Commonwealth Edison Company Quad Cities Generating Station 22710 206th Avenue North Cordova, II. 61242-9740 Tel 309-654-2241

ESK-96-049

April 4, 1996



U.S. Nuclear Regulatory Commission

Attn: Document Control Desk Washington, D.C. 20555

Subject:

Ouad Cities Nuc

ower Station Unit 1

Submittal of Weld Overlay Repair Designs and Flawed Pipe Evaluations

NRC Docket No. 50-254

References:

(a) USNRC Generic Letter 88-01 and Supplement 1

(b) NUREG-0313 Revision 2

The purpose of this letter is to provide ComEd's assessment of the indications detected in eight (8) Inter Granular Stress Corrosion Cracking (IGSCC) susceptible stainless steel weldments in the reactor recirculation piping system and to transmit the weld overlay repair designs and the flawed pipe evaluations. In addition, we have included our response to the NRC's questions from the April 1, 1996 teleconference between ComEd and the NRC.

Ultrasonic examinations (UT) on IGSCC susceptible weldments were performed during the current Q1R14 refuel outage and resulted in eight (8) welds with indications that exceed the acceptance criteria in IWB-3500 of ASME Section XI 1989 Edition. Subsequently, the weldments were evaluated using the methodology and acceptance criteria specified in IWB-3640 of ASME Section XI, 1989 Edition and/or were scheduled for weld overlay repairs during the current refuel outage. The repairs will consist of a "designed" weld overlay or a "standard" weld overlay in accordance with Reference (b). The flawed pipe evaluations concluded that a minimum of five (5) hot operating years remain prior to exceeding the allowable flaw size for "weldments evaluated for continued service". The Engineering Change Notices (ECN) and Engineering Calculations are included as Attachments 1 and 2.

#### Weldments Scheduled for Weld Overlay Repair During Q1R14

02AS-S6	A Recirc Pump Suction	ECN 04-01337M
02BS-S12 (1)	B Recirc Pump Suction	ECN 04-01333M
02AS-S12	A Recirc Pump Suction	ECN 04-01345M
02AS-F14	A Recirc Pump Suction	ECN 04-01344M
02AS-F2 (1)	A Recirc Pump Suction	ECN 04-01339M

#### Weldments Evaluated for Continued Service

02AD-F12	A Recirc Pump Discharge	Calculation #NED-P-MSD-088
02AS-S4	A Recirc Pump Suction	Calculation #NED-P-MSD-090
02BS-F14	B Recirc Pump Suction	Calculation #NED-P-MSD-092

<sup>(1)</sup> Weldment was evaluated as acceptable for continued service without repair.



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In addition, the following are responses to the questions that the NRC asked during the April 1, 1996 teleconference call between ComEd and the NRC.

- Question 1) Why were Category D welds not included in the sample expansion based on the results from Category C weld inspections?
- Response 1) Quad Cities Station has committed to perform IGSCC inspections in accordance to the rules of Generic Letter 88-01. The NRC Position on Sample Expansion, which is found on page 5 of the Generic Letter, only requires additional welds of the same IGSCC Category (Category A, B, or C) as that of the flawed welds be selected for any additional samples. Supplement 1 to Generic Letter 88-01, issued in February 4, 1992, provides clarification on the sample expansion rules applicable to IGSCC Category D welds. Supplement 1 does not discuss nor require a sample expansion to include welds in a different IGSCC Category than that of the flawed welds.

During the current refuel outage Q1R14, the Category C sample was expanded twice to include 100% of the Category C welds.

- What is the population of Category D Welds? Question 2)
- Response 2) The total population count for Category D welds in Quad Cities Unit 1 is seven (7) wilds. They are: 02A-S4, 02AB-S10A, 02AD-S5, 02BB-S10, 02BD-S5, 10HV-F1, and 10S-S3. These Category D welds are included in the original IGSCC UT sample for the current refuel outage, Q1R14.

In conclusion, per the requirements of Reference (a), ComEd requests NRC review and acceptance of a return to operating mode of Quad Cities Unit 1 at the end of the scheduled refueling outage. NRC acceptance is requested by April 27, 1996.

Please address any further comments or questions regarding this matter to this office.

Sincerely,

& Kraft & Site Vice President

Engineering Change Notices Attachments (1)

> Engineering Calculations (2)

H. J. Miller, Regional Administrator - RIII (without attachments) CC:

R. M. Pulsif ..., Project Manager - NRR

C. G. Miller, Senior Resident Inspector - Quad Cities Station (without attachments)

Office of Nuclear Facility Safety - IDNS (without attachments)

D. C. Tubbs, R. J. Sir e. MidAmerican Energy Company (without attachments)

Attachment 1

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VECTRA March 21, 1996 1598-00044,002

Mr. C. Conner Lead, ComEd Inspections Group Commonwealth Edison Company Quad Cities Nuclear Power Station 22710 206th Avenue North Cordova, IL 61242-9700

Subject:

Quad Cities Nuclear Power Station Unit 1 Weld Overlay Repair of Weldment 02BS-S12

Reactor Recirculation System, 0200

"For Construction" ECN Transmittal Letter

ECN No.: 04-01333M P.O.No.: 351285/YY-238 Function No.: 052306-3171

#### Dear Mr. Conner:

The purpose of this letter is to transmit "For Construction" the attached Engineering Change Notice (ECN) in accordance with Commonwealth Edison Company's Nuclear Engineering Procedures. The following information related to the ECN is provided:

1. SEC Cognizant Engineer: T. Wojcik

2. Modification Number: E04-1-96-023-A

List of ECNs Contained in Package:

ECN NO. DESCRIPTION

04-01333M Weld Overlay Repair of Weldment 02BS-S12 in

the Reactor Recirculation System.

4. Additional ECNs may be required to complete this modification. This ECN may be completed independently of any other work and is being issued as a part of partial modification E04-1-96-023-A to support the Station's outage schedule.



5. Required Hardware Procurement Action:

This modification does not require any inventory of spare parts. The materials are "Cobalt Free" (<1% Cobalt).

6. ECN Safety Classification:

The ECN is safety related.

7. Other Related, Open Design Changes:

ComEd Station Central File has been contacted and VECTRA has determined that no open DCDs are related to this modification.

- Fabrication of parts may proceed without the receipt of a ComEd approval letter. However, installation activities shall not proceed until a ComEd Authorization Letter is received.
- VECTRA requests that ComEd submit a DCR after the ECN is installed to update the affected design documents.
- Acceptance Criteria/Interfacing Requirements Operability Statement:

Examination and acceptance criteria shall be in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments," Latest Revision. This application document requires the measurement of weld overlay axial shrinkage which is used by Engineering to determine the state of sustained stress at unrepaired weldments in the system. The magnitude of sustained stress within a weldment is used to determine the weldment's NUREG-0313, Revision 2, inspection category/frequency. Changes in piping system stress due to weld overlay repairs in not considered an ASME BPVC load case.

11. Interdisciplinary Review:

An interdisciplinary review (IR) has been conducted on the "For Construction" ECN in accordance with VECTRA's Procedures.

12. Spare Parts List:

No spare parts are required.



- 13. Technical Specification/FSAR/UFSAR Document Review Verification.
  - List of Systems Involved:

Reactor Recirculation System 0200

Applicable Tech. Spec/FSAR/UFSAR Sections:

Tech. Spec. Sections 3.6/4.6 FSAR Section 4.3 UFSAR Section 5.4

b. Affects of PDC on Tech. Spec/FSAR/UFSAR Sections:

None

c. If no Tech. Spec/FSAR/UFSAR Sections affected, which Sections were reviewed:

See Item 14 (a)

d. Is PDC Installation Outage related?

Yes (X) No ()

Work may be conducted during the Q1R14 or later outage.

e. Is New Design Compatible with Existing System?

Yes. Weld overlay materials are compatible with the existing piping system. Welding shall be in accordance with ASME Sections IX, XI, and Document No. COE-107-500. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.

#### 14. Other Information:

a. Engineering Synopsis:

Examination of reactor recirculation system weldment 02BS-S12 at Quad Cities Unit 1 has identified intergranular stress corrosion cracking (IGSCC). To ensure the integrity of the weldment and the recirculation piping system, a weld overlay repair will be performed.



The weldment is located on the suction side of recirculation pump 1-0202B on line 1-0202B-28"-A. In order to permit weld overlay implementation, existing caps, originally used to cover core sample holes, will be removed and filled with flush plugs.

- b. This minor plant change shall be installed in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments", Latest Revision.
- c. Material requirements are specified in Document No. COE-107-500.
- d. All of the equipment and components associated with ECN 04-01333M are safety related. No other interferences or interactions with Safety or Class 1E equipment exist. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.
- e. No interfaces with other A/Es are required.
- 15. No engineering assumptions were used in preparing this ECN.

If you have any questions, please call Rob Choromokos or me at (708) 778-0100, or Carl Froehlich at (408) 629-9800.

Very truly yours,

James A. Brown, P.E.

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Project Manager

JAB/lab

Attachment



#### Copies:

S. Eldridge - Quad Cities MOD Design Supervisor - Letter only

T. Wojcik - Quad Cities SEC Cognizant Engineer - w/1 ECN package

M. Sullivan

Site Construction Superintendent - w/1 ECN package

M. Santic - Quad Cities

System Engineer - w/1 ECN package

T. Dismukes - Quad Cities

Station Central File Supervisor - w/2 ECNs & 1 Silver Aperture

A. Beveroth - Quad Cities

SEC DCR Coordinator - w/1 ECN package

G. J. Tagatz - Quad Cities

Design Change Coordinator - w/letter only

G. Bathje - Quad Cities

Materials Management Supervisor - w/1 ECN package

Bob Larken - Quad Cities

Site Construction - w/1 ECN package

NETS/CHRON System Supervisor

C. H. Froehlich - w/1 ECN Package

File: 1598-00044.D01 - Letter only

1598-00044.F09 - 1 ECN Package

DTR Book - Letter & ECN Parts 1 & 2

JAB-96-025



## ENGINEERING CHANGE NOTICE (Part 1)

ISSUANCE: [X] FOR CONSTRUCTION [] FOR COMMENT

ECN No. 04-01333M

Page \_ 1 of \_ 9 Station: Quad Cities [X] Safety Related Design Change No. PO4-1-96-023-A Affected Unit: 1 [ ] Non-Safety Related Project No. (if appl.) \_\_\_\_\_1598-00044 Changes to a previously Approved ECN [ ] [ ] Regulatory Supp ID No. (f appl.) N/A System: 0200 Description of Design Change Request: Weld overlay repair (WOR) of weldment 02BS-S12 on line 1-0202B-28" of the Reactor Recirculation System. Reason for Design Change: Change and action required (Provide reason for change, specific actions required, attach supporting documents, as applicable). A weld overlay repair will be applied to weldment 02BS-S12 on line 1-0202B-28" to repair intergranular stress corrosion cracking (IGSCC). INTERFACING COMMENTS by: Design Group or Discipline Name of Commenter (Printed) C or NC Signature of Commenter Date 3/21/96 Elect./I&C NC Mechanical NC Structural CHARLES E. PROKUSKI 3/21/96 NC Weld & Matl. JAMES A. BROWN Others Review by Holes Choromo los c ortho Prepared by: Tork by weigh Approved by: 2 4/5 Approved by: 3/21/96 Date: 3/21/96 Date: 3-21-96 All affected design documents revised by (date):\_\_\_\_ Verified by:\_\_\_\_ Date:\_\_\_\_

# DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST (Part 2)

Asso	ciated Wit	h:		DCD N	lumber		04-01333	3M	
	ECN -	Comment		Station	Qu	ad Ci	ties	Unit: _1	
	ECN -	Construction		Plant D	esign (	Chang	e/Change	Authority:	
	FCR					Туре	:	EPC	
	Other:					Num	ber:B	04-1-96-023-A	
Part 1 - Ger	Part 1 - General Information - Optional for FCR				repared		3/16/96		
A/E:VO	06_ Proj	ect No.:15	98-00044					52306-3171	
Originator: Siegel, K.				Organia	zation:			VECTRA Technol	ogies
				_ Phone	No./Ex	t:		(708) 778-42	66
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1 2 3 4 Control Ro					6. 7. 8.		s Affected		
		N DOCUMEN			C /	F /	Crit. Drwg.	Related DCDs (Ref # from	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date	R*	D *		Part 2)	
DWG-C	C502	M-3103	3	Е	3	D			
					-		-		

<sup>\*&#</sup>x27;C' for Construction or 'R' for Record

## Back-Up Calculation Listing (Part 2)

ECN No. 04-01333M

Design Change No.: E04-1-96-023-A

Page 3 of 9

Calculation/Analysis No.

Revision No.

