Commonwealth Edison Company
Quad Cities Generating Station
22710 206th Avenue North
Cordova, IL 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: Quad 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

[1] Weldment was evaluated as acceptable for continued service without repair.

A001
1/1

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.

Question 2) **What is the population of Category D Welds?**

Response 2) The total population count for Category D welds in Quad Cities Unit 1 is seven (7) welds. 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,

E. S. Kraft, Jr.
Site Vice President

Attachments (1) Engineering Change Notices
(2) Engineering Calculations

cc: H. J. Miller, Regional Administrator - RIII (without attachments)
R. M. Pulsifer, 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. Singer, MidAmerican Energy Company (without attachments)

Attachment 1

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

3. 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.

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.

9. 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 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.
Project Manager

JAB/lab

Attachment

VECTRA

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

VECTRA

ENGINEERING CHANGE NOTICE
(Part 1)

ISSUANCE: [X] FOR CONSTRUCTION [ ] FOR COMMENT

ECN No. 04-01333M

Station: Quad Cities Affected Unit: 1 Changes to a previously Approved ECN [ ]	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. P04-1-96-073-A Project No. (if appl.) 1598-00044 Supp ID No. (if 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)	Signature of Commenter	Date	C or NC
Elect./I&C	LARRY P. LAWRENCE		3/21/96	NC
Mechanical	DAVID P. DeGRUSH		3/21/96	NC
Structural	CHARLES E. PROKUSKI		3/21/96	NC
Weld & Matl.	JAMES A. BROWN		3/21/96	NC
Others				

Prepared by: _____ Date: 3/21/96

Review by: _____ C or NC Date: 3-21-96

Approved by: _____ Date: 3/21/96

All affected design documents revised by (date): _____

Verified by: _____ Date: _____

DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST
(Part 2)

Associated With:

☐ ECN - Comment

☒ ECN - Construction

☐ FCR

☐ Other:

DCD Number: 04-01333M

Station: Quad Cities Unit: 1

Plant Design Change/Change Authority:

Type: EPC

Number: E04-1-96-023-A

Part 1 - General Information - Optional for FCR

Date Prepared: 3/16/96

A/E: V006 Project No.: 1598-00044

W.O. or Function No.: 052306-3171

Originator: Siegel, K.

Organization: VECTRA Technologies

Department: N/A

Phone No./Ext: (708) 778-4266

Description: Weld overlay repair of weldment 02BS-S12 on line 1-0202B-28" of the Reactor Recirculation System.

Part 2 - Related Design Change Documents (i.e., ECN, FCR)

Ref. No.	Type	Number	Ref. No.	Type	Number
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Control Room Drawings Affected? ____Yes __X__No

P & IDs Affected: ____Yes __X__No (optional)

Part 3 - Affected Design Documents

DESIGN DOCUMENT (DD)					C / R*	F / D **	Crit. Drwg.	Related DCDs (Ref # from Part 2)	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date					
DWG-C	C502	M-3103	3	E	R	D			

*'C' for Construction or 'R' for Record

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

Back-Up Calculation Listing
(Part 2)

Calculation/Analysis No.	Revision No.	Description
XCE042.0322	0	Weld Overlay Repair Design for Quad Cities Unit 1, Weld 02BS-S12 - 1996 Outage

CERTIFICATION PAGE
(Part 3)

ECN No. 04-01333M
Design Change No.: E04-1-96-023-A
Page 4 of 9

Station: Quad Cities Affected Unit: 1 Page: 1 of 1

CERTIFICATION OF ECN NO. 04-01333M

I certify that this Engineering Change Notice was prepared by me or under my supervision and I am a registered Professional Engineer under the laws of the State of Illinois.

Certified by: James A. Brown Date: 3/21/96

Seal

SUPPORT INFORMATION
(Part 4)

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.

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.

4.2.4 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.

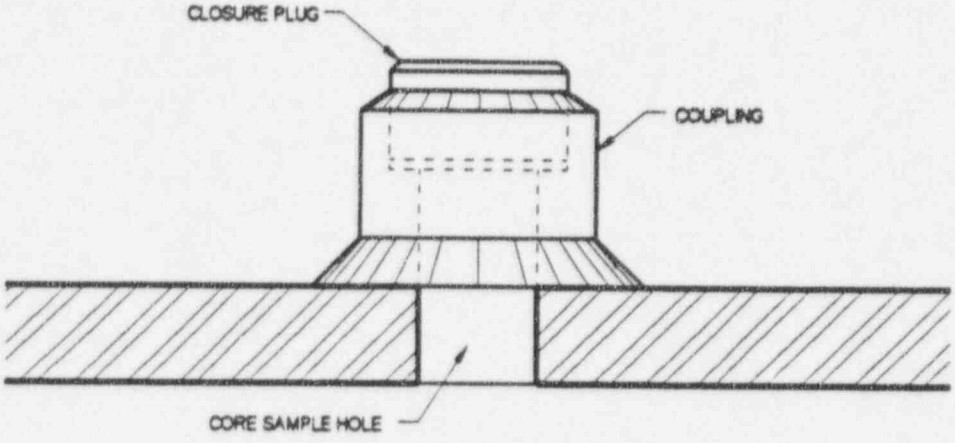
SUPPORT INFORMATION
(Part 4)

4.2.7 The GTAW process, if used, shall be performed with welding grade (or better) argon shielding gas. Post weld heat treatment is not permitted for this repair.

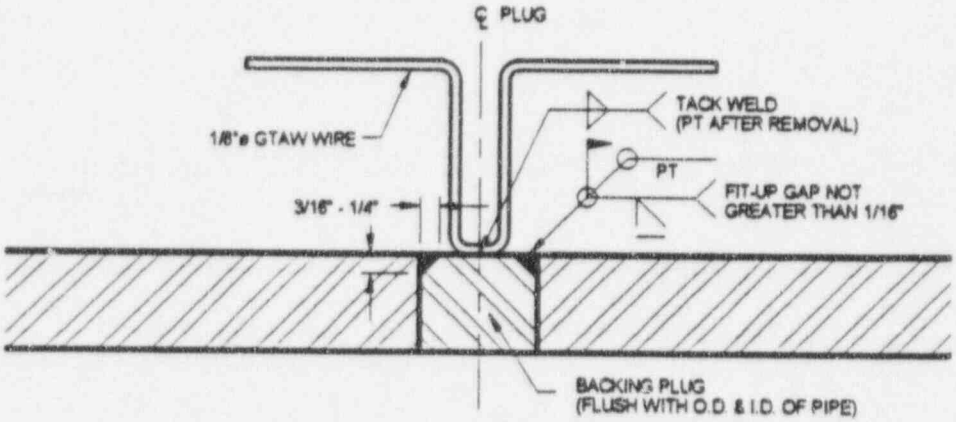
4.2.8 All machined backing plug surfaces (prior to welding), the installation seal weld, and the affected backing plug area after removal of the temporary handling device, shall be PT examined in accordance with station-approved procedures meeting the acceptance criteria of ASME Code Section III, Articles 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.

