nondestructive Examination and Quality Records Review of Safety Related System

During the period of March 25 through April 5, 1985 quality records received from Cooper Nuclear Power Station were reviewed in the regional office for completeness and compliance to the licensee's FSAR commitment to applicable codes, standards and specifications.

An onsite independent verification inspection was conducted during the weeks of March 11 through March 22, 1985 using the NRC Mobile NDE Van. This inspection was conducted by regional based personnel in conjunction with NRC contract personnel. The purpose of this examination was to verify the adequacy of the licensee's welding quality control program during replacement of the Recirculation System piping. This was accomplished by duplicating those examinations required of the licensee by the regulations and evaluating the results. These test results were then compared to the licensee's quality assurance records for completeness, accuracy and correlation.

An NRC inspector made a selection of pipe weldments which provided a representative sample of the recirculation piping system replaced by the licensee. The selection represents various pipe sizes, shop and field weldments fabricated to ASME Class I Component requirements. The items selected were previously accepted by the licensee based on vendor shop and onsite QA/QC records. This special inspection was scheduled to inspect replacement piping in the RHR and recirculation loop systems. The existing pipe that was replaced had (during plant operation) deteriorated from Intergranular Stress Corrosion Cracking (IGSCC).

2.1 Quality Documents Review

Six safety related piping system document packages were reviewed for compliance with licensee procedures, applicable codes and standards and regulatory requirements. The following types of documents were reviewed.

Document	Attributes Reviewed
Material Certification	Base material chemical and physical properties were compared to standards and code requirements
NDE Records	Examinations meet codes and standards, licensee procedures and other commitments; personnel properly qualified; appropriate examinations performed
Fabrication Records	Fabrication travelers and records were reviewed and compared against other corresponding records and sign off sheets
Drawings (isometrics)	Drawings were reviewed for proper desig- nation of weldments, location and class- ification
Procedures	Procedures were reviewed for complete- ness, and licensee's commitment to code requirements
Welding Material	Material certifications for welding materials were reviewed for physical and chemical properties as required by licensee's commitment to code and industry standards
The document packages revi	ewed are listed in Attachment 3.

Results: No violations were identified.

# 2.2 Nondestructive Examinations

Examinations were performed using NRC procedures with addenda written specifically for compliance to the licensee's FSAR commitment. The intent was to duplicate, to the extent possible, the techniques and methods used during the original examination.

The following examinations were performed:

#### Radiographic Examination

Seventeen pipe weldments were radiographically examined per NRC procedure NDE-5, Rev. 0, addenda CS-1-5-1. These weldments were located in the RHR and Reactor Recirculation System.

Results: No violations were reported.

#### Liquid Penetrant Examination

Fifteen ASME Class I pipe weldments and adjacent base metals were examined per NRC procedure NDE 9, Rev. 0, addenda CS-1-9-1.

Results: No violations were identified.

#### Visual Examination

Twenty-five pipe weldments and adjacent base materials were examined for weld reinforcement, surface condition and overall workmanship per NRC procedure NDE-14, Rev. 0.

Results: No violations were identified.

#### Thickness Measurement

Eight pipe weldmerts and adjacent base material were examined per NRC procedure NDE-11, Rev. O using a NORTEC NDT thickness gauge model 120. Minimum wall thickness was determined based on ASTM standard pipe sizes and nominal thickness chart.

Results: No violations were identified.

#### Ultrasonic Inspection

Two weldments were ultrasonically inspected to verify compliance to ASME Section XI requirements using NRC procedures NDE-1 and NDE-2 Rev. 0. The two welds inspected were scanned axially and circumferentially using a Sonic Mark I ultrasonic flaw detector.

Indications observed on the (CRT) Cathode Ray tube were intermittant approximately 360° with an amplitude of 15% to 20% of the Distance Amplitude Curve (DAC). These indications were determined to result from acceptable geometric reflectors.

Calibration was performed using the General Electric calibration standard.

No violations were identified.

# 2.3 Review of Procedures

The following procedures were reviewed for compliance with NRC and ASME code requirements.