Description

XCE042.0322

0

Weld Overlay Repair Design for Quad Cities Unit 1, Weld 02BS-S12 - 1996

Outage

Reproduced from: NEP-08-01, Issued 9/30/94

### **CERTIFICATION PAGE**

(Part 3)

ECN No. 04-01333M

Design Change No.: E04-1-96-023-A

Page 4 of 9

Station:	Ouad Cities	Affected Unit:	1 Page: 1	_ of _1_
	CERTIFICATION OF ECN I	NO. <u>04-01333M</u>		
	I certify that this Engineering and I am a registered Profess	Change Notice was prepional Engineer under the	eared by me or under my so laws of the State of Illinois	upervision s.
	Certified by:	Br		
			Seal PROFESSION ENGINEE OF	BD NAL

### SUPPORT INFORMATION (Part 4)

ECN No. 04-01333M Design Change No.: E04-1-96-023-A Page 5 of 9

### 4.1 General

Note No.	Description
4.1.1	Core sample plug repairs shall be in accordance with Section 4.2 of Part 4 of this ECN.
4.1.2	Weld overlay application shall be in accordance with page 9 of this ECN (Sketch 1598-00044.010-0207) and shall comply with the technical requirements contained in Document No. COE-107-500, Latest Revision.
4.1.3	Detailed joint configuration information and thickness data shall be reported to Engineering prior to application of the overlay.
4.1.4	During weld overlay implementation, the "as-built" configuration shall be recorded on a Weld Overlay Data Sheet as specified in Document No. COE-107-500, Latest Revision.
4.1.5	The base materials to which this WOR is to be applied contain low levels of delta ferrite (<5 FN). In an effort to compensate for the dilution effect this low ferrite material will have on deposited weld metal, it is recommended that the weld filler material used for the first layer be selected on the basis of its ability to produce a deposit meeting the requirements of Document No. COE-107-500 (minimum 7.5 FN as-deposited). For the first layer, it may therefore be necessary to use filler material capable of producing an undiluted weld deposit double the minimum acceptable delta ferrite specified in COE-107-500.
	4.2 Core Plug Repair
4.2.1	This Section describes requirements for the removal of existing plug connections (reference Typical Plug Connection Detail, this ECN page 8) originally installed to cover core samples removed from weldment 02BS-S12 in the mid-1980's. These plug connections will be removed and replaced with backing plugs (reference Backing Plug Installation Detail, this ECN page 8) which in turn will be covered by the weld overlay repair described in Sketch 1598-00044.010-0207 (this ECN page 9).
4.2.2	The work sequence shall be controlled through the use of a process control traveller detailing the steps required to perform this work. As a minimum, the following activity sequences shall be described:
4.2.2.1	Identification: Identify candidate weldment, identify core sample branch connection(s), remove interferences, etc.

### SUPPORT INFORMATION

(Part 4)

ECN No. 04-01333M Design Change No.: E04-1-96-023-A Page 6 of 9

- 4.2.2.2 Removal: Verify that the run pipe is drained of water, remove plug connection by grinding/saw cutting such that run pipe wall thickness is not reduced, avoid the introduction of any material into the run pipe, use plant-approved tape to cover opening until backing plug welding is begun, etc.
- 4.2.2.3 Preparation: Obtain and prepare backing plug material, tack weld temporary handling device onto backing plug, dye penetrant (PT) examine backing plug machined surfaces, etc.
- 4.2.2.4 Welding: Identify appropriate welding procedure and qualified welder, obtain filler material, clean/prepare run pipe and backing plug (avoiding the introduction of any material into the run pipe), fit-up and tack weld backing plug, remove temporary handling device, seal weld backing plug, grind/flap finished seal weld and any remnants of temporary handling device flush with run pipe surface, perform PT and VT examination of welded areas, etc.
- 4.2.2.5 Overlay Application: Verify that backing plug installation and inspection are complete and that the run pipe is reflooded with water, perform weld overlay repair as described in this ECN.
- 4.2.3 The existing run pipe material is type 304 stainless steel. The backing plug material shall be type 304L or 316L stainless steel meeting the requirements of ASME Code Section II and NB-2000 of ASME Section III. Acceptable product forms from which the backing plugs are to be made include: ASME SA-182, SA-403, SA-240, or SA-479.
- Welding filler materials shall be type 308L or 309L meeting the requirements of ASME Code Section II and NB-2000 of ASME Section III. Shielded metal arc welding (SMAW) electrodes shall conform to ASME SFA-5.4; gas tungsten arc welding (GTAW) filler metal shall conform to ASME SFA-5.9. Chemical composition of filler material shall be determined in accordance with ASME Section III, NB-2432. Carbon content shall be limited to a maximum of 0.035%. Delta ferrite shall be determined in accordance with NB-2433 and shall not be less that 8 FN nor greater than 20 FN.
- 4.2.5 All materials shall be supplied with Certified Material Test Reports (CMTR's) from suppliers meeting the requirements of ASME Code Section III, NCA-3800.
- 4.2.6 Welding shall be performed using the SMAW and/or GTAW process(es) in accordance with station-approved welding procedures qualified in accordance with ASME Code Section IX. Welders shall be qualified in accordance with ASME Code Sections IX and XI.

# SUPPORT INFORMATION (Part 4)

ECN No. 04-01333M Design Change No.: <u>E04-1-96-023-A</u> Page \_7\_\_ of \_9\_

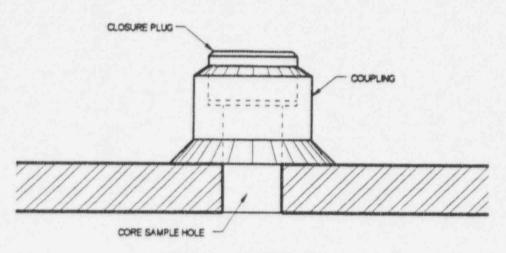
4.2.7	The GTAW process, if used, shall be performed with welding grade (or better) argor shielding gas. Post weld heat treatment is not permitted for this repair.
4.2.8	All machined backing plug surfaces (prior to welding), the installation seal weld, and the affected backing plug area after removal of the temporary handling device, shall be PT examined in accordance with station-approved procedures meeting the acceptance criteria of ASME Code Section III, Articles NB-4000 and NB-5000.
4.2.9	A system pressure test shall be performed after completion of the weld overlay repair covering the backing plug in accordance with ASME Code Section XI, Article IWA-4400.
4.2.10	The repairs shall be documented on a Code Data Report (NIS-2 or equivalent).

### SUPPORT INFORMATION

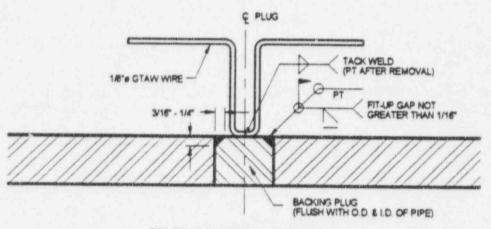
(Part 4)

ECN No.: 04-01333M Design Change No.: E04-1-96-023-A

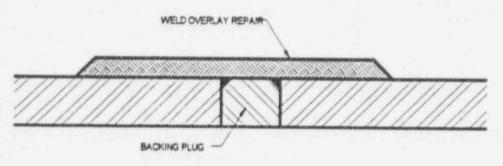
Page 8 of 9



### TYPICAL PLUG CONNECTION DETAIL (TYPICAL 2 PLACES)



#### BACKING PLUG INSTALLATION DETAIL



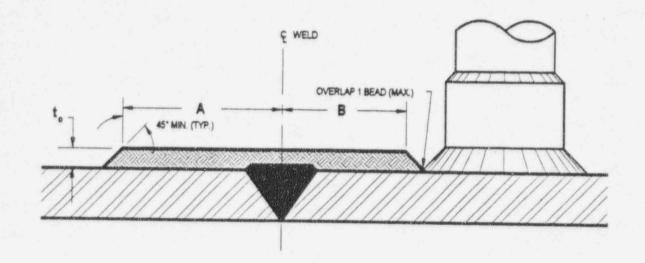
AFTER WELD OVERLAY REPAIR

## SUPPORT INFORMATION

(Part 4)

 ELBOW
 ECN No.: 04-01333M
 PIPE

 UPSTREAM
 Design Change No.: E04-1-96-023-A
 DOWNSTREAM



#### NOTES:

- (1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.
- (2) "ζ" is the minimum required design thickness.
- (3) Extend overlay toward branch line as far as possible. "B" dimension need not exceed 4.5" or shall not be less than 2.5".

WELD NUMBER FLAW CH		DESIGN DIN		IN DIM	ENSIONS				
******	TO MONIDER	FLAW CH	ARACTERIZATION	t,	Α	В		COMMENTS	
0:	2BS-S12	100% thru v	vall by 360° length	0.41"	4.5	(3)	NUREG-0313, Rev. 2 "Standard" Overlay Design		sign
0	FAD . 2/2/20	KM 7/21/06	EPC 3/21/26 \$	WE CHE Z	As A	3/21/96	issued f	or Construction.	
REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR.	17	P.M. APPR./ DATE		DESCRIPTION	
JOB N	0.: 1598-00044.	010	PLANT/UNIT: Quad Citie	es Unit 1		V	And the second second second	SHT. 1	REV
FILE NO.: XCE042.0207		SKETCH NO.: 1598-00044.010-0207			VEC	TRA	OF 1	0	



March 23, 1996 1598-00044.003

Mr. C. Conner Lead, ComEd Inspections Group Commonwealth Edison Company Quad Cities Nuclear Power Station 22710 206th Avenue North Cordova, IL 61242-9700

Subject:

Quad Cities Nuclear Power Station Unit 1 Weld Overlay Repair of Weldment 02AS-S6

Reactor Recirculation System, 0200

"For Construction" ECN Transmittal Letter

ECN No.: 04-01337M P.O.No.: 351285/YY-238 Function No.: 052306-3171

Dear Mr. Conner:

The purpose of this letter is to transmit "For Construction" the attached Engineering Change Notice (ECN) in accordance with Commonwealth Edison Company's Nuclear Engineering Procedures. The following information related to the ECN is provided:

SEC Cognizant Engineer: T. Wojcik

2. Exempt Change Number: E04-1-96-023-B

List of ECNs Contained in Package:

ECN NO. DESCRIPTION

04-01337M Weld Overlay Repair of Weldment 02AS-S6 in

the Reactor Recirculation System.

4. Additional ECNs may be required to complete this exempt change. This ECN may be completed independently of any other work and is being issued as a part of partial exempt change E04-1-96-023-B to support the Station's outage schedule.



5. Required Hardware Procurement Action:

This exempt change does not require any inventory of spare parts. The materials are "Cobalt Free" (<1% Cobalt).

6. ECN Safety Classification:

The ECN is safety related.

7. Other Related, Open Design Changes:

ComEd Station Central File has been contacted and VECTRA has determined that no open DCDs are related to this exempt change.

- Fabrication of parts may proceed without the receipt of a ComEd approval letter. However, installation activities shall not proceed until a ComEd Authorization Letter is received.
- VECTRA requests that ComEd submit a DCR after the ECN is installed to update the affected design documents.
- 10. Acceptance Criteria/Interfacing Requirements Operability Statement:

Examination and acceptance criteria shall be in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments," Latest Revision. This application document requires the measurement of weld overlay axial shrinkage which is used by Engineering to determine the state of sustained stress at unrepaired weldments in the system. The magnitude of sustained stress within a weldment is used to determine the weldment's NUREG-0313, Revision 2, inspection category/frequency. Changes in piping system stress due to weld overlay repairs in not considered an ASME BPVC load case.

11. Interdisciplinary Review:

An interdisciplinary review (IR) has been conducted on the "For Construction" ECN in accordance with VECTRA's Procedures.

12. Spare Parts List:

No spare parts are required.



- 13. Technical Specification/FSAR/UFSAR Document Review Verification.
  - a. List of Systems Involved:

Reactor Recirculation System 0200

Applicable Tech. Spec/FSAR/UFSAR Sections:

Tech. Spec. Sections 3.6/4.6 FSAR Section 4.3 UFSAR Section 5.4

b. Affects of PDC on Tech. Spec/FSAR/UFSAR Sections:

None

c. If no Tech. Spec/FSAR/UFSAR Sections affected, which Sections were reviewed:

See Item 14 (a)

d. Is PDC Installation Outage related?

Yes (X) No ()

Work may be conducted during the Q1R14 or later outage.

e. Is New Design Compatible with Existing System?

Yes. Weld overlay materials are compatible with the existing piping system. Welding shall be in accordance with ASME Sections IX, XI, and Document No. COE-107-500. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.

#### 14. Other Information:

a. Engineering Synopsis:

Examination of reactor recirculation system weldment 02AS-S6 at Quad Cities Unit 1 has identified intergranular stress corrosion cracking (IGSCC). To ensure the integrity of the weldment and the recirculation piping system, a weld overlay repair will be performed.



The weldment is located on the suction side of recirculation pump 1-0202A on line 1-0202A-28"-A.

- b. This minor plant change shall be installed in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments", Latest Revision.
- Material requirements are specified in Document No. COE-107-500.
- d. All of the equipment and components associated with ECN 04-01337M are safety related. No other interferences or interactions with Safety or Class 1E equipment exist. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.
- e. No interfaces with other A/Es are required.
- 15. No engineering assumptions were used in preparing this ECN.

If you have any questions, please call Rob Choromokos or me at (708) 778-0100, or Carl Froehlich at (408) 629-9800.

Very truly yours,

James A. Brown, P.E.