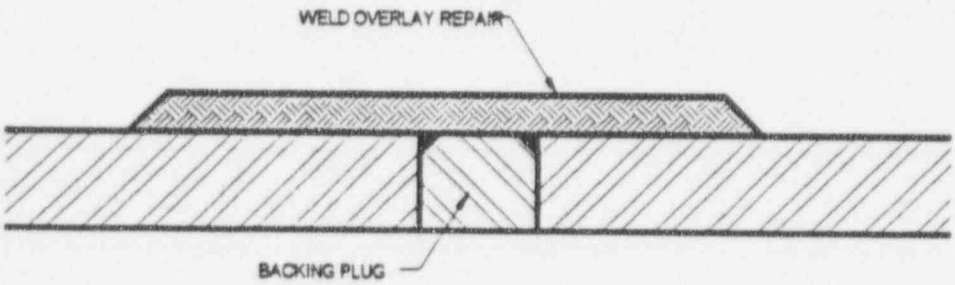
4.2.10 The repairs shall be documented on a Code Data Report (NIS-2 or equivalent).



TYPICAL PLUG CONNECTION DETAIL
(TYPICAL 2 PLACES)



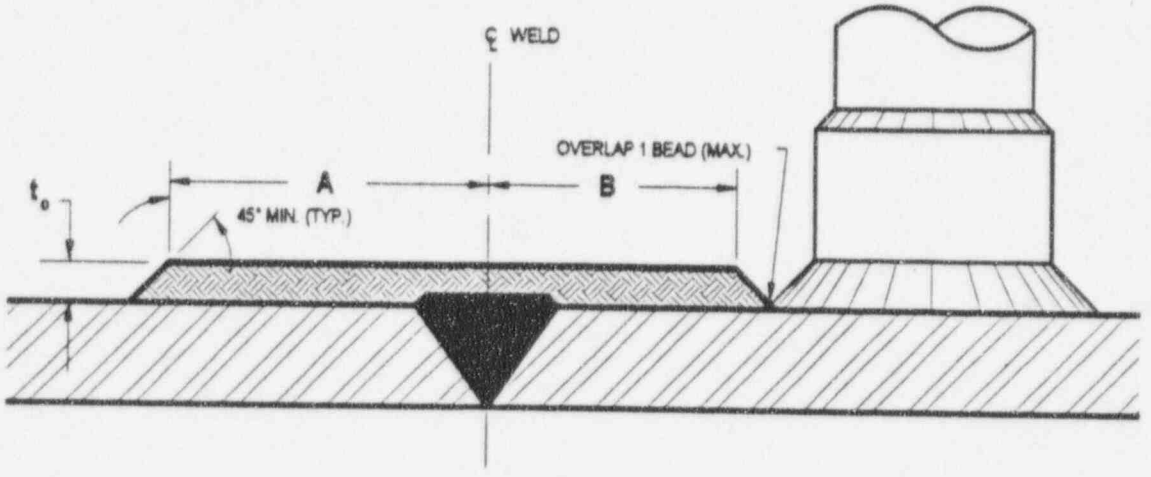
BACKING PLUG INSTALLATION DETAIL



AFTER WELD OVERLAY REPAIR

SUPPORT INFORMATION
(Part 4)

ELBOW / UPSTREAM	ECN No.: 04-01333M Design Change No.: E04-1-96-023-A Page 9 of 9 (Final)	PIPE / DOWNSTREAM



NOTES:

(1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.

(2) "t_o" 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 CHARACTERIZATION	DESIGN DIMENSIONS			COMMENTS
		t_o	A	B	
02BS-S12	100% thru wall by 360° length	0.41"	4.5"	(3)	NUREG-0313, Rev. 2 "Standard" Overlay Design

REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE	DESCRIPTION
0	[illegible] 3/21/96	KM 3/21/96	[illegible] 3/21/96	[illegible] 3/21/96	[illegible] 3/21/96	Issued for Construction.

JOB NO.:	PLANT/UNIT:			REV.
1598-00044.010	Quad Cities Unit 1	VECTRA	SHT. 1 OF 1	0
FILE NO.: XCE042.0207	SKETCH NO.: 1598-00044.010-0207			

VECTRA

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:

1. SEC Cognizant Engineer: T. Wojcik

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

3. 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.

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.

9. 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.

c. 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.
Project Manager

JAB/lab

Attachment

VECTRA

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

VECTRA

ENGINEERING CHANGE NOTICE
(Part 1)

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

Station: Quad Cities Affected Unit: 1 Changes to a previously Approved ECN [ ]	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. E04-1-96-023-B Project No. (if appl.) 1598-00044 Supp ID No. (if appl.) N/A System: 0200

Description of Design Change Request:

Weld overlay repair (WOR) of weldment 02AS-S6 on line 1-0202A-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 02AS-S6 on line 1-0202A-28" to repair intergranular stress corrosion cracking (IGSCC).

INTERFACING COMMENTS by:

Design Group or Discipline	Name of Commenter (Printed)	Signature of Commenter	Date	C or NC
Elect./I&C	N/R	N/R	N/R	
Mechanical	DAVE DEGRUSH	P. Chaconas for DPD VIA TELECON	3/23/96	NC
Structural	C.E. PROKUSKI	C E P rahoski	3/23/96	NC
Weld & Matl.	J. A. BROWN	J. A. Brown	3/23/96	NC
Others				

Prepared by: T E Diamond 3/23/96 Date: 3/23/96

Review by: Robert Chancellor C or NC Date: 3/23/96

Approved by: J. A. Brown Date: 3/23/96

All affected design documents revised by (date): _____

Verified by: _____ Date: _____

DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST
(Part 2)

Associated With:

☐ ECN - Comment

☒ ECN - Construction

☐ FCR

☐ Other:

DCD Number: 04-01337M

Station: Quad Cities Unit: 1

Plant Design Change/Change Authority:

Type: EPC

Number: E04-1-96-023-B

Part 1 - General Information - Optional for FCR

Date Prepared: 3/21/96

A/E: V006 Project No.: 1598-00044

W.O. or Function No.: 052306-3171

Originator: Siegel, K. Organization: VECTRA Technologies

Department: N/A Phone No./Ext: (708) 778-4266

Description: Weld overlay repair of weldment 02AS-S6 on line 1-0202A-28" of the Reactor Recirculation System.