# Nondestructive Examination

CBI)	MT11X	Rev.	1	
	VT1X	Rev.	5	
	PT14X	Rev.	3	
	RT9X	Rev.	3	
	RT1X	Rev.	1	

(IHI) RT611K204

(GE)	AIUP-W812	Rev. O (Automatic UT)	
	IPW812	(Liquid Penetrant)	
	MTUPW818	(Manual-UT)	
	QC-2	(Qualification NDE Personne	1

A review of the GE PSI program disclosed that changes and additions to the PSI/ISI program are not systematically controlled. In response to the inspectors' review, licensee personnel stated that when they became aware of any changes they would be incorporated; however, no written procedures were available to govern how changes and additions to the PSI/ISI program were to be incorporated. This is considered unresolved pending a formal method of incorporating changes to the PSI/ISI program is developed and reviewed by the NRC (298/85-12-01).

### 3.0 NDE Personnel Qualification

The NDE qualification and certification records of thirty-nine Chicago Bridge and Iron inspectors and six General Electric inspectors were reviewed. Records were reviewed for compliance to SNT-TC-1A and ASME Criteria.

# 4.0 Radiographic Review

A sampling of licensee's radiographs were reviewed to determine the compliance of the nondestructive examination program to ASME III Code requirements.

The inspector reviewed twenty-four field welds and thirteen shop welds to verify accurate interpretation and the adequacy of the licensee's radiographic program (see attachment 2). Listed below are the findings.

#### 4.1 Shop Weld-Specific

Weld RL-A-15 (SW-1) has a joint design that does not lend itself to examination. During the design review for the replacement pipe this weld joint configuration should have been changed. Radiographs by the vendor are as good as obtainable. This weld has not been ultrasonically examined as required by the site PSI program as of the date of this inspection. It appears that this weld cannot be fully examined to meet ASME Section XI requirements. This item is unresolved pending completion of the licensee's PSI program and review by the NRC (298/85-12-02).

#### 4.2 Shop Welds - Generic

During the review of vendor radiographs, the inspector was unable to determine how full radiographic coverage of the weld was obtained by the vendor. A review of the radiographic procedure and report disclosed that neither document explained how full radiographic coverage was achieved. The quality engineer that performed the vendor surveillance was contacted, and with his input the inspector was satisfied that ASME Section III requirements had been met. It was the inspector's understanding that the licensee will acquire this information to complete the records. The inspector had no further questions concerning these radiographs.

#### 4.3 Field Welds

The review of the radiographic program for field generated welds resulted in several findings which indicated that the program is only marginally adequate.

The licensee had only reviewed five of the completed welds at the start of this inspection. The ASME "N" stamp holder and the Authorized Nuclear Inspector (ANI) had accepted all of the completed welds that the NRC inspectors re-examined. The NRC review disclosed the following:

- a. Field weld N2H, film area 8-9½ has a linear indication that was not reported or dispositioned on the radiographic report. The "N" stamp holder, the ANI and the licensee had accepted this rejectable condition. The failure to record and properly interpret this radiographic indication is a violation of 10 CFR 50.55a, Piping System Installation Specification 84-2, Section G, Part I, and the ASME Section III 1983 Code (298/85-12-03).
- b. The following welds were accepted by the ANI and the "N" stamp holder but have not been accepted by the licensee's reviewer.
  - Field weld D2A, film area 5, has linear indication not reported or dispositioned on the radiographic report.
  - Field weld N2B, film area 1½ inches left of film area 1, has an indication not reported or dispositioned on the radiographic report. Film area 9 does not have proper coverage in the film overlap area.

- Field weld N2C, film area 10-11, has an indication not reported or dispositioned on the radiographic report. Only one film available for review, indication is in area of interest and could be a processing defect.
- Field weld D1B film area 21 has an indication not reported or dispositioned on the radiographic report.
- Field weld NIA has gross linear indications. These indications were accepted by the "N" stamp holder and the ANI, but were rejected by the licensee for unacceptable linear indications.