Jame Alon

Project Manager

JAB/lab

Attachment



#### Copies:

S. Eldridge - Quad Cities

MOD Design Supervisor - w/1 ECN package

T. Wojcik - Quad Cities

SEC Cognizant Engineer - w/1 ECN package

M. Sullivan - Quad Cities

Site Construction Superintendent - w/1 ECN package

M. Santic - Quad Cities

System Engineer - w/1 ECN package

T. Dismukes - Quad Cities

Station Central File Supervisor - w/2 ECNs & 1 Silver Aperture

A. Beveroth - Quad Cities

SEC DCR Coordinator - w/1 ECN package

G. J. Tagatz - Quad Cities

Design Change Coordinator - w/letter only

G. Bathje - Quad Cities

Materials Management Supervisor - w/1 ECN package

Bob Larken - Quad Cities

Site Construction - w/1 ECN package

NETS/CHRON System Supervisor

C. H. Froehlich - w/1 ECN Package

File: 1598-00044.D01 - Letter only

1598-00044.F09 - 1 ECN Package

DTR Book - Letter & ECN Parts 1 & 2

JAB-96-032



### **ENGINEERING CHANGE NOTICE** (Part 1)

## ISSUANCE: [X] FOR CONSTRUCTION [] FOR COMMENT ECN NO. 04-01337M

			-	
Affected Unit:Changes to a prev		[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. E04-1-94 Project No. (if appl.) 1591 Supp ID No. (if appl.) N/A System: 0200	-00044
Description of De	esign Change Request:	The second secon	And the second s	NY TRANSITRA DIE PERSONALA AMIN'NY DIE PROPERTY DE L'ANNO DE L'ANNO DE L'ANNO DE L'ANNO DE L'ANNO DE L'ANNO DE
Weld overla System.	y repair (WOR) of weldme	ent 02AS-S6 on line 1-0202A-28	8" of the Reactor Reci	rculation
A weld over		(Provide reason for change, specific actions req o weldment 02AS-S6 on line 1-		
		INTERFACEN COMMENTS by:		
Design Group or Discipline	Name of Commenter (Printed)	Signature of Commenter	Date	C or NC
Elect./I&C	N/R	N/R	NR	
Mechanical	DAVE DEGRUSH	Pchonono los for DPD TELELON	3/23/96	NC
Structural	C.E. PROKUSKI	CEP rahnehi	3/23/96	NC
Weld & Mati.	J. A. BROWN	Jam ABon	3/23/96	NC
Others				
Prepared by: 4.		Elist Clumber conse	Approved by:	3n
All affected design	documents revised by (date):			
Verified by:		Date:		

# DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST (Part 2)

Asso	ciated Wit	h:		DCD N	lumber		04-0133	7M	
	ECN -	Comment		Station:	Qu	ad Ci	ties	Unit: 1	
120	ECN -	Construction		Plant D	esign (	Chang	e/Change	Authority:	
	FCR					Туре	:	EPC	
	Other:					Num	ber: E	04-1-96-023-B	MATERIAL SECURIOR STREET
Part 1 - Ger	neral Infor	mation - Option	al for FCR	Date Pr	repared	l:	3/21/96		
VE:	6_ Proj	ect No.:15	98-00044	_ W.O. g	r Fund	ction l	No.: 0:	52306-3171	
Originator: Siegel, K. Department: N/A				Organia	zation:	-		ECTRA Technol	ogies
								(708) 778-42	
Description:	Weld o	verlay repair	of weldmen					of the Reactor R	
		n Change Dox							Acquisited to the proposed of the property of the second o
1 2 3 4 Control Roc					8.		s Affected	-	
	DESIG	N DOCUMEN	NT (DD)		C /	F/	Crit. Drwg.	(Ref # from	Incorp. Rev. or
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date	R*	D *		Part 2)	Date Optional
DWG-C	C502	M-3103	3	E	R	D			
						1			

\*\*'F' for Functional or 'D' for Detailed

Reproduced from: NEP-08-01, Issued 9/30/94

<sup>&</sup>quot;'C' for Construction or 'R' for Record

# Back-Up Calculation Listing (Part 2)

ECN No. 04-01337M
Design Change No.: E04-1-96-023-B
Page 3 of 6

Calculation/Analysis No.

XCE042.0323

Revision No.

0

Description

Weld Overlay Repair Design for Quad Cities Unit 1, Welds 02AS-S6, 02AS-F2, 02AS-S4, 02AD-F12 - 1996 Outage

# CERTIFICATION PAGE (Part 3)

ECN No. 04-01337M
Design Change No.: <u>E04-1-96-023-B</u>
Page <u>4</u> of <u>6</u>

Station:	Ouad Cities	Affected Unit:	1	Page: of
	CERTIFICATION OF ECN NO.	04-01337M		
	I certify that this Engineering Chand I am a registered Professiona	ange Notice was pre I Engineer under the	epared by me o	r under my supervision tate of Illinois.
	Certified by:	John	Date:	
			Seal	062-040931 Z REGISTERED PROFESSIONAL ENGINEER OF

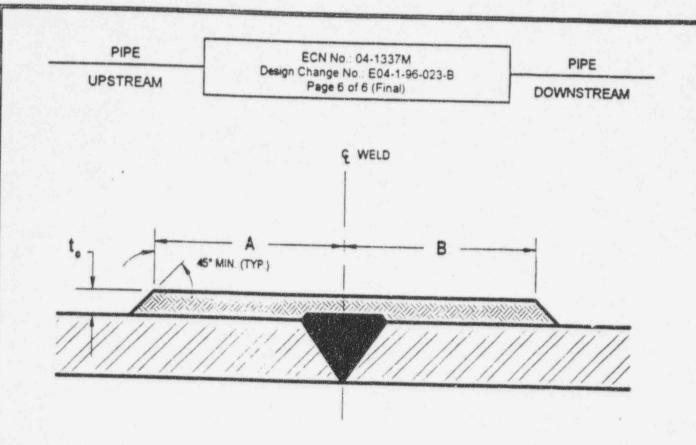
# SUPPORT INFORMATION (Part 4)

ECN No. <u>04-01337M</u>
Design Change No.: <u>E04-1-96-023-B</u>
Page \_\_5 \_\_ of \_\_6

#### 4.1 General

Note No.	Description
4.1.1	Weld overlay application shall be in accordance with page 6 of this ECN (Sketch 1598-00044.010-0208) and shall comply with the technical requirements contained in Document No. COE-107-500, Latest Revision.
4.1.2	Detailed joint configuration information and thickness data shall be reported to Engineering prior to application of the overlay.
4.1.3	During weld overlay implementation, the "as-built" configuration shall be recorded or a Weld Overlay Data Sheet as specified in Document No. COE-107-500, Latest Revision.
4.1.4	The base materials to which this WOR is to be applied contain low levels of delta ferrite (<5 FN). In an effort to compensate for the dilution effect this low ferrite material will have on deposited weld metal, it is recommended that the weld filler material used for the first layer be selected on the basis of its ability to produce a deposit meeting the requirements of Document No. COE-107-500 (minimum 7.5 FN as-deposited). For the first layer, it may therefore be necessary to use filler material capable of producing an undiluted weld deposit double the minimum acceptable delta ferrite specified in COE-107-500.

# SUPPORT INFORMATION (Part 4)



#### NOTES:

- (1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.
- (2) "t," is the minimum design thickness.

WELD NUMBER FLAW CH		ARACTERIZATION DESIGN D		N DIMEN	SIONS	The state of the s				
·			THEOTERIZATION	t,	Α	В		COMMENTS		
0	2AS-S5	100% thru v	vall by 360° length	0.45*	4.5"	4.5"	NUREG-0313, Rev. 2 *Standard* Overlay Design		sign	
0	TEO 3/22/96	75M 3/22/96	RPC 3/22/96 5	A STATE OF	los B	3-1-6	leguad	los Const	The same of the sa	
REV.	PREP.BY/ DATE	CHK. 8Y/ DATE	P.E. APPR/ DATE	E.M. APPR.	P.N	A. APPR J DATE	DESCRIPTION		THE RESIDENCE OF THE PERSONS ASSESSED.	
JOB NO.: 1598-00044.010		PLANT/UNIT: Quad Cities Unit 1		1	<b>V</b>		SHT.	1	REV	
FILE NO.: XCE042.0208		SKETCH NO.: 1598-00044.010-0208			VECT		OF	1	0	



VECTRA March 26, 1996 1598-00044.004

Mr. C. Conner Lead, ComEd Inspections Group Commonwealth Edison Company Quad Cities Nuclear Power Station 22710 206th Avenue North Cordova, IL 61242-9700

Subject:

Quad Cities Nuclear Power Station Unit 1 Weld Overlay Repair of Weldment 02AS-F2

Reactor Recirculation System, 0200

"For Construction" ECN Transmittal Letter

ECN No.: 04-01339M P.O.No.: 351285/YY-238 Function No.: 052306-3171

Dear Mr. Conner:

The purpose of this letter is to transmit "For Construction" the attached Engineering Change Notice (ECN) in accordance with Commonwealth Edison Company's Nuclear Engineering Procedures. The following information related to the ECN is provided:

1. SEC Cognizant Engineer: T. Wojcik

2. Exempt Change Number: E04-1-96-023-C

3. List of ECNs Contained in Package:

ECN NO. DESCRIPTION

04-01339M Weld Overlay Repair of Weldment 02AS-F2 in

the Reactor Recirculation System.

4. Additional ECNs may be required to complete this exempt change. This ECN may be completed independently of any other work and is being issued as a part of partial exempt change E04-1-96-023-C to support the Station's outage schedule.



5. Required Hardware Procurement Action:

This exempt change does not require any inventory of spare parts. The materials are "Cobalt Free" (<1% Cobalt).

ECN Safety Classification:

The ECN is safety related.

7. Other Related, Open Design Changes:

ComEd Station Central File has been contacted and VECTRA has determined that no open DCDs are related to this exempt change.

- 8. Fabrication of parts may proceed without the receipt of a ComEd approval letter. However, installation activities shall not proceed until a ComEd Authorization Letter is received.
- VECTRA requests that ComEd submit a DCR after the ECN is installed to update the affected design documents.
- 10. Acceptance Criteria/Interfacing Requirements Operability Statement:

Examination and acceptance criteria shall be in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments," Latest Revision. This application document requires the measurement of weld overlay axial shrinkage which is used by Engineering to determine the state of sustained stress at unrepaired weldments in the system. The magnitude of sustained stress within a weldment is used to determine the weldment's NUREG-0313, Revision 2, inspection category/frequency. Changes in piping system stress due to weld overlay repairs is not considered an ASME BPVC load case.

11. Interdisciplinary Review:

An interdisciplinary review (IR) has been conducted on the "For Construction" ECN in accordance with VECTRA's Procedures.

12. Spare Parts List:

No spare parts are required.



- 13. Technical Specification/FSAR/UFSAR Document Review Verification.
  - a. List of Systems Involved:

Reactor Recirculation System 0200

Applicable Tech. Spec/FSAR/UFSAR Sections:

Tech. Spec. Sections 3.6/4.6 FSAR Section 4.3 UFSAR Section 5.4

b. Effects of PDC on Tech. Spec/FSAR/UFSAR Sections:

Noric

c. If no Tech. Spec/FSAR/UFSAR Sections affected, which Sections were reviewed:

See Item 14 (a)

d. Is PDC Installation Outage related?

Yes (X) No ()

Work may be conducted during the Q1R14 or later outage.

e. Is New Design Compatible with Existing System?

Yes. Weld overlay materials are compatible with the existing piping system. Welding shall be in accordance with ASME Sections IX, XI, and Document No. COE-107-500. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.

#### 14. Other Information:

Engineering Synopsis:

Examination of reactor recirculation system weldment 02AS-F2 at Quad Cities Unit 1 has identified intergranular stress corrosion cracking (IGSCC). To ensure the integrity of the weldment and the recirculation piping system, a weld overlay repair will be performed.



The weldment is located on the suction side of recirculation pump 1-202A on line 1-0202A-28"-A.

- b. This minor plant change shall be installed in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments", Latest Revision.
- c. Material requirements are specified in Document No. COE-107-500.
- d. All of the equipment and components associated with ECN 04-01339M are safety related. No other interferences or interactions with Safety or Class 1E equipment exist. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.
- e. No interfaces with other A/Es are required.
- 15. No engineering assumptions were used in preparing this ECN.

If you have any questions, please call Rob Choromokos or me at (708) 778-0100, or Carl Froehlich at (408) 629-9800.

Very truly yours,

James A. Brown, P.E.

Project Manager

JAB/lab

Attachment



#### Copies:

S. Eldridge - Quad Cities MOD Design Supervisor - w/1 ECN package

T. Wojcik - Quad Cities SEC Cognizant Engineer - w/1 ECN package

M. Sullivan

Site Construction Superintendent - w/1 ECN package

M. Santic - Quad Cities

System Engineer - w/1 ECN package

T. Dismukes - Quad Cities

Station Central File Supervisor - w/2 ECNs & 1 Silver Aperture

A. Beveroth

SEC DCR Coordinator - w/1 ECN package

G. J. Tagatz - Quad Cities

Design Change Coordinator - w/letter only

A. Lynch - Quad Cities

Materials Management Supervisor - w/1 ECN package

Bob Larken

Site Construction - w/1 ECN package

NETS/CHRON System Supervisor

C. H. Froehlich - w/1 ECN Package

File: 1598-00044.D01 - Letter only

1598-00044.F09 - 1 ECN Package

DTR Book - Letter & ECN Parts 1 & 2

JAB-96-033



### **ENGINEERING CHANGE NOTICE**

(Part 1)

#### **VECTRA**

### ISSUANCE: [X] FOR CONSTRUCTION [] FOR COMMENT ECN No. 04-01339M

Page 1 of 6

Affected Unit: Changes to a prev	A STATE OF THE PARTY OF THE PAR	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. <u>E04-1-96-023-C</u> Project No. (if appl.) <u>1598-00044</u> Supp ID No. (if appl.) <u>N/A</u> System: <u>0200</u>		
	esign Change Request:  By repair (WOR) of weldme	ent 02AS-F2 on line 1-0202A-2	28" of the Reactor Re	circulation	
A weld over		(Provide reason for change, specific actions reto weldment 02AS-F2 on line 1			
	-	INTERFACING COMMENTS by:	T		
Danian Carrier or					
Design Group or Discipline	Name of Commenter (Printed)	Signature of Commenter	Date	C or NC	
Design Group or Discipline  Elect./I&C	Name of Commenter (Printed)	Signature of Commenter	Date	C or NC	
Discipline		**************************************	3/26/9(_	C or NC	
Discipline  Elect./I&C	N/A	11/19			
Elect./I&C Mechanical	N/A OLOF ANDERSSON	Milas-	3/26/9(_	NC	
Discipline  Elect./I&C  Mechanical  Structural	DLOF ANDERSSON  J.E. NEURAUTER	Milan CE Memanter	3/26/9(-	NC NC	
Discipline  Elect./I&C  Mechanical  Structural  Weld & Matl.  Others  Prepared by:	DLOF ANDERSSON  J. E. NEURAUTER  J. A. BROWN  Review b	Milan CE Memanter	3/26/9(-	NC NC	

### DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST

(Part 2)

Asso		DCD N	DCD Number: 04-01339M									
	ECN -	Comment		Station:	Qu	ad C	ities	Unit: 1				
133	ECN - Construction					Plant Design Change/Change Authority:						
		Type: EPC				2000 Television Inc. (1997) 1997 1997						
	Other:							04-1-96-023-C				
Part 1 - General Information - Optional for FCR				Date Pr	Date Prepared: 3/25/96							
A/E:V006				_ W.O. o	W.O. or Function No.: 052306-3171							
Originator: Siegel, K.				Organiz	ation:			VECTRA Technologies				
Department: N/A												
								of the Reactor P				
		n Change Doo										
Ref.         No.         Type         Number           1.					6.			Number				
4.					8.							
		ngs Affected?		XNo		& ID		:YesX	_No			
DESIGN DOCUMENT (DD)					1	1	Crit. Drwg.	Related DCDs (Ref # from	Rev. or			
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date	R*	D *		Part 2)	Date Optional			
DWG-C	C502	M-3103	3	Е	R	D						

Reproduced from: NEP-08-01, Issued 9/30/94

<sup>\*&#</sup>x27;C' for Construction or 'R' for Record \*\*'F' for Functional or 'D' for Detailed

## **Back-Up Calculation Listing**

(Part 2)

ECN No. 04-01339M

Design Change No.: E04-1-96-023-C

Page 3 of 6

Calculation/Analysis No.