Part 2 - Related Design Change Documents (i.e., ECN, FCR)

Ref. No.	Type	Number	Ref. No.	Type	Number
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Control Room Drawings Affected? ____Yes __X__No P & IDs Affected: ____Yes __X__No (optional)

Part 3 - Affected Design Documents

DESIGN DOCUMENT (DD)					C / R*	F / D **	Crit. Drwg.	Related DCDs (Ref # from Part 2)	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date					
DWG-C	C502	M-3103	3	E	R	D			

*'C' for Construction or 'R' for Record

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

Back-Up Calculation Listing
(Part 2)

Calculation/Analysis No.	Revision No.	Description
XCE042.0323	0	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.: E04-1-96-023-B
Page 4 of 6

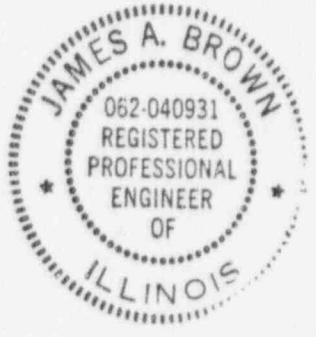
Station: Quad Cities Affected Unit: 1 Page: 1 of 1

CERTIFICATION OF ECN NO. 04-01337M

I certify that this Engineering Change Notice was prepared by me or under my supervision and I am a registered Professional Engineer under the laws of the State of Illinois.

Certified by: James A Brown Date: 3/23/96

Seal



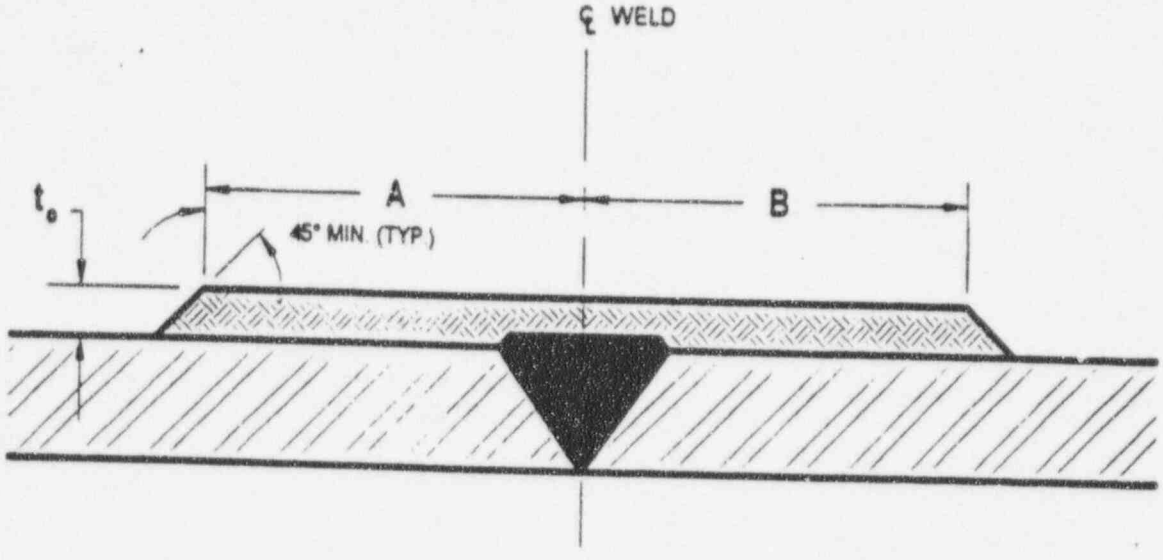
SUPPORT INFORMATION
(Part 4)

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 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)

PIPE UPSTREAM	ECN No.: 04-1337M Design Change No.: E04-1-96-023-B Page 6 of 6 (Final)	PIPE DOWNSTREAM



NOTES:

(1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.

(2) "t_o" is the minimum design thickness.

WELD NUMBER	FLAW CHARACTERIZATION	DESIGN DIMENSIONS			COMMENTS
		t_o	A	B	
02AS-S6	100% thru wall by 360° length	0.45"	4.5"	4.5"	NUREG-0313, Rev. 2 "Standard" Overlay Design

REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE	DESCRIPTION
0	TED 3/22/96	TKM 3/22/96	RPC 3/22/96	[signature] 3/22/96	[signature] 3/23/96	Issued for Construction.

JOB NO.: 1598-00044.010	PLANT/UNIT: Quad Cities Unit 1	VECTRA	SHT. 1 OF 1	REV. 0
FILE NO.: XCE042.0208	SKETCH NO.: 1598-00044.010-0208			

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.

VECTRA

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.

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.

9. 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-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.

VECTRA

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

VECTRA

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

Station: Quad Cities Affected Unit: 1 Changes to a previously Approved ECN [ ]	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. E04-1-96-023-C Project No. (if appl.) 1598-00044 Supp ID No. (if appl.) N/A System: 0200

Description of Design Change Request:

Weld overlay repair (WOR) of weldment 02AS-F2 on line 1-0202A-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 02AS-F2 on line 1-0202A-28" to repair intergranular stress corrosion cracking (IGSCC).

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		
Mechanical	OLOF ANDERSSON		3/26/96	NC
Structural	J. E. NEURAUTER		3/26/96	NC
Weld & Mat.	J. A. BROWN		3/26/96	NC
Others				

Prepared by: _____ Date: 3/25/96

Review by: _____ C or NC Date: 3/26/96

Approved by: _____ Date: 3/26/96

All affected design documents revised by (date): _____

Verified by: _____ Date: _____

DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST

(Part 2)

Associated With:

- ☐ ECN - Comment
- ☒ ECN - Construction
- ☐ FCR
- ☐ Other:

DCD Number: 04-01339M

Station: Quad Cities Unit: 1

Plant Design Change/Change Authority:

Type: EPC

Number: E04-1-96-023-C

Part 1 - General Information - Optional for FCR

Date Prepared: 3/25/96

A/E: V006 Project No.: 1598-00044

W.O. or Function No.: 052306-3171

Originator: Siegel, K.

Organization: VECTRA Technologies

Department: N/A

Phone No./Ext: (708) 778-4266

Description: Weld overlay repair of weldment 02AS-F2 on line 1-0202A-28" of the Reactor Recirculation System.