Based on the foregoing findings, it is obvious that the "N" stamp holders radiographic interpretation program is not performing satisfactorily. This item is considered unresolved pending further licensee evaluation and NRC review (298/85-12-01).

Other findings by the inspector, although technically acceptable by the governing code, may have contributed to the foregoing violation. These findings are listed below:

- The film interpreters are not clearly documenting their findings on the film interpretation sheels.
- The interpreters are using nonstandard terminology in reporting indications on the review sheets.
- The radiographic technique employs only one film per exposure. In the event of film artifacts, it may become impossible to properly disposition the film without a re-examination.
- The licensee's radiogrpahic program employes a large grain fast film in conjunction with a large source geometry. These factors combine to degrade sensitivity.
- The radiographic film is not tested for long term, archive quality storage.

The licensee took immediate steps to correct several of these items prior to the completion of the inspection. The inspector had no further questions concerning these matters.

# 5.0 Attachments

Attachment No., 1 is a tabulation of the specific welds examined and the results.

Attachment No. 2 is a list of specific radiographs reviewed and the results.

Attachment No. 3 is a list of specific documents reviewed.

# 6.0 Exit Interview

The inspector met with the licensee's representatives (denoted in paragraph 1) at the conclusion of the inspection. The scope and applicable finding of the inspection were summarized at this time. No written material was given to the licensee by the inspector during the course of this inspection.

# INDEPENDENT MEASUREMENT PROGRAM

Site: Cooper Nuclear Station Date: March 11 thru 22, 1985

Docket No: 50-298 Inspection No: 85-12

ICK   P.T.   R.T.   VISUAL	cc acc acc acc	cc acc acc acc	/A ACC ACC ACC	cc and acc acc	cc acc acc acc	CC N/A ACC ACC	A N/A ACC ACC						
THICK	A ACC	A ACC	A N/A	A ACC	A ACC	A ACC	A N/A						
SIZE I UT	12" N/I	12" N/	1/N 11/1	14 N/V	28" N/	28" N/I	28" N/I	12 <sup>m</sup> N/I	28" N/	28" N/I	12" N/I	28" N/I	IM Hac
BER II CLASS	-	-	-	1	-	+		-	-	-		-	
WELD NUM	LOOP A H3A	Loop B H3B	LOOP B N2B	Loop B N2C	51B	Loop A S3A	Loop A D2A	LOOP A R6A	Loop 8 D18	Loop B D2B	Loop A H4A	LOOP A STA	1 444 1

Attachment No. 1 Page 1 of 2

# INDEPENDENT MEASUREMENT PROGRAM

Site: Cooper Nuclear Station Date: March 11 thru 22, 1985

Docket No: 50-298 Inspection No: 85-12

WELD NUMBER	00P A 12H	000 A	000 A 12J	00P A 5A	000 A	00p B 68	000 A L-A-4	000 A 1L-A-9A M-1	000 A L-A-10A M-1	000 B L-8-9A W-1	000 B LL-B-10A M-1	000 8 1L-8-4 W-1
II CLASS	-	-	-	-	-	-	-	-	-	-	-	-
SIZE	141	28"	14 <sup>11</sup>	12"	28"	12"	12"	12"	12"	12"	12"	12"
UT	N/N	N/A	N/A	ACC	N/A	ACC	N/A	N/A	N/A	N/A	N/N	N/A
THICK	N/N	N/A	N/A	ACC	ACC	N/A	N/A	N/N	ACC	N/A	N/A	N/A
P.T.	ACC	N/A	ACC	ACC	N/A	ACC	N/A	N/A	ACC	N/A	N/A	N/A
R.T.	ACC	ACC	ACC	ACC	ACC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
I VISUAL	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC

Attachment No. 1 Page 2 of 2

# LICENSEE RADIOGRAPHIC FILM REVIEW

SYSTEM/LINE	WELD ID	ACC	REJ	I C	ISL.	P	TI	ILF	IIP	ILI	IUI	IA	IS	ICCI	CV	COMMENTS
Reactor	I D2A	Ind	icat	ion	fi	lm	are	a (	5)	not	di	spo	sit	ione	d	
Recirculation	1	1	1			1	1	1	1	1	1	1				
Chicago Bridge &	IN2B	lind	icat	ion	fi	lm	are	a (	0-1	) n	ot	dis	pos	itic	ne	đ
	N2H	-	X	-	1	1	1	X		+	+	1				Film Area 8-9
	N2C	Ind	icat	ion	fi	] ]m	area	a (	10-	11)	no	t d	ispo	osit	ioi	ned
пп	N2J	X				-	-		-	-	-					
ни	D1B	Ind	 icat	ion	fi	1 1m	area	L a (	21)	no	l t d	ispo	Dsit	Lion	ed	
<u>an</u>	H3A	   X		-	-	-	-		<u> </u>	-	-	-				
		İ X	<u>i</u>	į	<u> </u>	-	-		<u> </u>	<u> </u>	<u> </u>	-				
0.0	IN1B					<u> </u>			<u> </u>	1	-		_			
	1410		1.							1	1					
	N2	X				1			1	1	1					Repairs
	D2B	X		1						1	1					
	52CS-E	X				1				1	1					
ин	52CS-D	X								1						
0.0	5205-B	X								1						
	N2A	X													-	
	1N2	X									-				-	
- ни	S2B	X							-					-	-	
нн	S1B					Ļ.,							-	-	-	
0.0	R6A					-				-			-	+	-	
	IS3A	X						_					-	-+	-	
ин	I S2A							_		<u> </u>			-	-	-	
	IS1A	X			_					<u> </u>			-		-	
пп	INIA		X				H			<u> </u>		-	-1		-	Licensee
00	LH3B	X											-			Rejection
															-	
C - CRACK SL - SLAG P - POROSITY T - TUNGSTEN		LF - IP - LI - UI -	LACH INAC LINE	EAR USED	ISIC IATE INC	DN PI DIC/	ENET ATIO	RAT	101	N		A S CC CV	- A - S -	RTI URF/ CONI CONI	FAC ACE CAV VEX	TS ITY ITY

# LICENSEE RADIOGRAPHIC FILM REVIEW

SYSTEM/LINE	WELD ID	IACC	IREJ	C	SLI	PI	T	ILF	IP	ILI	IUI	A	SI	CCI	CV	1	COMME	NTS I
Reactor	RK-A-9A	X	1	1	1			1	1	1	1		1			1		1
IRecirculation		1								1				_		1		
ITHI CO.	IRL-B-9A	X								-				-				
1	RL-A-10A	X	1								1		1					
1 10	RL-B-10A	X																
1 wn	RWCU-2	X																
	RWCU-5	X															7.5	
1 111	RWCU-1	X				1												
<u> </u>	RL-A-15	Unat	ole t	to i	inte	rpr t d	et	a11	R	T v	iews	1	f t	1	1	ect	ion	
1	RL-A-7	X														Jecc	1011	1
1	IRL-B-7	X																
1 111	IRL-A-4	X																
1 110	IRL-B-4	X					-						1	-				
ни 1	RL-A-16	X																
								1					1					
					_	-	1					1		1	-			
															-			
								1					1	1	1			
						1	1	1	-				1					
							1											
						1						1						
1000						1												
						-												1
C - CRACK SL - SLAG P - POROSITY T - TUNGSTEN		F - IP - I -	LACK INAD LINE UNFU	FU EQU AR SED	SIO ATE IND	PEN ICA SER	NET	RAT	ION			A S CC	- AF - SL - C	RF/	FAC ACE CAV	TS ITY		
												Att	tach ge 2	men of	nt f 2	2		

SITE: Cooper Nuclear Station Inspection: 85-12 Docket: 50-298

.

REVIEW OF DOCUMENTATION PACKAGES

Comments				Nozzie Safe End 270°AZ	Nozzie Safe End 90°AZ	
Review	ACC	ACC	ACC	ACC	ACC	ACC
Weld No.	Н4А	НЗА	НЗВ	N2H	NZC	Н4В

Attachment 3 Page 1 of 1