Revision No.

Description

XCE042.0323

1

Weld Overlay Repair Design for Quad Cities Unit 1 - Welds 02AS-S6, 02AS-F2, 02AS-S4, 02AD-F12 - 1996 Outage

Reproduced from: NEP-08-01, Issued 9/30/94

## CERTIFICATION PAGE

(Part 3)

ECN No. <u>04-01339M</u>
Design Change No.: <u>E04-1-96-023-C</u>
Page <u>4</u> of <u>6</u>

Station:	Quad Cities	Affected Unit:	1	Page:1_ of1_
	CERTIFICATION OF ECN NO	O. <u>04-01339M</u>		
	I certify that this Engineering C and I am a registered Profession			
	Certified by:	3m_	_ Date:	
			Seal	062-040931 REGISTERED PROFESSIONAL ENGINEER OF

# SUPPORT INFORMATION (Part 4)

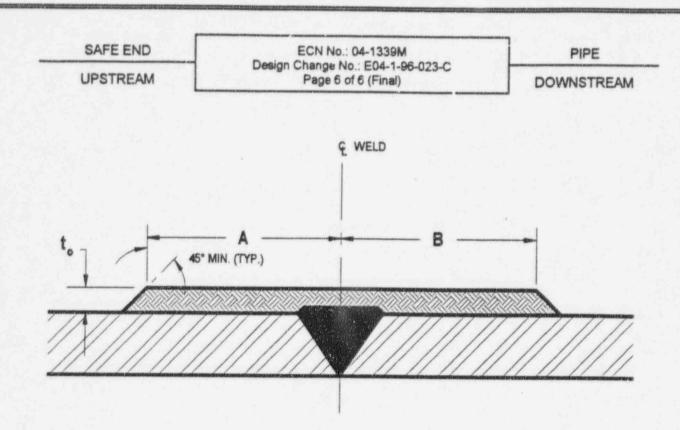
ECN No. <u>04-01339M</u>
Design Change No.: <u>E04-1-96-023-C</u>
Page <u>5</u> of <u>6</u>

## 4.1 General

Note No.	Description
4.1.1	Weld overlay application shall be in accordance with page 6 of this ECN (Sketch 1598-00044.010-0209) and shall comply with the technical requirements contained in Document No. COE-107-500, Latest Revision.
4.1.2	Detailed joint configuration information and thickness data shall be reported to Engineering prior to application of the overlay.
4.1.3	During weld overlay implementation, the "as-built" configuration shall be recorded on a Weld Overlay Data Sheet as specified in Document No. COE-107-500, Latest Revision.
4.1.4	The base materials to which this WOR is to be applied contain low levels of delta ferrite (<5 FN). In an effort to compensate for the dilution effect this low ferrite material will have on deposited weld metal, it is recommended that the weld filler material used for the first layer be selected on the basis of its ability to produce a deposit meeting the requirements of Document No. COE-107-500 (minimum 7.5 FN as-deposited). For the first layer, it may therefore be necessary to use filler material capable of producing an undiluted weld deposit double the minimum acceptable delta ferrite specified in COE-107-500.

## SUPPORT INFORMATION

(Part 4)



### NOTES:

- (1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.
- (2) "t," is the minimum design thickness.

WEI	WELD NUMBER FLAW CHARACTERIZATION		DESIGN DIMENSIONS										
** 10-10	DITOMBER	FLAVV CH	FLAW CHARACTERIZATION				FLAW CHARACTERIZATION to		Α	A B	COMMENTS		
0	2AS-F2	-F2 100% thru wall by 360° length		0.45*	4.5"	4.5"	NUREG-0313, Rev. 2 "Standard" Overlay Design						
0	3/29/96	75m 3/25/96	ERC 3/25/96	CN7 3/25/96	Bu	3/26/96	Issued fo	or Constru	iction.				
REV.	PREP. BY/ DATE	CHK BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M	APPR/		DESCR	RIPTION				
JOB NO	0.: 1598-00044.	010	PLANT/UNIT: Quad Cit	PLANT/UNIT:  Quad Cities Unit 1		<b>V</b>		SHT.	1	REV.			
FILE NO.: SKETCH NO.: 1598-00044.010-0		4.010-0209		VEC.	ΓRA	OF	1	0					



VECTRA March 26, 1996 1598-00044,005

Mr. C. Conner Lead, ComEd Inspections Group Commonwealth Edison Company Quad Cities Nuclear Power Station 22710 206th Avenue North Cordova, IL 61242-9700

Subject:

Quad Cities Nuclear Power Station Unit 1 Weld Overlay Repair of Weldment 02AS-S4

Reactor Recirculation System, 0200

"For Construction" ECN Transmittal Letter

ECN No.: 04-01340M P.O.No.: 351285/YY-238 Function No.: 052306-3171

Dear Mr. Conner:

The purpose of this letter is to transmit "For Construction" the attached Engineering Change Notice (ECN) in accordance with Commonwealth Edison Company's Nuclear Engineering Procedures. The following information related to the ECN is provided:

SEC Cognizant Engineer: T. Wojcik

Exempt Change Number: E04-1-96-023-D

List of ECNs Contained in Package:

ECN NO. DESCRIPTION

04-01340M Weld Overlay Repair of Weldment 02AS-S4 in

the Reactor Recirculation System.

4. Additional ECNs may be required to complete this exempt change. This ECN may be completed independently of any other work and is being issued as a part of partial exempt change E04-1-96-023-D to support the Station's outage schedule.



5. Required Hardware Procurement Action:

This exempt change does not require any inventory of spare parts. The materials are "Cobalt Free" (<1% Cobalt).

ECN Safety Classification:

The ECN is safety related.

7. Other Related, Open Design Changes:

ComEd Station Central File has been contacted and VECTRA has determined that no open DCDs are related to this exempt change.

- Fabrication of parts may proceed without the receipt of a ComEd approval letter. However, installation activities shall not proceed until a ComEd Authorization Letter is received.
- VECTRA requests that ComEd submit a DCR after the ECN is installed to update the affected design documents.
- 10. Acceptance Criteria/Interfacing Requirements Operability Statement:

Examination and acceptance criteria shall be in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments," Latest Revision. This application document requires the measurement of weld overlay axial shrinkage which is used by Engineering to determine the state of sustained stress at unrepaired weldments in the system. The magnitude of sustained stress within a weldment is used to determine the weldment's NUREG-0313, Revision 2, inspection category/frequency. Changes in piping system stress due to weld overlay repairs is not considered an ASME BPVC load case.

11. Interdisciplinary Review:

An interdisciplinary review (IR) has been conducted on the "For Construction" ECN in accordance with VECTRA's Procedures.

12. Spare Parts List:

No spare parts are required.



- 13. Technical Specification/FSAR/UFSAR Document Review Verification.
  - a. List of Systems Involved:

Reactor Recirculation System 0200

Applicable Tech. Spec/FSAR/UFSAR Sections:

Tech. Spec. Sections 3.6/4.6 FSAR Section 4.3 UFSAR Section 5.4

b. Effects of PDC on Tech. Spec/FSAR/UFSAR Sections:

None

c. If no Tech. Spec/FSAR/UFSAR Sections affected, which Sections were reviewed:

See Item 14 (a)

d. Is PDC Installation Outage related?

Yes (X) No ()

Work may be conducted during the Q1R14 or later outage.

e. Is New Design Compatible with Existing System?

Yes. Weld overlay materials are compatible with the existing piping system. Welding shall be in accordance with ASME Sections IX, XI, and Document No. COE-107-500. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.

### 14. Other Information:

a. Engineering Synopsis:

Examination of reactor recirculation system weldment 02AS-S4 at Quad Cities Unit 1 has identified intergranular stress corrosion cracking (IGSCC). To ensure the integrity of the weldment and the recirculation piping system, a weld overlay repair will be performed.



The weldment is located on the suction side of recirculation pump 1-0202A on line 1-0202A-28"-A.

- b. This minor plant change shall be installed in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments", Latest Revision.
- Material requirements are specified in Document No. COE-107-500.
- d. All of the equipment and components associated with ECN 04-01340M are safety related. No other interferences or interactions with Safety or Class 1E equipment exist. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.
- e. No interfaces with other A/Es are required.
- 15. No engineering assumptions were used in preparing this ECN.

If you have any questions, please call Rob Choromokos or me at (708) 778-0100, or Carl Froehlich at (408) 629-9800.

Very truly yours,

James A. Brown, P.E.

Project Manager

JAB/lab

Attachment



### Copies:

S. Eldridge - Quad Cities MOD Design Supervisor - w/1 ECN package

T. Wojcik - Quad Cities

SEC Cognizant Engineer - w/1 ECN package

M. Sullivan

Site Construction Superintendent - w/1 ECN package

M. Santic - Quad Cities

System Engineer - w/1 ECN package

T. Dismukes - Quad Cities

Station Central File Supervisor - w/2 ECNs & 1 Silver Aperture

A. Beveroth

SEC DCR Coordinator - w/1 ECN package

G. J. Tagatz - Quad Cities

Design Change Coordinator - w/letter only

A. Lynch - Quad Cities

Materials Management Supervisor - w/1 ECN package

Bob Larken

Site Construction - w/1 ECN package

NETS/CHRON System Supervisor

C. H. Froehlich - w/1 ECN Package

File: 1598-00044.D01 - Letter only

1598-00044.F09 - 1 ECN Package

DTR Book - Letter & ECN Parts 1 & 2

JAB-96-034



### **ENGINEERING CHANGE NOTICE** (Part 1)

ISSUANCE: [X] FOR CONSTRUCTION [] FOR COMMENT ECN NO. 04-01340M

Page 1 of 6

		[X] Safety Related  [ ] Non-Safety Related  [ ] Regulatory  Design Change No. E04-1-96-023-D  Project No. (if appl.) 1598-00044  Supp ID No. (if appl.) N/A  System: 0200					
		ent 02AS-S4 on line 1-0202A-2	8" of the Reactor Re	circulation			
A weld over		(Provide reason for change, specific actions recto weldment 02AS-S4 on line 1-					
		INTERFACING COMMENTS by:					
Design Group or Discipline	Name of Commenter (Printed)	Signature of Commenter	Date	C or NC			
Elect./I&C	N/A	N/A	OF THE STREET,				
Mechanical	CLOF ANDERSSEN	( My conte	3/26/96	NC			
Structural	J.E. NEURAUTER	95 Demarte	3/26/46	NC			
Weld & Matl.	J. A. BROWN	9.4. Pon	3/26/96	NC			
Others							
Prepared by: Ea	Review b	3/26/36	Approved by:				
	documents revised by (date):						
Verified by:		Date:					

# DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST (Part 2)

Assoc	ciated With	n:		DCD N	umber:		04-01340	M		
	ECN - C	Comment		Station:	Qua	d Cit	ies	Unit: _1		
130	ECN - C	Construction		Plant Design Change/Change Authority:						
	□ FCR				Type: EPC					
	Other:					Numb	er: E	14-1-96-023-D		
Part 1 - Gen	eral Inform	nation - Options	al for FCR	Date Pr	epared		3/25/96			
		ct No.:15			r Func	tion N	No.:05	2306-3171		
		gel, K.			ation:	-	V	ECTRA Technol	ogies	
		N/A			No./Ex	t:		(708) 778-42	66	
Description:	Weld o	verlay repair o	of weldmen					of the Reactor R		
									***************************************	
		n Change Doc		ECN. F	CR)					
2 3 4 Control Roc		ngs Affected?			6. 7. 8.	& ID	s Affected	Yes _X	_No	
ran 3 - Al		N DOCUMEN			С			Related DCDs		
	DESIG	N DOCUME.	(22)		1	1	Drwg.	(Ref # from Part 2)	Rev. or Date	
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date	R*	D * *		Part 2)	Optional	
DWG-C	C502	M-3103	3	Е	R	D				
					-	-				
		U- 11 I								

\*\*'F' for Functional or 'D' for Detailed

Reproduced from: NEP-08-01, Issued 9/30/94

<sup>\*&#</sup>x27;C' for Construction or 'R' for Record

## **Back-Up Calculation Listing**

(Part 2)

ECN No. 04-01340M

Design Change No.: E04-1-96-023-D

Page 3 of 6

Calculation/Analysis No.