Part 2 - Related Design Change Documents (i.e., ECN, FCR)

Ref. No.	Type	Number	Ref. No.	Type	Number
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Control Room Drawings Affected? ____Yes __X__No

P & IDs Affected: ____Yes __X__No (optional)

Part 3 - Affected Design Documents

DESIGN DOCUMENT (DD)					C / R*	F / D **	Crit. Drwg.	Related DCDs (Ref # from Part 2)	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date					
DWG-C	C502	M-3103	3	E	R	D			

*'C' for Construction or 'R' for Record

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

Back-Up Calculation Listing
(Part 2)

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. 04-01339M
Design Change No.: E04-1-96-023-C
Page 4 of 6

Station: Quad Cities Affected Unit: 1 Page: 1 of 1

CERTIFICATION OF ECN NO. 04-01339M

I certify that this Engineering Change Notice was prepared by me or under my supervision and I am a registered Professional Engineer under the laws of the State of Illinois.

Certified by: James A Brown Date: 3/26/96

Seal

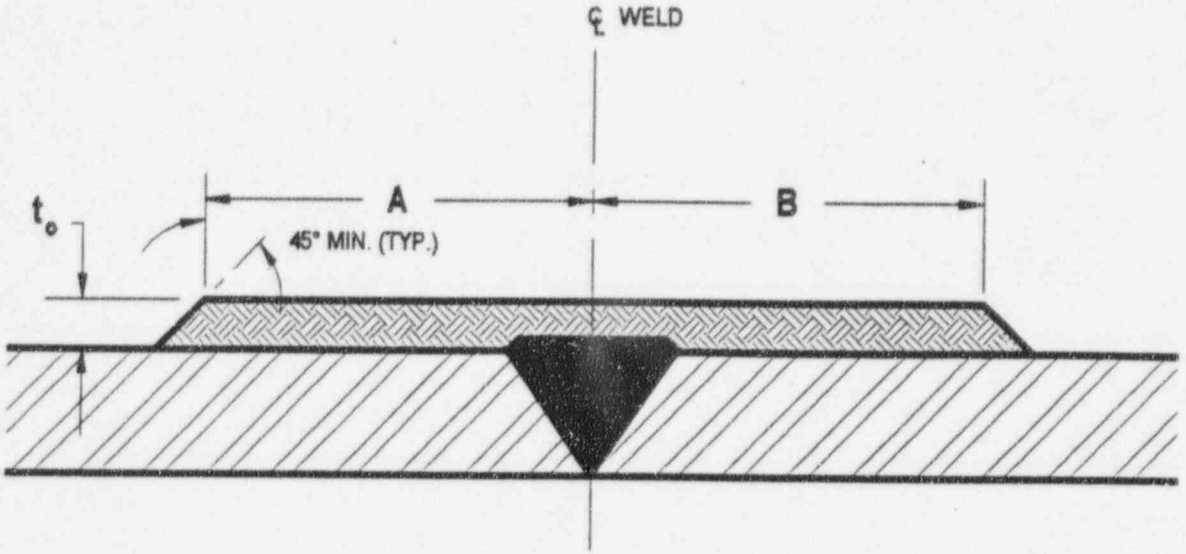
SUPPORT INFORMATION
(Part 4)

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)

SAFE END	ECN No.: 04-1339M Design Change No.: E04-1-96-023-C Page 6 of 6 (Final)	PIPE
UPSTREAM		DOWNSTREAM



NOTES:

(1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.

(2) "t_o" is the minimum design thickness.

WELD NUMBER	FLAW CHARACTERIZATION	DESIGN DIMENSIONS			COMMENTS
		t_o	A	B	
02AS-F2	100% thru wall by 360° length	0.45"	4.5"	4.5"	NUREG-0313, Rev. 2 "Standard" Overlay Design

REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE	DESCRIPTION
0	3/25/96	TKM 3/25/96	RPC 3/25/96	CRJ 3/25/96	3/26/96	Issued for Construction.

JOB NO.:	PLANT/UNIT:			REV.
1598-00044.010	Quad Cities Unit 1	VECTRA	SHT. 1 OF 1	0
FILE NO.: XCE042.0209	SKETCH NO.: 1598-00044.010-0209			

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.: 052305-3171

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-D

3. 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.

VECTRA

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.

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.

9. 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.

c. 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

VECTRA

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)

VECTRA

ISSUANCE: [X] FOR CONSTRUCTION [ ] FOR COMMENT

ECN No. 04-01340M

Station: Quad Cities Affected Unit: 1 Changes to a previously Approved ECN [ ]	[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

Description of Design Change Request:

Weld overlay repair (WOR) of weldment 02AS-S4 on line 1-0202A-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 02AS-S4 on line 1-0202A-28" to repair intergranular stress corrosion cracking (IGSCC).

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		
Mechanical	C. OF ANDERSON	[signature]	3/26/96	NC
Structural	J.E. NEURAUTER	[signature]	3/26/96	NC
Weld & Matl.	J. A. BROWN	[signature]	3/26/96	NC
Others				

Prepared by: [signature] Date: 3/26/96

Review by: [signature] C or NC Date: 3/26/96

Approved by: [signature] Date: 3/26/96

All affected design documents revised by (date): _____

Verified by: _____ Date: _____

DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST

(Part 2)

Associated With:

- ☐ ECN - Comment
- ☒ ECN - Construction
- ☐ FCR
- ☐ Other:

DCD Number: 04-01340M

Station: Quad Cities Unit: 1

Plant Design Change/Change Authority:

Type: EPC

Number: E04-1-96-023-D

Part 1 - General Information - Optional for FCR

Date Prepared: 3/25/96

A/E: V006 Project No.: 1598-00044

W.O. or Function No.: 052306-3171

Originator: Siegel, K.

Organization: VECTRA Technologies

Department: N/A

Phone No./Ext: (708) 778-4266

Description: Weld overlay repair of weldment 02AS-S4 on line 1-0202A-28" of the Reactor Recirculation System.

Part 2 - Related Design Change Documents (i.e., ECN, FCR)

Ref. No.	Type	Number	Ref. No.	Type	Number
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Control Room Drawings Affected? ___Yes _X_No

P & IDs Affected: ___Yes _X_No (optional)

Part 3 - Affected Design Documents

DESIGN DOCUMENT (DD)					C / R*	F / D **	Crit. Drwg.	Related DCDs (Ref # from Part 2)	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date					
DWG-C	C502	M-3103	3	E	R	D			

*'C' for Construction or 'R' for Record

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

Back-Up Calculation Listing
(Part 2)

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. 04-01340M
Design Change No.: E04-1-96-023-D
Page 4 of 6

Station: Quad Cities Affected Unit: 1 Page: 1 of 1

CERTIFICATION OF ECN NO. 04-01340M

I certify that this Engineering Change Notice was prepared by me or under my supervision and I am a registered Professional Engineer under the laws of the State of Illinois.

Certified by: James A Brown Date: 3/26/96

Seal

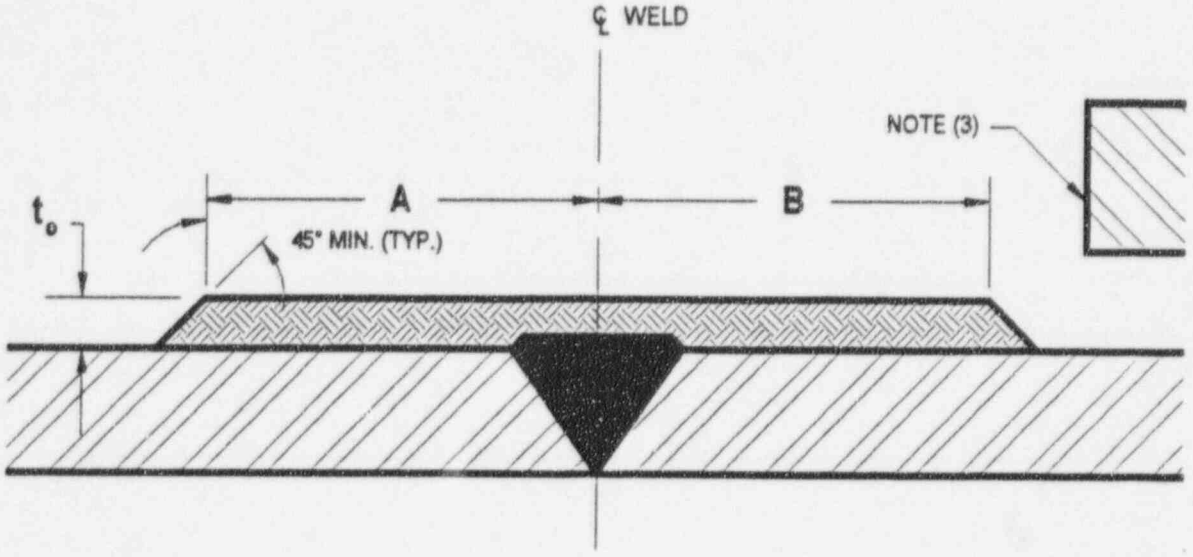
SUPPORT INFORMATION
(Part 4)

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 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)

ELBOW	ECN No.: 04-1340M Design Change No.: E04-1-96-023-D Page 6 of 6 (Final)	PIPE
UPSTREAM		DOWNSTREAM



NOTES:

(1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.

(2) "t_o" 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".

WELD NUMBER	FLAW CHARACTERIZATION	DESIGN DIMENSIONS			COMMENTS
		t_o	A	B	
02AS-S4	100% thru wall by 360° length	0.45"	4.5"	(3)	NUREG-0313, Rev. 2 "Standard" Overlay Design

REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE	DESCRIPTION
0	3/25/96	KM 3/25/96	RPC 3/25/96	CHJ 3/25/96	3/26/96	Issued for Construction.

JOB NO.:	PLANT/UNIT:			REV.
1598-00044.010	Quad Cities Unit 1	VECTRA	SHT. 1 OF 1	0
FILE NO.: XCE042.0210	SKETCH NO.: 1598-00044.010-0210			

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

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

3. 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.

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.

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.

9. 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 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.

VECTRA

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

VECTRA

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)

VECTRA

ISSUANCE: [X] FOR CONSTRUCTION [ ] FOR COMMENT

ECN No. 04-01341M

Station: Quad Cities Affected Unit: 1 Changes to a previously Approved ECN [ ]	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. E04-1-96-023-E Project No. (if appl.) 1598-00044 Supp ID No. (if appl.) N/A System: 0200

Description of Design Change Request:

Weld overlay repair (WOR) of weldment 02AD-F12 on line 1-0201A-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 02AD-F12 on line 1-0201A-28" to repair intergranular stress corrosion cracking (IGSCC).

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		
Mechanical	OLOF ANDERSSON	Olof Andersson	3/26/96	NC
Structural	J.E. NEURAUTER	J E Neurauter	3/26/96	NC
Weld & Matl.	J.A. BROWN	J.A. Brown	3/26/96	NC
Others				

Prepared by: Keith Knight Date: 3/26/96

Review by: Mike Chenlen C or NC Date: 3/26/96

Approved by: James A Brown Date: 3/26/96

All affected design documents revised by (date): _____

Verified by: _____ Date: _____

DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST
(Part 2)

Associated With:

- ☐ ECN - Comment
- ☒ ECN - Construction
- ☐ FCR
- ☐ Other:

DCD Number: 04-01341M

Station: Quad Cities Unit: 1

Plant Design Change/Change Authority:

Type: EPC

Number: E04-1-96-023-E

Part 1 - General Information - Optional for FCR

Date Prepared: 3/25/96

A/E: V006 Project No.: 1598-00044

W.O. or Function No.: 052306-3171

Originator: Siegel, K.

Organization: VECTRA Technologies

Department: N/A

Phone No./Ext: (708) 778-4266

Description: Weld overlay repair of weldment 02AD-F12 on line 1-0201A-28" of the Reactor Recirculation System.

Part 2 - Related Design Change Documents (i.e., ECN, FCR)

Ref. No.	Type	Number	Ref. No.	Type	Number
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Control Room Drawings Affected? ____Yes __X__No

P & IDs Affected: ____Yes __X__No (optional)

Part 3 - Affected Design Documents

DESIGN DOCUMENT (DD)					C / R*	F / D**	Crit. Drwg.	Related DCDs (Ref # from Part 2)	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date					
DWG-C	C502	M-3103	2	E	R	D			

*'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: Quad Cities Affected Unit: 1 Page: 1 of 1

CERTIFICATION OF ECN NO. 04-01341M

I certify that this Engineering Change Notice was prepared by me or under my supervision and I am a registered Professional Engineer under the laws of the State of Illinois.