Revision No.

Description

KCE042.0323

1

Weld Overlay Repair Design for Quad Cities Unit 1 - Welds 02AS-S6, 02AS-F2, 02AS-S4, 02AD-F12 - 1996 Outage

Reproduced from: NEP-08-01, Issued 9/30/94

## CERTIFICATION PAGE

(Part 3)

ECN No. 04-01340M Design Change No.: <u>E04-1-96-023-D</u>

Page 4 of 6

Station:	Ouad Cities	Affected Unit:		Page:1_ of _1_	
	CERTIFICATION OF ECN NO	04-01340	DM		
	I certify that this Engineering Ch	hange Notice wa	s prepared by me	e or under my supervision	
	and I am a registered Profession	al Engineer unde	er the laws of the	State of Illinois.	
	Certified by:	8m	Date		
			Seal	OG2-040931 REGISTERED PROFESSIONAL ENGINEER OF	

## SUPPORT INFORMATION

(Part 4)

ECN No. <u>04-01340M</u>
Design Change No.: <u>E04-1-96-023-D</u>
Page <u>5</u> of <u>6</u>

## 4.1 General

Note No.	Description
4.1.1	Weld overlay application shall be in accordance with page 6 of this ECN (Sketch 1598-00044.010-0210) and shall comply with the technical requirements contained in Document No. COE-107-500, Latest Revision.
4.1.2	Detailed joint configuration information and thickness data shall be reported to Engineering <u>prior</u> to application of the overlay.
4.1.3	During weld overlay implementation, the "as-built" configuration shall be recorded of a Weld Overlay Data Sheet as specified in Document No. COE-107-500, Latest Revision.
4.1.4	The base materials to which this WOR is to be applied contain low levels of delta ferrite (<5 FN). In an effort to compensate for the dilution effect this low ferrite material will have on deposited weld metal, it is recommended that the weld filler material used for the first layer be selected on the basis of its ability to produce a deposit meeting the requirements of Document No. COE-107-500 (minimum 7.5 FN as-deposited). For the first layer, it may therefore be necessary to use filler material capable of producing an undiluted weld deposit double the minimum acceptable delta ferrite specified in COE-107-500.

## SUPPORT INFORMATION

(Part 4)

### NOTES:

- (1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.
- (2) "t," is the minimum design thickness.
- (3) Extend overlay towards whip restraint as far as possible. "B" dimension need not exceed 4.5" nor shall be less than 4.0".

VAZET	D NUMBER	UMBER FLAW CHARACTERIZATION		DESIG	N DIMENS	SIONS				
AAET	DNOMBER	FLAW CH	ARACTERIZATION			A B	COMMENTS			
02AS-S4 100% thru wall by 360° length		0.45*	4.5" (3)		NUREG-0313, Rev. 2 "Standard" Overlay Design					
0	13/25/26	7Km 3/25/96	RPC 3/15/56	CHJ 3/25/56	Br	5/26/96	Issued fo	or Construc	tion.	
REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ P.M. APPR DATE DATE		APPR./	DESCRIPTION			
JOB N	NO.: PLANT/UNIT: 1598-00044.010 Quad Cities		es Unit 1	-	<b>V</b>	And the second s	SHT.	1	REV.	
FILE NO.: S XCE042.0210		SKETCH NO.: 1598-00044	1.010-0210		VEC	TRA	OF	1	0	



VECTRA March 26, 1996 1598-00044,006

Mr. C. Conner
Lead, ComEd Inspections Group
Commonwealth Edison Company
Quad Cities Nuclear Power Station
22710 206th Avenue North
Cordova, IL 61242-9700

Subject:

Quad Cities Nuclear Power Station Unit 1 Weld Overlay Repair of Weldment 02AD-F12

Reactor Recirculation System, 0200

"For Construction" ECN Transmittal Letter

ECN No.: 04-01341M P.O.No.: 351285/YY-238 Function No.: 052306-3171

### Dear Mr. Conner:

The purpose of this letter is to transmit "For Construction" the attached Engineering Change Notice (ECN) in accordance with Commonwealth Edison Company's Nuclear Engineering Procedures. The following information related to the ECN is provided:

1. SEC Cognizant Engineer: T. Wojcik

Exempt Change Number: E04-1-96-023-E

List of ECNs Contained in Package:

ECN NO. DESCRIPTION

04-01341M Weld Overlay Repair of Weldment 02AD-F12 in

the Reactor Recirculation System.

4. Additional ECNs may be required to complete this exempt change. This ECN may be completed independently of any other work and is being issued as a part of partial exempt change E04-1-96-023-E to support the Station's outage schedule.



Required Hardware Procurement Action:

This exempt change does not require any inventory of spare parts. The materials are "Cobalt Free" (<1% Cobalt).

6. ECN Safety Classification:

The ECN is safety related.

Other Related, Open Design Changes:

ComEd Station Central File has been contacted and VECTRA has determined that no open DCDs are related to this exempt change.

- Fabrication of parts may proceed without the receipt of a ComEd approval letter. However, installation activities shall not proceed until a ComEd Authorization Letter is received.
- VECTRA requests that ComEd submit a DCR after the ECN is installed to update the affected design documents.
- 10. Acceptance Criteria/Interfacing Requirements Operability Statement:

Examination and acceptance criteria shall be in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments," Latest Revision. This application document requires the measurement of weld overlay axial shrinkage which is used by Engineering to determine the state of sustained stress at unrepaired weldments in the system. The magnitude of sustained stress within a weldment is used to determine the weldment's NUREG-0313, Revision 2, inspection category/frequency. Changes in piping system stress due to weld overlay repairs is not considered an ASME BPVC load case.

11. Interdisciplinary Review:

An interdisciplinary review (IR) has been conducted on the "For Construction" ECN in accordance with VECTRA's Procedures.

12. Spare Parts List:

No spare parts are required.



- 13. Technical Specification/FSAR/UFSAR Document Review Verification.
  - a. List of Systems Involved:

Reactor Recirculation System 0200

Applicable Tech. Spec/FSAR/UFSAR Sections:

Tech. Spec. Sections 3.6/4.6 FSAR Section 4.3 UFSAR Section 5.4

b. Effects of PDC on Tech. Spec/FSAR/UFSAR Sections:

None

c. If no Tech. Spec/FSAR/UFSAR Sections affected, which Sections were reviewed:

See Item 14 (a)

d. Is PDC Installation Outage related?

Yes (X) No ()

Work may be conducted during the Q1R14 or later outage.

e. Is New Design Compatible with Existing System?

Yes. Weld overlay materials are compatible with the existing piping system. Welding shall be in accordance with ASME Scctions IX, XI, and Document No. COE-107-500. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.

### 14. Other Information:

a. Engineering Synopsis:

Examination of reactor recirculation system weldment 02AD-F12 at Quad Cities Unit 1 has identified intergranular stress corrosion cracking (IGSCC). To ensure the integrity of the weldment and the recirculation piping system, a weld overlay repair will be performed.



The weldment is located on the discharge side of recirculation pump 1-0202A on line 1-0202A-28"-A.

- b. This minor plant change shall be installed in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments", Latest Revision.
- c. Material requirements are specified in Document No. COE-107-500.
- d. All of the equipment and components associated with ECN 04-01341M are safety related. No other interferences or interactions with Safety or Class 1E equipment exist. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.
- e. No interfaces with other A/Es are required.
- 15. No engineering assumptions were used in preparing this ECN.

If you have any questions, please call Rob Choromokos or me at (708) 778-0100, or Carl Froehlich at (408) 629-9800.

Very truly yours,

James A. Brown, P.E.

Project Manager

JAB/lab

Attachment



### Copies:

S. Eldridge - Quad Cities MOD Design Supervisor - w/1 ECN package

T. Wojcik - Quad Cities

SEC Cognizant Engineer - w/1 ECN package

M. Sullivan - Quad Cities

Site Construction Superintendent - w/1 ECN package

M. Santic - Quad Cities

System Engineer - w/1 ECN package

T. Dismukes - Quad Cities

Station Central File Supervisor - w/2 ECNs & 1 Silver Aperture

A. Beveroth - Quad Cities

SEC DCR Coordinator - w/1 ECN package

G. J. Tagatz - Quad Cities

Design Change Coordinator - w/letter only

A. Lynch - Quad Cities

Materials Management Supervisor - w/1 ECN package

Bob Larken - Quad Cities

Site Construction - w/1 ECN package

NETS/CHRON System Supervisor

C. H. Froehlich - w/1 ECN Package

File: 1598-00044.D01 - Letter only

1598-00044.F09 - 1 ECN Package

DTR Book - Letter & ECN Parts 1 & 2

JAB-96-035



# ENGINEERING CHANGE NOTICE (Part 1)

ISSUANCE: [X] FOR CONSTRUCTION [] FOR COMMENT ECN No. 04-01341M

Page 1 of 6

TANKS AND	AT THE PARTY OF TH	THE RESIDENCE OF THE PARTY OF T				
Station:Affected Unit:Changes to a previous		[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. <u>E04-1-96-023-E</u> Project No. (if appl.) <u>1598-00044</u> Supp ID No. (if appl.) <u>N/A</u> System: <u>0200</u>			
Description of De	siga Change Request:			The second section of the second section of the second section section of the second section of the second section sec		
Weld overla System.	y repair (WOR) of weldme	ent 02AD-F12 on line 1-0201A	-28" of the Reactor R	ecirculation		
A weld over		(Provide reason for change, specific actions recovered by the control of the cont				
	The state of the s	INTERFACING COMMENTS by:				
Design Group or Discipline	Name of Commenter (Printed)	Signature of Commenter	Date	C or NC		
Elect./I&C	NA	NIA				
Mechanical	OLDE ANDERSSON	Eld Jacken	3/26/96	NC		
Structural	J. E. NEURAUTER	18 Newsy Eu	3/26/96	NC		
Weld & Matl.	U. A. BROWN	JA.Bm.	3/26/96	NC		
Others						
Prepared by: 15 3/26/96 Review by: 1111 Pulling C or 10 Approved by: 126/96  Date: 3/26/96 Date: 3/26/96						
	documents revised by (date):	Date:		**************************************		

## DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST

(Part 2)

A	ciated Wit	·h·		DCD A	Turnhor		04 0124	134			
					DCD Number: 04-01341M  Station: Quad Cities Unit: 1						
		Comment			Station: Ouad Cities Unit: 1						
		Construction		Plant L	Plant Design Change/Change Authority:						
	FCR				Type: EPC						
	Other:					Num	ber: E	04-1-96-023-E	we have a second		
Part 1 - Gen	eral Infor	mation - Option	al for FCR	Date P	repared	1:	3/25/26	<u> </u>			
A/E: <u>V00</u>	_ W.O. s	or Fund	ction 1	No.: _0	52306-3171						
Originator:	Sie	egel, K.	MATERIA MATERIA MATERIA	Organi	zation:	-	,	VECTRA Techno	logies		
Department:	-	N/A	OF STREET, STR	_ Phone	No./Ex	kt: _		(708) 778-42	266		
Description:	Weld o	verlay repair o	f weldmen	t 02AD-F1	2 on li	ne 1-(	201A-28	of the Peactor R	Recirculation		
System.		MARKET VALUE OF THE REPORT OF THE PERSON OF						SALANDA SERVICE SERVIC			
Part 2 - Rela	ated Desig	gn Change Doc	cuments (i.	e., ECN, F	CR)						
1 2 3 4 Control Roo					5. 6. 7. 8.		s Affected				
	DESIG	N DOCUMEN	IT (DD)		C F	1	Crit. Drwg.	Related DCDs (Ref # from	Incorp. Rev. or		
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date	R*	D *		Part 2)	Date Optional		
DWG-C	C502	M-3103	2	E	R	D					
								*			

Reproduced from: NEP-08-01, Issued 9/30/94

<sup>\*&#</sup>x27;C' for Construction or 'R' for Record \*\*'F' for Functional or 'D' for Detailed

## **Back-Up Calculation Listing**

(Part 2)

ECN No. 04-01341M Design Change No.: E04-1-96-023-E Page 3 of 6

Calculation/Analysis No.

Revision No.

Description

XCE042.0323

1

Weld Overlay Repair Design for Quad Cities Unit 1 - Welds 02AS-S6, 02AS-F2, 02AS-S4, 02AD-F12 - 1996 Outage

## CERTIFICATION PAGE

(Part 3)

ECN No. 04-01341M

Design Change No.: E04-1-96-023-E

Page 4 of 6

Station:	Ouad Cities	Affected Unit:	1	Page: _1_ of _1_
	CERTIFICATION OF ECN NO	D. <u>04-01341M</u>	*	
	I certify that this Engineering C and I am a registered Profession			
	Certified by:	4. Bom	Date:	
			Seal	REGISTERED PROFESSIONAL ENGINEER OF

## SUPPORT INFORMATION (Part 4)

ECN No. 04-01341M
Design Change No.: E04-1-96-023-E
Page 5 of 6

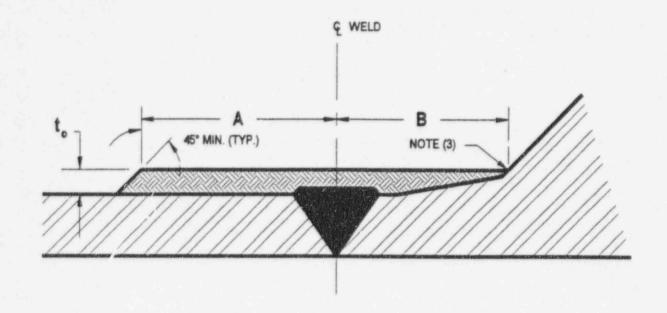
### 4.1 General

Note No.	Description
4.1.1	Weld overlay application shall be in accordance with page 6 of this ECN (Sketch 1598-00044.010-0211) and shall comply with the technical requirements contained in Document No. COE-107-500, Latest Revision.
4.1.2	Detailed joint configuration information and thickness data shall be reported to Engineering prior to application of the overlay.
4.1.3	During weld overlay implementation, the "as-built" configuration shall be recorded on a Weld Overlay Data Sheet as specified in Document No. COE-107-500, Latest Revision.
4.1.4	The base materials to which this WOR is to be applied contain low levels of delta ferrite (<5 FN). In an effort to compensate for the dilution effect this low ferrite material will have on deposited weld metal, it is recommended that the weld filter material used for the first layer be selected on the basis of its ability to produce a deposit meeting the requirements of Document No. COE-107-500 (minimum 7.5 FN as-deposited). For the first layer, it may therefore be necessary to use filler material capable of producing an undiluted weld deposit double the minimum acceptable delta ferrite specified in COE-107-500.

### SUPPORT INFORMATION (Part 4)

 PIPE
 ECN No.: 04-1341M
 PUMP

 Design Charge No.: E04-1-96-023-E
 Page 6 of 6 (Final)
 UPSTREAM



### NOTES:

- (1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.
- (2) "t," is the minimum design thickness.
- (3) Extend overlay toward pump casing as far as possible. "B" dimension need not exceed 4.5". Toe of overlay to blend smoothly into pump transition..

WELD NUMBER		F1 414 6114 64 67 F817 47 64 1		DESIG	N DIMENS	IONS			
		FLAW CHA	ARACTERIZATION	t <sub>o</sub>	Α	В	COMMENTS		
02	ZAD-F12	100% thru w	vall by 360° length	0.49*	4.5"	(3)		3-0313, Rev. 2 ard" Overlay Des	sign
0 ,	1803/25/96	71m 425/96	RPC 3/25/96	OHT 3/25/96	Bu	-3/26/96	Issued fo	or Construction.	
REV. PREP. BY/ CHK. BY/ DATE DATE		P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE		DESCRIPTION			
JOB N	0.: 1598-00044	.010	PLANT/UNIT: Quad Cit	ies Unit 1	-	<b>V</b>		SHT. 1	REV.
FILE NO.: XCE042.0211		SKETCH NO.: 1598-00044.010-0211			VECT	TRA	OF 1	0	



### VECTRA

March 29, 1996 1598-00044.008

Mr. C. Conner
Lead, ComEd Inspections Group
Commonwealth Edison Company
Quad Cities Nuclear Power Station
22710 206th Avenue North
Cordova, IL 61242-9700

Subject:

Quad Cities Nuclear Power Station Unit 1 Weld Overlay Repair of Weldment 02AS-F14

Reactor Recirculation System, 0200

"For Construction" ECN Transmittal Letter

ECN No.: 04-01344M P.O.No.: 351285/YY-238 Function No.: 052306-3171

Dear Mr. Conner:

The purpose of this letter is to transmit "For Construction" the attached Engineering Change Notice (ECN) in accordance with Commonwealth Edison Company's Nuclear Engineering Procedures. The following information related to the ECN is provided:

1. SEC Cognizant Engineer: T. Wojcik

2. Exempt Change Number: E04-1-96-023-G

List of ECNs Contained in Package:

ECN NO. DESCRIPTION

04-01344M Weld Overlay Repair of Weldment 02AS-F14 in

the Reactor Recirculation System.

4. Additional ECNs may be required to complete this exempt change. This ECN may be completed independently of any other work and is being issued as a part of partial exempt change E04-1-96-023-G to support the Station's outage schedule.



5. Required Hardware Procurement Action:

This exempt change does not require any inventory of spare parts. The materials are "Cobalt Free" (<1% Cobalt).

6. ECN Safety Classification:

The ECN is safety related.

Other Related, Open Design Changes:

ComEd Station Central File has been contacted and VECTRA has determined that no open DCDs are related to this exempt change.

- Fabrication of parts may proceed without the receipt of a ComEd approval letter. However, installation activities shall not proceed until a ComEd Authorization Letter is received.
- VECTRA requests that ComEd submit a DCR after the ECN is installed to update the affected design documents.
- 10. Acceptance Criteria/Interfacing Requirements Operability Statement:

Examination and acceptance criteria shall be in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments," Latest Revision. This application document requires the measurement of weld overlay axial shrinkage which is used by Engineering to determine the state of sustained stress at unrepaired weldments in the system. The magnitude of sustained stress within a weldment is used to determine the weldment's NUREG-0313, Revision 2, inspection category/frequency. Changes in piping system stress due to weld overlay repairs is not considered an ASME BPVC load case.

11. Interdisciplinary Review:

An interdisciplinary review (IR) has been conducted on the "For Construction" ECN in accordance with VECTRA's Procedures.

12. Spare Parts List:

No spare parts are required.



- 13. Technical Specification/FSAR/UFSAR Document Review Verification.
  - a. List of Systems Involved:

Reactor Recirculation System 0200

Applicable Tech. Spec/FSAR/UFSAR Sections:

Tech. Spec. Sections 3.6/4.6 FSAR Section 4.3 UFSAR Section 5.4

b. Effects of PDC on Tech. Spec/FSAR/UFSAR Sections:

None

c. If no Tech. Spec/FSAR/UFSAR Sections affected, which Sections were reviewed:

See Item 14 (a)

d. Is PDC Installation Outage related?

Yes (X) No ()

Work may be conducted during the Q1R14 or later outage.

e. Is New Design Compatible with Existing System?

Yes. Weld overlay materials are compatible with the existing piping system. Welding shall be in accordance with ASME Sections IX, XI, and Document No. COE-107-500. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.

#### 14. Other Information:

a. Engineering Synopsis:

Examination of reactor recirculation system weldment 02AS-F14 at Quad Cities Unit 1 has identified intergranular stress corrosion cracking (IGSCC). To ensure the integrity of the weldment and the recirculation piping system, a weld overlay repair will be performed.



The weldment is located on the suction side of recirculation pump 1-0202A on line 1-0202A-28\*-A.

- b. This minor plant change shall be installed in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments", Latest Revision.
- c. Material requirements are specified in Document No. COE-107-500.
- d. All of the equipment and components associated with ECN 04-01344M are safety related. No other interferences or interactions with Safety or Class 1E equipment exist. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.
- e. No interfaces with other A/Es are required.
- 15. No engineering assumptions were used in preparing this ECN.

If you have any questions, please call Rob Choromokos or me at (708) 778-0100, or Carl Froehlich at (408) 629-9800.

Very truly yours,

James A. Brown, P.E.

Project Manager

JAB/lab

Attachment



### Copies:

S. Eldridge - Quad Cities
MOD Design Supervisor - w/1 ECN package

T. Wojcik - Quad Cities SEC Cognizant Engineer - w/1 ECN package

M. Sullivan

Site Construction Superintendent - w/1 ECN package

M. Santic - Quad Cities
System Engineer - w/1 ECN package

T. Dismukes - Quad Cities
Station Central File Supervisor - w/2 ECNs & 1 Silver Aperture

A. Beveroth

SEC DCR Coordinator - w/1 ECN package

G. J. Tagatz - Quad Cities

Design Change Coordinator - w/letter only

A. Lynch - Quad Cities

Materials Management Supervisor - w/1 ECN package

Bob Larken

Site Construction - w/1 ECN package

NETS/CHRON System Supervisor

C. H. Froehlich - w/1 ECN Package

File: 1598-00044.D01 - Letter only

1598-00044.F09 - 1 ECN Package

DTR Book - Letter & ECN Parts 1 & 2

JAB-96-039



### **ENGINEERING CHANGE NOTICE** (Part 1)

## ISSUANCE: [X] FOR CONSTRUCTION [] FOR COMMENT ECN No. 04-01344M

Page \_ 1 of \_ 6

Affected Unit:	Qued Cities  I  riously Approved ECN [ ]	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Project No. (if appl.) 159 Supp ID No. (if appl.) N/A	Design Change No. <u>E04-1-96-023-G</u> Project No. (if appl.) <u>1598-00044</u> Supp ID No. (if appl.) <u>N/A</u> System: <u>0200</u>			
Description of D	esign Change Request:			nation (Advisor Company) and the Company of Company (Company) and			
Weld overla System.	ay repair (WOR) of weldmo	ent 02AS-F14 on line 1-0202	A-28" of the Reactor Re	ecirculation			
intergranula	riay repair will be applied ir stress corrosion cracking	to weldment 02AS-F14 on li (IGSCC).	ne 1-0202A-28 to repai	ır			
Design Group or		INTERFACING COMMENTS by:					
Design Group or Discipline	Name of Commenter (Printed)	Signature of Commenter	Date	C or NC			
Discipline Elect /I&C	NIA						
Discipline  Elect /l&C  Mechanical	D. P. DeGRUSH	Signature of Commenter  N/A  Ward As Greek	3/29/96	NC			
Discipline  Elect /l&C  Mechanical  Structural	N/A D.P. D. GRUSH J.E. NEURAUTER	Signature of Commenter  N/A  Ward Refresh  RE News autes					
Discipline  Elect /l&C  Mechanical  Structural  Weld & Matl.	D. P. DeGRUSH	Signature of Commenter  N/A  Ward As Greek	3/29/96	NC NC			
Design Group or Discipline  Elect /I&C  Mechanical  Structural  Weld & Matl.  Others  Prepared by:	N/A  D. P. DeGRUSH  J.E. NEURAUTER  J. A. BROWN  N/A  V. I M/A	Signature of Commenter  N/A  Ward De Grund  SE Neuranter  9. ABB n  N/A  N/A  Ox. Mad Chauslist or 8	3/29/96 3/29/96 3/29/96	NC NC			

# DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST (Part 2)

Associated With:  ECN - Comment  ECN - Construction  FCR  Other:				DCD Number: 04-01344M								
				Station:	Station: Ouad Cities Unit: 1							
				Plant D	Plant Design Change/Change Authority:  Type: EPC							
					Number: <u>E04-1-96-023-G</u>							
Part 1 - Ger	neral Infor	mation - Option	al for FCR	Date Pr	repared	l:	3/28/96					
A/E: _VO	VE: V006 Project No.: 1598-00044				W.O. or Function No.: 052306-3171							
Originator:	Sie	gel. K.		Organia	zation:			VECTRA Technologies				
Department	:	N/A		_ Phone	No./Ex	t:		(708) 778-42	266			
Description	: Weld o	verlay repair o	of weldmen	t 02AS-F14	4 on lir	ne 1-0	202A-28"	of the Reactor R	ecirculation			
System.												
Part 2 - Re	lated Desig	n Change Dox	cuments (i.	e. ECN. F	CR)							
1 2 3 4 Control Roc			Yes		5. 6. 7. 8.		s Affected	Number				
		N DOCUMEN			C	F /	Crit. Drwg.	Related DCDs (Ref # from	Rev. or			
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date	R*	D *		Part 2)	Date Optional			
DWG-C	C502	M-3103	3	Е	R	D						
	and the same of th				-		1					

\*\*'F' for Functional or 'D' for Detailed

Reproduced from: NEP-08-01, Issued 9/30/94

<sup>\*&#</sup>x27;C' for Construction or 'R' for Record

# Back-Up Calculation Listing (Part 2)

ECN No. 04-01344M

Design Change No.: E04-1-96-023-G

Page 3 of 6

Calculation/Analysis No.

Revision No.

Description

XCE042.0325

0

Weld Overlay Repair Design for Quad Cities Unit 1 - Welds 02AS-S12, 02AS-F14 - 1996 Outage

## **CERTIFICATION PAGE**

(Part 3)

ECN No. 04-01344M

Design Change No.: E04-1-96-023-G

Page 4 of 6

Station:	Ouad Cities	_ Affected Unit:	Page: of
	CERTIFICATION OF ECN N	O. <u>04-01344M</u>	
	I certify that this Engineering (and I am a registered Profession	Change Notice was prepared and Engineer under the leading to the l	ared by me or under my supervision aws of the State of Illinois.
	Certified by:	San	Date: 3/29/96
			Seal PROFESSIONAL ENGINEER OF

## SUPPORT INFORMATION

(Part 4)

ECN No. 04-01344M

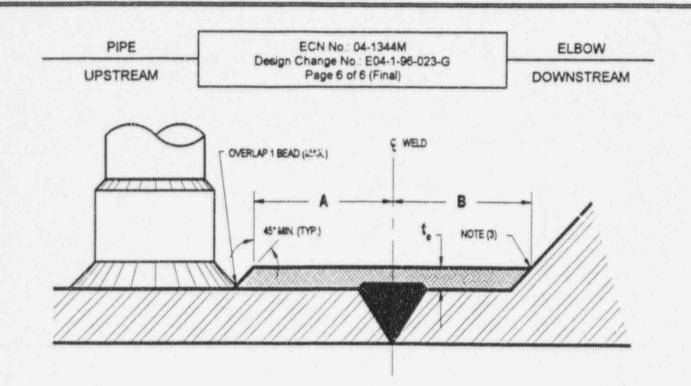
Design Change No.: <u>E04-1-96-023-G</u>
Page <u>5</u> of <u>6</u>

## 4.1 General

Note No.	Description
4.1.1	Weld overlay application shall be in accordance with page 6 of this ECN (Sketch 1598-00044.010-0214) and shall comply with the technical requirements contained in Document No. COE-107-500, Latest Revision.
4.1.2	Detailed joint configuration information and thickness data shall be reported to Engineering prior to application of the overlay.
4.1.3	During weld overlay implementation, the "as-built" configuration shall be recorded on a Weld Overlay Data Sheet as specified in Document No. COE-107-500, Latest Revision.
4.1.4	The base materials to which this WOR is to be applied contain low levels of delta ferrite (<5 FN). In an effort to compensate for the dilution effect this low ferrite material will have on deposited weld metal, it is recommended that the weld filler material used for the first layer be selected on the basis of its ability to produce a deposit meeting the requirements of Document No. COE-107-500 (minimum 7.5 FN as-deposited). For the first layer, it may therefore be necessary to use filler material capable of producing an undiluted weld deposit double the minimum acceptable delta ferrite specified in COE-107-500.