Certified by: James A. Brown Date: 3/26/96

Seal

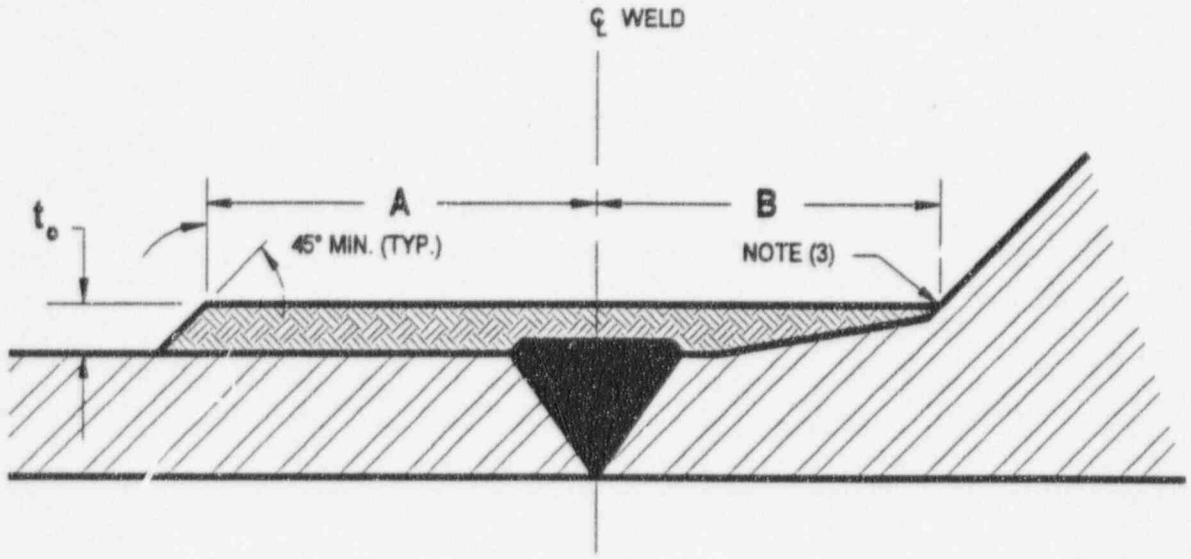
SUPPORT INFORMATION
(Part 4)

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 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)

PIPE	ECN No.: 04-1341M Design Change No.: E04-1-96-023-E Page 6 of 6 (Final)	PUMP
DOWNSTREAM		UPSTREAM



NOTES:

(1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.

(2) "t_o" 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	FLAW CHARACTERIZATION	DESIGN DIMENSIONS			COMMENTS
		t_o	A	B	
02AD-F12	100% thru wall by 360° length	0.49"	4.5"	(3)	NUREG-0313, Rev. 2 "Standard" Overlay Design

REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE	DESCRIPTION
0	[illegible] 3/25/96	TKm 3/25/96	RPC 3/25/96	[illegible] 3/25/96	[illegible] 3/26/96	Issued for Construction.

JOB NO.:	PLANT/UNIT:			REV.
1598-00044.010	Quad Cities Unit 1	VECTRA	SHT. 1 OF 1	0
FILE NO.: XCE042.0211	SKETCH NO.: 1598-00044.010-0211			

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

3. 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.

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.

9. 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

VECTRA

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)

VECTRA

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

Station: Quad Cities Affected Unit: 1 Changes to a previously Approved ECN [ ]	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. E04-1-96-023-G Project No. (if appl.) 1598-00044 Supp ID No. (if appl.) N/A System: 0200

Description of Design Change Request:

Weld overlay repair (WOR) of weldment 02AS-F14 on line 1-0202A-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 02AS-F14 on line 1-0202A-28" to repair intergranular stress corrosion cracking (IGSCC).

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		
Mechanical	D. P. DeGrush	[signature]	3/29/96	NC
Structural	J. E. Neurauter	[signature]	3/29/96	NC
Weld & Matl.	J. A. Brown	[signature]	3/29/96	NC
Others	N/A	N/A		

Prepared by: [signature] Date: 3/29/96

Review by: [signature] C or NC Date: 3/29/96

Approved by: [signature] Date: 3/29/96

All affected design documents revised by (date): _____

Verified by: _____ Date: _____

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

DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST
(Part 2)

Associated With:

☐ ECN - Comment

☒ ECN - Construction

☐ FCR

☐ Other:

DCD Number: 04-01344M

Station: Quad Cities Unit: 1

Plant Design Change/Change Authority:

Type: EPC

Number: E04-1-96-023-G

Part 1 - General Information - Optional for FCR

Date Prepared: 3/28/96

A/E: V006 Project No.: 1598-00044

W.O. or Function No.: 052306-3171

Originator: Siegel, K.

Organization: VECTRA Technologies

Department: N/A

Phone No./Ext: (708) 778-4266

Description: Weld overlay repair of weldment 02AS-F14 on line 1-0202A-28" of the Reactor Recirculation System.

Part 2 - Related Design Change Documents (i.e., ECN, FCR)

Ref. No.	Type	Number	Ref. No.	Type	Number
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Control Room Drawings Affected? ___Yes _X_No

P & IDs Affected: ___Yes _X_No (optional)

Part 3 - Affected Design Documents

DESIGN DOCUMENT (DD)					C / R*	F / D **	Crit. Drwg.	Related DCDs (Ref # from Part 2)	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date					
DWG-C	C502	M-3103	3	E	R	D			

*'C' for Construction or 'R' for Record

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

Back-Up Calculation Listing
(Part 2)

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: Quad Cities Affected Unit: 1 Page: 1 of 1

CERTIFICATION OF ECN NO. 04-01344M

I certify that this Engineering Change Notice was prepared by me or under my supervision and I am a registered Professional Engineer under the laws of the State of Illinois.

Certified by: James A Brown Date: 3/29/96

Seal

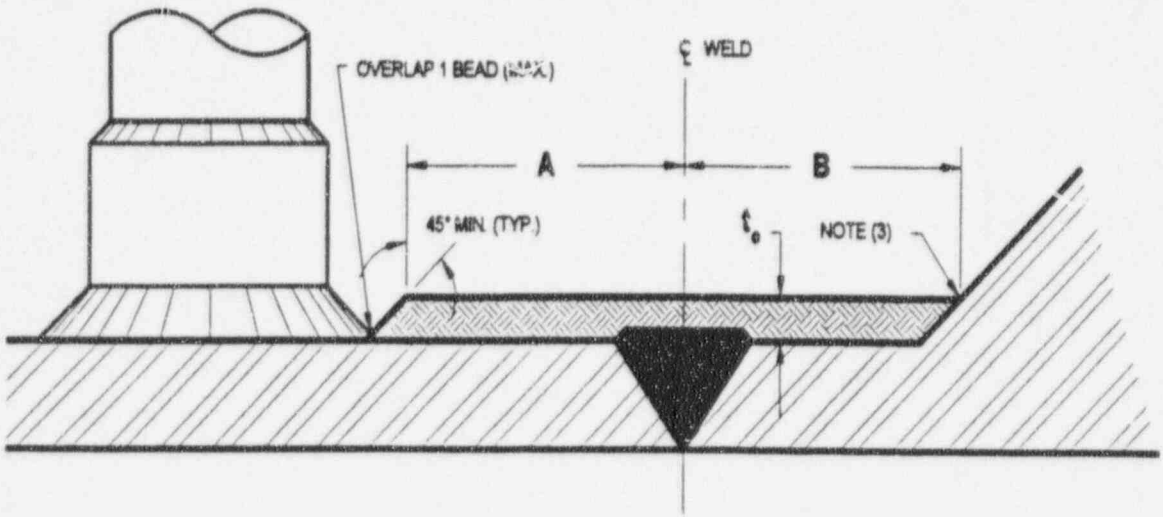
SUPPORT INFORMATION
(Part 4)

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)

PIPE	ECN No.: 04-1344M Design Change No.: E04-1-96-023-G Page 6 of 6 (Final)	ELBOW
UPSTREAM		DOWNSTREAM



NOTES:

(1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.

(2) "t_o" 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.

WELD NUMBER	FLAW CHARACTERIZATION	DESIGN DIMENSIONS			COMMENTS
		t_o	A	B	
02AS-F14	100% thru wall by 360° length	0.48"	(3)	(3)	NUREG-0313, Rev. 2 "Standard" Overlay Design

REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE	DESCRIPTION
0	3/29/96	3/29/96	3/29/96	3/29/96	3/29/96	Issued for Construction.

JOB NO.:	PLANT/UNIT:			REV.
1598-00044.010	Quad Cities Unit 1	VECTRA	SHT. 1 OF 1	0
FILE NO.: XCE042.0214	SKETCH NO.: 1598-00044.010-0214			

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

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

3. 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.

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.

9. 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

VECTRA

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

VECTRA

ENGINEERING CHANGE NOTICE
(Part 1)

ISSUANCE: [X] FOR CONSTRUCTION [ ] FOR COMMENT

ECN No. 04-01345M

Station: Quad Cities Affected Unit: 1 Changes to a previously Approved ECN [ ]	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. E04-1-96-023-F Project No. (if appl.) 1598-00044 Supp ID No. (if appl.) N/A System: 0200

Description of Design Change Request:

Weld overlay repair (WOR) of weldment 02AS-S12 on line 1-0202A-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 02AS-S12 on line 1-0202A-28" to repair intergranular stress corrosion cracking (IGSCC).

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		
Mechanical	D. P. DeGrush	[signature]	3/29/96	NC
Structural	J. E. Neurauter	[signature]	3/29/96	NC
Weld & Matl.	J. A. Brown	[signature]	3/29/96	NC
Others	N/A	N/A		

Prepared by: [signature] Date: 3/29/96

Review by: [signature], C or NC Date: 3/29/96

Approved by: [signature] Date: 3/29/96

All affected design documents revised by (date): _____

Verified by: _____ Date: _____

DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST

(Part 2)

Associated With:

- ☐ ECN - Comment
- ☒ ECN - Construction
- ☐ FCR
- ☐ Other:

DCD Number: 04-01345M

Station: Quad Cities Unit: 1

Plant Design Change/Change Authority:

Type: EPC

Number: E04-1-96-023-F

Part 1 - General Information - Optional for FCR

Date Prepared: 3/28/96

A/E: V006 Project No.: 1598-00044 W.O. or Function No.: 052306-3171

Originator: Siegel, K. Organization: VECTRA Technologies

Department: N/A Phone No./Ext: (708) 778-4266

Description: Weld overlay repair of weldment 02AS-S12 on line 1-0202A-28" of the Reactor Recirculation System.

Part 2 - Related Design Change Documents (i.e., ECN, FCR)

Ref. No.	Type	Number	Ref. No.	Type	Number
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Control Room Drawings Affected? ____Yes __X__No P & IDs Affected: (optional) ____Yes __X__No

Part 3 - Affected Design Documents

DESIGN DOCUMENT (DD)					C / R*	F / D **	Crit. Drwg.	Related DCDs (Ref # from Part 2)	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date					
DWG-C	C502	M-3103	3	E	R	D			

*'C' for Construction or 'R' for Record

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

Back-Up Calculation Listing
(Part 2)

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

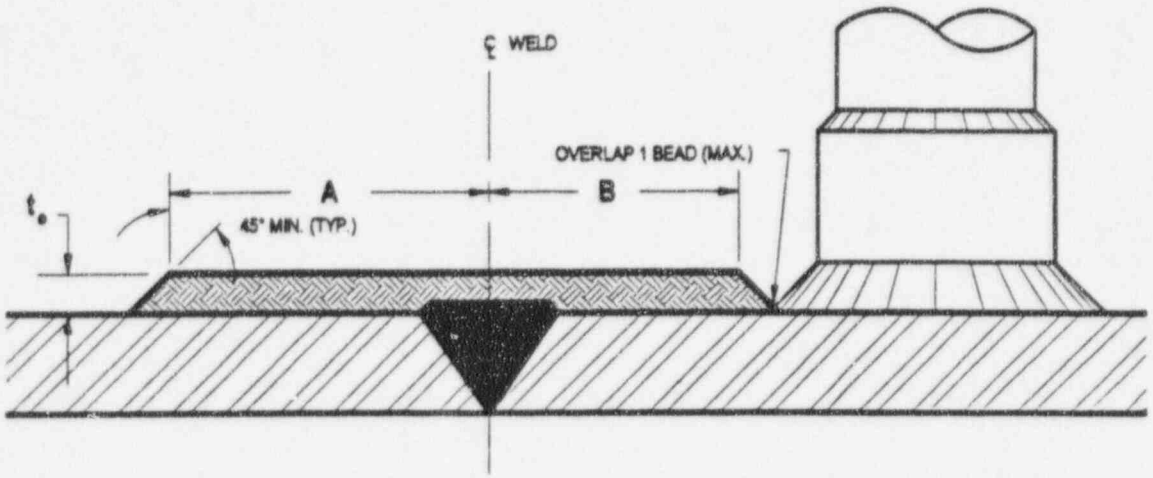
SUPPORT INFORMATION
(Part 4)

4.1 General

Note No.	Description
4.1.1	Weld overlay application shall be in accordance with page 6 of this ECN (Sketch 1598-00044.010-0213) 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 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)

ELBOW	ECN No.: 04-01345M Design Change No.: E04-1-96-023-F Page 6 of 6 (Final)	PIPE
UPSTREAM		DOWNSTREAM



NOTES:

(1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.

(2) "t_o" 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".

WELD NUMBER	FLAW CHARACTERIZATION	DESIGN DIMENSIONS			COMMENTS
		t_o	A	B	
02AS-S12	100% thru wall by 360° length	0.50"	4.5"	(3)	NUREG-0313, Rev. 2 "Standard" Overlay Design

REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE	DESCRIPTION
0	3/29/96	3/29/96	3/29/96	3/29/96	3/29/96	Issued for Construction.

JOB NO.:	PLANT/UNIT:			REV.
1598-00044.010	Quad Cities Unit 1	VECTRA	SHT. 1	0
FILE NO.: XCE042.0213	SKETCH NO.: 1598-00044.010-0213		OF 1	

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:

1. 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.