## SUPPORT INFORMATION

(Part 4)



### NOTES:

- (1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.
- (2) "t," is the minimum required design thickness.
- (3) Extend overlay toward elbow and branch line as far as possible. "A" and "B" dimensions need not exceed 4.5". "A" dimension shall not be less than 2.5". Toe of overlay to blend smoothly into elbow transition.

		ARACTERIZATION DESIG		DIMENS	SIONS	000005070				
		ARACTERIZATION	t <sub>o</sub>	Α	В	COMMENTS				
		all by 360° length 0.48°		(3) (3)		NUREG-0313, Rev. 2 "Standard" Overlay Design				
0	8 H3/29/2	75M 3/29/96	RPL 3/29/96	000 3/29/96	B	3/29/96	issued fo	or Constru	ction.	
REV. PREP. BY/ DATE DATE		P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE		DESCRIPTION				
JOB N	O.: 1598-00044	.010	PLANT/UNIT:  Quad Cit	ies Unit 1	-	<b>V</b>		SHT.	1	REV.
FILE NO.: XCE042.0214		SKETCH NO.: 1598-00044.010-0214		VECT		TRA OF 1		0		



## VECTRA

March 29, 1996 1598-00044.007

Mr. C. Conner
Lead, ComEd Inspections Group
Commonwealth Edison Company
Quad Cities Nuclear Power Station
22710 206th Avenue North
Cordova, IL 61242-9700

Subject:

Quad Cities Nuclear Power Station Unit 1 Weld Overlay Repair of Weldment 02AS-S12

Reactor Recirculation System, 0200

"For Construction" ECN Transmittal Letter

ECN No.: 04-01345M P.O.No.: 351285/YY-238 Function No.: 052306-3171

Dear Mr. Conner:

The purpose of this letter is to transmit "For Construction" the attached Engineering Change Notice (ECN) in accordance with Commonwealth Edison Company's Nuclear Engineering Procedures. The following information related to the ECN is provided:

1. SEC Cognizant Engineer: T. Wojcik

Exempt Change Number: E04-1-96-023-F

List of ECNs Contained in Package:

ECN NO. DESCRIPTION

04-01345M Weld Overlay Repair of Weldment 02AS-S12 in

the Reactor Recirculation System.

4. Additional ECNs may be required to complete this exempt change. This ECN may be completed independently of any other work and is being issued as a part of partial exempt change E04-1-96-023-F to support the Station's outage schedule.



5. Required Hardware Procurement Action:

This exempt change does not require any inventory of spare parts. The materials are "Cobalt Free" (<1% Cobalt).

6. ECN Safety Classification:

The ECN is safety related.

7. Other Related, Open Design Changes:

ComEd Station Central File has been contacted and VECTRA has determined that no open DCDs are related to this exempt change.

- Fabrication of parts may proceed without the receipt of a ComEd approval letter. However, installation activities shall not proceed until a ComEd Authorization Letter is received.
- VECTRA requests that ComEd submit a DCR after the ECN is installed to update the affected design documents.
- 10. Acceptance Criteria/Interfacing Requirements Operability Statement:

Examination and acceptance criteria shall be in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments," Latest Revision. This application document requires the measurement of weld overlay axial shrinkage which is used by Engineering to determine the state of sustained stress at unrepaired weldments in the system. The magnitude of sustained stress within a weldment is used to determine the weldment's NUREG-0313, Revision 2, inspection category/frequency. Changes in piping system stress due to weld overlay repairs is not considered an ASME BPVC load case.

11. Interdisciplinary Review:

An interdisciplinary review (IR) has been conducted on the "For Construction" ECN in accordance with VECTRA's Procedures.

12. Spare Parts List:

No spare parts are required.



- 13. Technical Specification/FSAR/UFSAR Document Review Verification.
  - a. List of Systems Involved:

Reactor Recirculation System 0200

Applicable Tech. Spec/FSAR/UFSAR Sections:

Tech. Spec. Sections 3.6/4.6 FSAR Section 4.3 UFSAR Section 5.4

b. Effects of PDC on Tech. Spec/FSAR/UFSAR Sections:

None

c. If no Tech. Spec/FSAR/UFSAR Sections affected, which Sections were reviewed:

See Item 14 (a)

d. Is PDC Installation Outage related?

Yes (X) No ()

Work may be conducted during the Q1R14 or later outage.

e. Is New Design Compatible with Existing System?

Yes. Weld overlay materials are compatible with the existing piping system. Welding shall be in accordance with ASME Sections IX, XI, and Document No. COE-107-500. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.

#### 14. Other Information:

a. Engineering Synopsis:

Examination of reactor recirculation system weldment 02AS-S12 at Quad Cities Unit 1 has identified intergranular stress corrosion cracking (IGSCC). To ensure the integrity of the weldment and the recirculation piping system, a weld overlay repair will be performed.



The weldment is located on the suction side of recirculation pump 1-0202A on line 1-0202A-28"-A.

- b. This minor plant change shall be installed in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments", Latest Revision.
- c. Material requirements are specified in Document No. COE-107-500.
- d. All of the equipment and components associated with ECN 04-01345M are safety related. No other interferences or interactions with Safety or Class 1E equipment exist. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.
- e. No interfaces with other A/Es are required.
- 15. No engineering assumptions were used in preparing this ECN.

If you have any questions, please call Rob Choromokos or me at (708) 778-0100, or Carl Froehlich at (408) 629-9800.

Very truly yours,

James A. Brown, P.E.

Project Manager

JAB/lab

Attachment



#### Copies:

S. Eldridge - Quad Cities MOD Design Supervisor - w/1 ECN package

T. Wojcik - Quad Cities SEC Cognizant Engineer - w/1 ECN package

M. Sullivan

Site Construction Superintendent - w/1 ECN package

M. Santic - Quad Cities

System Engineer - w/1 ECN package

T. Dismukes - Quad Cities

Station Central File Supervisor - w/2 ECNs & 1 Silver Aperture

A. Beveroth

SEC DCR Coordinator - w/1 ECN package

G. J. Tagatz - Quad Cities

Design Change Coordinator - w/letter only

A. Lynch - Quad Cities

Materials Management Supervisor - w/1 ECN package

Bob Larken

Site Construction - w/1 ECN package

NETS/CHRON System Supervisor

C. H. Froehlich - w/1 ECN Package

File: 1598-00044.D01 - Letter only

1598-00044.F09 - 1 ECN Package

DTR Book - Letter & ECN Parts 1 & 2

JAB-96-038



### ENGINEERING CHANGE NOTICE

(Part 1)

## ISSUANCE: [X] FOR CONSTRUCTION [] FOR COMMENT BCN NO. 04-01345M

Page 1 of 6

·					
Station:  Affected Unit:  Changes to a previ	The state of the s	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. E04-1 Project No. (if appl.) 15 Supp ID No. (if appl.) N/ System: 020	pl.)	
Description of De	sign Change Request:			THE RESERVE OF THE PARTY OF THE	
Weld overla System.	y repair (WOR) of weldme	ent 02AS-S12 on line 1-0202A	-28" of the Reactor R	Recirculation	
Reason for Design	Change: Change and action required	(Provide reason for change, specific actions	required attach supporting documents	news as applicable)	
A weld over intergranular	lay repair will be applied to stress corrosion cracking	to weldment 02AS-S12 on line (IGSCC).	to repa	ir	
		INTERFACING COMMENTS by:			
Design Group or Discipline	Name of Commenter (Printed)	Signature of Commenter	Date	C or NC	
Elect./I&C	NIA	NIA			
Mechanical	D. P. DE GRUSH	Baid Cethank	3/29/96	NC	
Structural	J. E. NEURAUTER	8 E neuranter	3/29/96	×	
Weld & Matl.	J. A. BROWN	9 E Neuranter	3/29/96	NC	
Others	NA	N/A			
Prepared by: 2	1 /2-	1 Meles Chaqueline or 60	Approved by: 200 /200	1/96	
	documents revised by (date):	Date:			

# DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST (Part 2)

Asso	ciated Wi	th:		DCD N	Number	r:	04-0134	5M			
	ECN -	Comment		Station	Qu	ad C	ities	Unit: _1			
180	ECN -	Construction		Plant Design Change/Change Authority:							
	FCR				Type: EPC						
	Other:					Nun	ber:E	04-1-96-023-F			
Part 1 - Ger	neral Infor	mation - Option	nal for FCR	Date P	repared	1:	3/28/96	5			
A/E:V00	06_ Proj	ect No.: _15	598-00044	_ w.o. g	r Fund	ction	No.: _0	52306-3171			
Originator:	Sig	egel, K.		Organia	zation:	-		VECTRA Techno	logies		
Department	:	N/A		_ Phone	No./Ex	ct:		(708) 778-42	266		
Description	Weld o	verlay repair o	of weldmer	nt 02AS-S12	on lin	ne 1-(	0202A-28	of the Reactor F	ecirculation		
System.											
Part 2 - Rel	ated Desig	n Change Dox	cuments (i.	e. ECN. F	CR)						
1 2 3 4 Control Roc	fected De		ts		6. 7. 8. P	********	s Affected	And the second s	_No		
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date	R*	D *	DIWG.	Part 2)	Date Optional		
DWG-C	C502	M-3103	3	Е	R	D					
		A STATE OF THE PARTY OF THE PAR	1		THE REAL PROPERTY AND ADDRESS OF THE PERSON		1				

Reproduced from: NEP-08-01, Issued 9/30/94

<sup>\*&#</sup>x27;C' for Construction or 'R' for Record

<sup>\*\*&#</sup>x27;F' for Functional or 'D' for Detailed

# Back-Up Calculation Listing (Part 2)

ECN No. <u>04-01345M</u> Design Change No.: <u>E04-1-96-023-F</u>

Page \_ 3 of \_ 6

Calculation/Analysis No.

XCE042.0325

Revision No.

0

Description

Weld Overlay Repair Design for Quad Cities Unit 1 - Welds 02AS-S12, 02AS-F14 - 1996 Outage

## SUPPORT INFORMATION

(Part 4)

ECN No. <u>04-01345M</u>
Design Change No.: <u>E04-1-96-023-F</u>
Page <u>5</u> of <u>6</u>

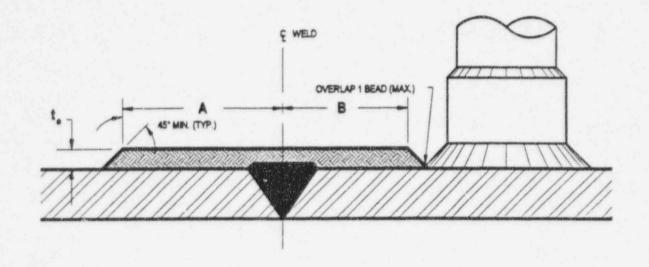
#### 4.1 General

lote No.	Description
4.1.1	Weld overlay application shall be in accordance with page 6 of this ECN (Sketch 1598-00044.010-0213) and shall comply with the technical requirements contained in Document No. COE-107-500, Latest Revision.
4.1.2	Detailed joint configuration information and thickness data shall be reported to Engineering prior to application of the overlay.
4.1.3	During weld overlay implementation, the "as-built" configuration shall be recorded of a Weld Overlay Data Sheet as specified in Document No. COE-107-500, Latest Revision.
4.1.4	The base materials to which this WOR is to be applied contain low levels of delta ferrite (<5 FN). In an effort to compensate for the dilution effect this low ferrite material will have on deposited weld metal, it is recommended that the weld filler material used for the first layer be selected on the basis of its ability to produce a deposit meeting the requirements of Document No. COE-107-500 (minimum 7.5 FN as-deposited). For the first layer, it may therefore be necessary to use filler material capable of producing an undiluted weld deposit double the minimum acceptable delta ferrite specified in COE-107-500.

#### SUPPORT INFORMATION (Part 4)

 ELBOW
 ECN No.: 04-01345M
 PIPE

 Design Change No.: E04-1-96-023-F
 DOWNSTREAM



#### NOTES:

- (1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.
- (2) "t," is the minimum required design thickness.
- (3) Extend overlay toward branch line as far as possible. "B" dimension need not exceed 4.5" nor shall be less than 2.5".