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.

9. 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.

VECTRA

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.

c. 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.
Project Manager

JAB/lab

Attachment

VECTRA

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)

VECTRA

ISSUANCE: [X] FOR CONSTRUCTION [ ] FOR COMMENT

ECN No. 04-01346M

Station: Quad Cities Affected Unit: 1 Changes to a previously Approved ECN [ ]	[X] Safety Related [ ] Non-Safety Related [ ] Regulatory	Design Change No. E04-1-96-023-H Project No. (if appl.) 1598-00044 Supp ID No. (if appl.) N/A System: 0200

Description of Design Change Request:

Weld overlay repair (WOR) of weldment 02BS-F14 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-F14 on line 1-0202B-28" to repair intergranular stress corrosion cracking (IGSCC).

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		
Mechanical	DAVID DEGRUSH	[signature]	4/2/96	NC
Structural	CHARLES E. PROKUSH	[signature]	4/2/96	NC
Weld & Matl.	J. A. BROWN	[signature]	4/2/96	NC
Others	N/A	N/A		

Prepared by: [signature] Date: 4/2/96

Review by: [signature] C or NC Date: 4/2/96

Approved by: [signature] Date: 4/2/96

All affected design documents revised by (date): _____

Verified by: _____ Date: _____

DESIGN CHANGE DOCUMENT - AFFECTED DOCUMENT LIST

(Part 2)

Associated With:

- ☐ ECN - Comment
- ☒ ECN - Construction
- ☐ FCR
- ☐ Other:

DCD Number: 04-01346M

Station: Quad Cities Unit: 1

Plant Design Change/Change Authority:

Type: EPC

Number: E04-1-96-023-H

Part 1 - General Information - Optional for FCR

Date Prepared: 4/02/96

A/E: V006 Project No.: 1598-00044 W.O. or Function No.: 052306-3171

Originator: Siegel, K. Organization: VECTRA Technologies

Department: N/A Phone No./Ext: (708) 778-4266

Description: Weld overlay repair of weldment 02BS-F14 on line 1-0202B-28" of the Reactor Recirculation System.

Part 2 - Related Design Change Documents (i.e., ECN, FCR)

Ref. No.	Type	Number	Ref. No.	Type	Number
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Control Room Drawings Affected? ___Yes _X_No P & IDs Affected: ___Yes _X_No (optional)

Part 3 - Affected Design Documents

DESIGN DOCUMENT (DD)					C / R*	F / D **	Crit. Drwg.	Related DCDs (Ref # from Part 2)	Incorp. Rev. or Date Optional
Type Code	Vndr Code	Number	Sheet/ Page	Mark Up Rev Date					
DWG-C	C502	M-3103	3	E	R	D			

*'C' for Construction or 'R' for Record **'F' for Functional or 'D' for Detailed

Back-Up Calculation Listing
(Part 2)

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. 04-01346M
Design Change No.: E04-1-96-023-H
Page 4 of 6

Station: Quad Cities Affected Unit: 1 Page: 1 of 1

CERTIFICATION OF ECN NO. 04-01346M

I certify that this Engineering Change Notice was prepared by me or under my supervision and I am a registered Professional Engineer under the laws of the State of Illinois.

Certified by: James A Brown Date: 4/2/96

Seal

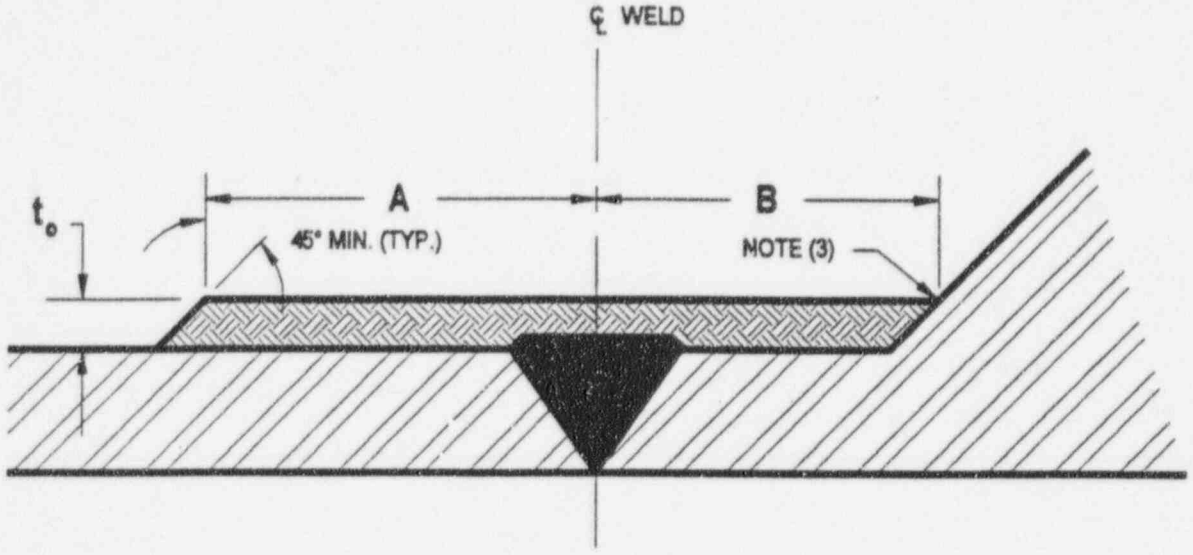
SUPPORT INFORMATION
(Part 4)

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 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)

PIPE	ECN No.: 04-1346M Design Change No.: E04-1-96-023-H Page 6 of 6 (Final)	ELBOW
UPSTREAM		DOWNSTREAM



NOTES:

(1) This repair shall comply with the technical requirements contained in Document No. COE-107-500, latest revision.

(2) "t_o" 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.

WELD NUMBER	FLAW CHARACTERIZATION	DESIGN DIMENSIONS			COMMENTS
		t_o	A	B	
02BS-F14	100% thru wall by 360° length	0.43"	4.5"	(3)	NUREG-0313, Rev. 2 "Standard" Overlay Design

REV.	PREP. BY/ DATE	CHK. BY/ DATE	P.E. APPR./ DATE	E.M. APPR./ DATE	P.M. APPR./ DATE	DESCRIPTION
0	JRD 4/1/96	TKM 4/1/96	RPC 4/1/96	CHJ 4/1/96	4/2/96	Issued for Construction.

JOB NO.:	PLANT/UNIT:			REV.
1598-00044.010	Quad Cities Unit 1	VECTRA	SHT. 1 OF 1	0
FILE NO.: XCE042.0212	SKETCH NO.: 1598-00044.010-0212			

Attachment 2