					N DIMENS	SIONS	COMMENTS		
WEL	D NUMBER	FLAW CH	ARACTERIZATION	to	Α	В			
02	2AS-S12	100% thru w	all by 360° length	0.50*	4.5*	(3)		3-0313, Rev. 2 ard" Overlay De	sign
0	1 1/29/16	74m 3/24/96	RPC 3/29/9C	CHF 3/25/96	Bu	3/29/96	Issued fo	or Construction.	
REV.	PREP BY/	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE		P.M. APPR./ DATE		DESCRIPTION	٧
JOB N	1598-00044	.010	PLANT/UNIT: Quad Ci	ties Unit 1		<b>V</b>		SHT. 1	REV.
FILE NO.: XCE042.0213		SKETCH NO.: 1598-0004	4.010-0213		VECT	RA	OF 1	0	



VECTRA April 2, 1996 1598-00044.013

Mr. C. Conner Lead, ComEd Inspections Group Commonwealth Edison Company Quad Cities Nuclear Power Station 22710 206th Avenue North Cordova, IL 61242-9700

Subject:

Quad Cities Nuclear Power Station Unit 1 Weld Overlay Repair of Weldment 02BS-F14

Reactor Recirculation System, 0200

"For Construction" ECN Transmittal Letter

ECN No.: 04-01346M P.O.No.: 351285/YY-238 Function No.: 052306-3171

Dear Mr. Conner:

The purpose of this letter is to transmit "For Construction" the attached Engineering Change Notice (ECN) in accordance with Commonwealth Edison Company's Nuclear Engineering Procedures. The following information related to the ECN is provided:

SEC Cognizant Engineer: T. Wojcik

2. Exempt Change Number: E04-1-96-023-H

3. List of ECNs Contained in Package:

ECN NO. DESCRIPTION

04-01346M Weld Overlay Repair of Weldment 02BS-F14 in

the Reactor Recirculation System.

4. Additional ECNs may be required to complete this exempt change. This ECN may be completed independently of any other work and is being issued as a part of partial exempt change E04-1-96-023-H to support the Station's outage schedule.



5. Required Hardware Procurement Action:

This exempt change does not require any inventory of spare parts. The materials are "Cobalt Free" (<1% Cobalt).

6. ECN Safety Classification:

The ECN is safety related.

7. Other Related, Open Design Changes:

ComEd Station Central File has been contacted and VECTRA has determined that no open DCDs are related to this exempt change.

- Fabrication of parts may proceed without the receipt of a ComEd approval letter. However, installation activities shall not proceed until a ComEd Authorization Letter is received.
- VECTRA requests that ComEd submit a DCR after the ECN is installed to update the affected design documents.
- 10. Acceptance Criteria/Interfacing Requirements Operability Statement:

Examination and acceptance criteria shall be in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments," Latest Revision. This application document requires the measurement of weld overlay axial shrinkage which is used by Engineering to determine the state of sustained stress at unrepaired weldments in the system. The magnitude of sustained stress within a weldment is used to determine the weldment's NUREG-0313, Revision 2, inspection category/frequency. Piping system stress due to weld overlay repairs is not considered an ASME BPVC load case.

11. Interdisciplinary Review:

An interdisciplinary review (IR) has been conducted on the "For Construction" ECN in accordance with VECTRA's Procedures.

12. Spare Parts List:

No spare parts are required.



- 13. Technical Specification/FSAR/UFSAR Document Review Verification.
  - a. List of Systems Involved:

Reactor Recirculation System 0200

Applicable Tech. Spec/FSAR/UFSAR Sections:

Tech. Spec. Sections 3.6/4.6 FSAR Section 4.3 UFSAR Section 5.4

b. Effects of PDC on Tech. Spec/FSAR/UFSAR Sections:

None

c. If no Tech. Spec/FSAR/UFSAR Sections affected, which Sections were reviewed:

See Item 14 (a)

d. Is PDC Installation Outage related?

Yes (X) No ()

Work may be conducted during the Q1R14 or later outage.

e. Is New Design Compatible with Existing System?

Yes. Weld overlay materials are compatible with the existing piping system. Welding shall be in accordance with ASME Sections IX, XI, and Document No. COE-107-500. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.

#### 14. Other Information:

a. Engineering Synopsis:

Examination of reactor recirculation system weldment 02BS-F14 at Quad Cities Unit 1 has identified intergranular stress corrosion cracking (IGSCC). To ensure the integrity of the weldment and the recirculation piping system, a weld overlay repair will be performed.



The weldment is located on the suction side of recirculation pump 1-0202B on line 1-0202B-28"-A.

- b. This minor plant change shall be installed in accordance with Document No. COE-107-500, "Technical Requirements for the Application and Examination of Weld Overlay Repairs to Austenitic Stainless Steel Weldments", Latest Revision.
- Material requirements are specified in Document No. COE-107-500.
- d. All of the equipment and components associated with ECN 04-01346M are safety related. No other interferences or interactions with Safety or Class 1E equipment exist. Weld overlay axial shrinkage will be evaluated by Engineering, see item 10.
- e. No interfaces with other A/Es are required.
- 15. No engineering assumptions were used in preparing this ECN.

If you have any questions, please call Rob Choromokos or me at (708) 778-0100, or Carl Froehlich at (408) 629-9800.

Very truly yours,

James A. Brown, P.E.

amu Alion

Project Manager

JAB/lab

Attachment.



#### Copies:

S. Eldridge - Quad Cities

MOD Design Supervisor - w/1 ECN package

T. Wojcik - Quad Cities

SEC Cognizant Engineer - w/1 ECN package

M. Sullivan - Quad Cities

Site Construction Superintendent - w/1 ECN package

M. Santic - Quad Cities

System Engineer - w/1 ECN package

T. Dismukes - Quad Cities

Station Central File Supervisor - w/2 ECNs & 1 Silver Aperture

A. Beveroth - Quad Cities

SEC DCR Coordinator - w/1 ECN package

G. J. Tagatz - Quad Cities

Design Change Coordinator - w/letter only

A. Lynch - Quad Cities

Materials Management Supervisor - w/1 ECN package

Bob Larken - Quad Cities

Site Construction - w/1 ECN package

NETS/CHRON System Supervisor

C. H. Froehlich - w/1 ECN Package

File: 1598-00044.D01 - Letter only

1598-00044.F09 - 1 ECN Package

DTR Book - Letter & ECN Parts 1 & 2

JAB-96-040



# **ENGINEERING CHANGE NOTICE**

(Part 1)

### ISSUANCE: [X] FOR CONSTRUCTION [] FOR COMMENT ECN NO. 04-01346M

Page \_ 1 of \_ 6

Affected Unit:	Ouad Cities iously Approved ECN [ ]	[X] Safety Related   Design Change No. <u>E04-1-96-023-H</u> [] Non-Safety Related   Project No. (if appl.) <u>1598-00044</u> [] Regulatory   Supp ID No. (if appl.) <u>N/A</u> System: <u>0200</u>					
	sign Change Request: y repair (WOR) of weldme	ent 02BS-F14 on line 1-0202B-2	28" of the Reactor R	ecirculation			
A weld over							
		INTERFACING COMMENTS by:					
Design Group or	Name of Commenter (Printed)	Signature of Commenter	Date	CorNC			
Discipline	Name of Commenter (Printed)	Signsture of Commenter	Date	C or NC			
	Name of Commenter (Printed)  N/A  Pavzo De Gaush	Signature of Commenter  N/A  And While	1/2/9C	C or NC			
Discipline Elect./l&C	N/A	And Cethal,	1/2/96 4/2/96				
Discipline  Elect./I&C  Mechanical	N/A PAVED DE GRUSH	And Cethal,	1/2/96 4/2/96 4/2/96	NC			
Discipline  Elect./I&C  Mechanical  Structural	N/A PAVED DE GRUSH CHARLES E. PROKUSK	Deful CEP whushi	4/2/96	NC NC			
Discipline  Elect./l&C  Mechanical  Structural  Weld & Matl.	N/A PAVED DE GRUSH CHARLES E. PROKUSK J. A. BROWN N/A  MK C ON Review by	N/A Rog Cethol CEP sopushi Jam ABn N/A	4/2/96	NC NC			

#### DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST (Part 2)

Asso	ciated Wi	th:		DCD N	Number		04-0134	6M				
	ECN -	Comment		Station	: Ou	ad C	ties	Unit: _1				
<b>X</b>	ECN -	Construction		Plant I	Design	Chan	ge/Change	Authority:				
	FCR					Туре	:	EPC				
	Other:			Number: E04-1-96-023-H								
Part 1 - Ger	neral Info	rmation - Option	al for FCR	Date P	repared	l:	4/02/96	5				
A/E:VO	06 Proj	ect No.:15	98-00044	W.O. g	W.O. or Function No.: 052306-3171							
Originator:	Si	ezel, K.		Organi	zation:	-	,	VECTRA Techno	logies			
Department	:	N/A		Phone	No./Ex	ct:		(708) 778-42	266			
					4 on li	ne 1-	0202B-28*	of the Reactor R	Recirculati			
		gn Change Doo		e ECN. F	FCR)							
1	Туре		Number		6.			Numbe				
4		-			8.							
		ngs Affected? sign Documen		_X_No	P	& ID (optio		l:YesX	No			
	DESIG	N DOCUMEN	TT (DD)		C		Crit. Drwg.	Related DCDs (Ref # from	Incorp. Rev. or			
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date	R*	D *		Part 2)	Date Optional			
DWG-C	C502	M-3103	3	E	R	D						

Reproduced from: NEP-08-01, Issued 9/30/94

<sup>\*&#</sup>x27;C' for Construction or 'R' for Record \*\*'F' for Functional or 'D' for Detailed

# **Back-Up Calculation Listing**

(Part 2)

ECN No. 04-01346M

Design Change No.: E04-1-96-023-H

Page 3 of 6

Calculation/Analysis No.

Revision No.

Description

XCE042.0324

0

Weld Overlay Repair Design for Quad Cities Unit 1 - Weld 02BS-F14 - 1996

Outage

### **CERTIFICATION PAGE**

(Part 3)

ECN No. <u>04-01346M</u>
Design Change No.: <u>E04-1-96-023-H</u>
Page <u>4</u> of <u>6</u>

Station:	Quad Cities	Affected Unit:	. 1	Page:1_ of _1_
	CERTIFICATION OF ECN	NO. <u>04-01346M</u>		
	I certify that this Engineering and I am a registered Profess	Change Notice was prepional Engineer under the	pared by me o laws of the S	r under my supervision tate cf Illinois.
	Certified by: James 41	Bon	Date:	4/2/96
			Seal	O62 040931 REGISTERED PROFESSIONAL ENGINEER OF

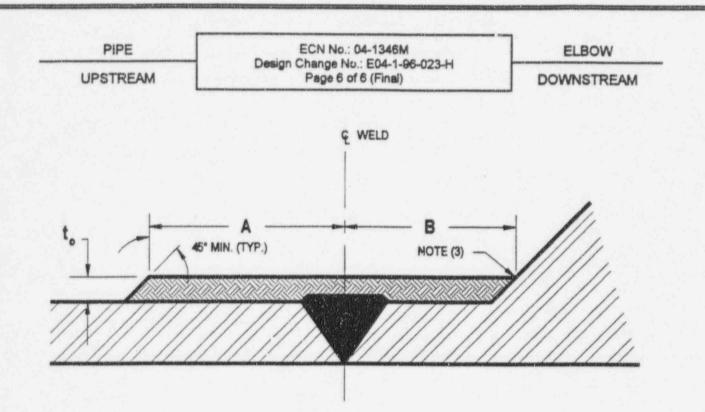
# SUPPORT INFORMATION (Part 4)

ECN No. 04-01346M
Design Change No.: E04-1-96-023-H
Page 5 of 6

#### 4.1 General

Note No.	Description
4.1.1	Weld overlay application shall be in accordance with page 6 of this ECN (Sketch 1598-00044.010-0212) and shall comply with the technical requirements contained in Document No. COE-107-500, Latest Revision.
4.1.2	Detailed joint configuration information and thickness data shall be reported to Engineering <u>prior</u> to application of the overlay.
4.1.3	During weld overlay implementation, the "as-built" configuration shall be recorded on a Weld Overlay Data Sheet as specified in Document No. COE-107-500, Latest Revision.
4.1.4	The base materials to which this WOR is to be applied contain low levels of delta ferrite (<5 FN). In an effort to compensate for the dilution effect this low ferrite material will have on deposited weld metal, it is recommended that the weld filler material used for the first layer be selected on the basis of its ability to produce a deposit meeting the requirements of Document No. COE-107-500 (minimum 7.5 FN as-deposited). For the first layer, it may therefore be necessary to use filler material capable of producing an undiluted weld deposit double the minimum acceptable delta ferrite specified in COE-107-500.

# SUPPORT INFORMATION (Part 4)



#### NOTES:

- (1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.
- (2) "t," is the minimum required design thickness.
- (3) Extend overlay toward elbow as far as possible. "B" dimension need not exceed 4.5". Toe of overlay to blend smoothly into elbow transition.

NA/EL	D AH IMPER			DESIGN	DIMENS	SIONS				
VVEL	D NUMBER	FLAW CH	ARACTERIZATION	t,	Α	В		COMN	MENTS	
02	BS-F14	100% thru v	vall by 380° length	0.43*	4.5"	(3)	NUREG-0313, Rev. 2 "Standard" Overlay Design		ign	
0	700 4/1/96	Tsm 4/1/96	APC 4/1/96	CHJ 4/1/96	Ben	-4/2/96	Issued fo	or Constru	iction.	
REV.			E.M. APPR./	P.M	. APPR./ DATE		DESCR	RIPTION		
JOB NO	0.: 1598-00044	.010	PLANT/UNIT: Quad Citi	es Unit 1	-	<b>V</b>		SHT.	1	REV.
FILE NO.: XCE042.0212		SKETCH NO.: 1598-00044	4.010-0212	VECTRA		OF	1	0		

Attachment 2