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1400 Opus Place  
Downers Grove, Illinois 60515

September 4, 1990

Dr. Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation  
Washington, D.C. 20555

ATTN: Document Control Desk

Subject: Dresden Nuclear Power Station Unit 3  
Summary of Fabrication History for  
the Upper Reactor Vessel  
NRC Docket No. 50-249

- References:
- (a) NRC/CECo Meeting at NRR office  
(Rockville, Maryland) on April 19, 1990.
  - (b) R. Stols letter to T. Murley, dated  
May 4, 1990.
  - (c) R. Stols letter to T. Murley, dated  
July 2, 1990.

Dr. Murley:

A meeting was held with your staff on April 19, 1990 (Reference (a)) to discuss the cracks identified in the Quad Cities Unit 2 reactor vessel head. During that meeting, Commonwealth Edison Company (CECo) committed to research the fabrication history of its Boiling Water Reactor (BWR) vessels. Reference (b) provided a schedule for the submittal of a summary on the fabrication history for each CECo BWR vessel. In accordance with that schedule, this letter transmits the upper vessel fabrication history summary for Dresden Unit 3.

This summary was developed through the review of the General Electric Quality Control Checklist for the Dresden Unit 3 reactor vessel, which referenced contract variations and variation notices. Attachment 'A' provides a listing of the contract variations and variation notices for the Unit 3 reactor vessel. All of these contract variations and variation notices were reviewed. As indicated in Reference (c), CECo has found this approach to be the most efficient in determining which areas are to be inspected. A graphic summary of the Unit 3 vessel fabrication is presented in Figure 1.

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The Dresden Unit 3 reactor vessel was fabricated entirely by Babcock and Wilcox. The documentation review identified a number of fabrication variations which addressed base metal repairs, dimensional variations, lack of control of formed sections, mismatches at butt welds, and process control violations. These variations had been reviewed and dispositioned by General Electric. The major fabrication mismatches for the upper portions of the Unit 3 reactor vessel, which are considered to be significant for development of an inspection plan, were at the upper head dollar plate-to-torus, upper head torus-to-flange, and uppermost shell-to-shell welds (shown on Figure 1). The documentation indicates that the upper head dollar plate-to-torus weld was backclad by submerged arc welding along with the entire dollar plate-torus assembly. Backcladding of the upper head torus-to-flange and uppermost shell-to-shell welds was performed by manual shielded metal arc welding. Based on this fabrication history review, CECO will be developing an inspection plan for Unit 3 for submittal to the NRC by December 3, 1990 (as indicated in Reference (b)).

Please direct any questions or comments on this letter to this office.

Respectfully,

*Milton H. Richter*

M.H. Richter  
Nuclear Licensing Administrator

Attachment A - Contract Variations and Variation Notices  
for the Dresden Unit 3 Reactor Vessel

Figure 1 - Summary of Dresden Unit 3 Reactor Vessel Fabrication

cc: A.B. Davis, Regional Administrator (RIII)  
B.L. Siegel, Project Manager (NRR)  
B. Elliot, Technical Staff (NRR)  
S. DuPont, Senior Resident Inspector (Dresden)

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## ATTACHMENT A

Contract Variations and Variation Notices for the  
Dresden Unit 3 Reactor VesselLIST OF DEVIATION REPORTS

## DRESDEN III

CV No.	Part	Subject	Sheet No.	GE Approved Disposition
VN-16134	MK 2 Bottom Head Upper Torus Plate SN 2-111-2 Heat A0237-2	Laminar type defects	M-3.2	Weld repair. GE document status stamp 5-12-66.
VN-16093	Plate Heat A0284-1	Magnaflux cavity	N-A	Disapproved. Plate not applied to vessel. GE document status stamp 5-10-66.
VN-111-1	Mk 209 Closure Head Flange Heat 5P1127	UT indication, bands of material	M-1.3	Accepted as is after additional drop test. GE Inspection Report R-E0058 11-29-66.
VN-111-2	Mk 1 Bottom Head Dome Portion	Clad of dome did not meet density requirement	FH-3.0	Original clad rejected. Weld repair approved. GE disposition stamp 2-1-67.
VN-111-3				
VN-111-4	Mk 60 Upper Shell	UT indications	FH-2.1	Remove the indications and weld repair. GE Disposition Stamp 2-8-67
VN-111-5	MK 59 Upper Intermediate Shell	Undersize inside diameter	FS-2.2	Split the shell and make an additional long seam. GE Disposition Stamp 3-20-67
VN 111-5A				
VN-111-6	MK 60 Upper Shell	Undersize inside diameter	FS-2.1	Split the shell and make an addi- tional long seam. GE Disposition Stamp 4-26-67.
VN-111-6B				

## ATTACHMENT A (cont'd)

List of Deviation Reports--Dresden III

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CV No.	Part	Subject	Sheet No.	GE Approved Disposition
VN-111-7	MK A-1 Bottom Head Dome	Change in the method of fabrication requires the removal of the SS cladding	FH-3.0	Remove the SS cladding and deposit the Inconel layer of cladding. GE Disposition Stamp 4-3-68.
VN-111-8 VN-111-10	MK 59 Upper Intermediate Shell Course	Variation in cladding chemistry	FS-2.2	Remove nine beads and weld repair. GE Disposition Stamp 8-30-67.
VN-111-9	MK 59 Upper Intermediate Shell	UT indications in the base metal	FS-2.2	Remove the indications and weld repair. GE Disposition Stamp 7-14-67.
VN-111-11	MK 7 Recirc. Inlet Nozzle	Incorrect taper location	FN-4.2	Approved as is. GE Disposition Stamp 11-9-67.
CV-111-12	MK 10 Feedwater Nozzle	Bore diameter out of tolerance	M-4.4	Approved as is. Thermal sleeve to be custom machined. GE Disposition Stamp 11-28-67.
CV-111-13	MK 10 Feedwater Nozzle to Safe End Weld	Radiographic indication	FN-4.4	Remove the indication and weld repair. GE Disposition Stamp 1-29-68.
CV-111-14	Top Head MK 201 - Dome MK 202 - Torus	Mismatch between the dome and	FH-1.0	Accept as is. Sufficient weld metal to be deposited in the mismatch area at the time the circumferential seam is welded to permit a smooth blend of the offset. GE Disposition Stamp 4-11-68.

## Attachment A (cont'd)

List of Deviation Reports--Dresden III

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CV No.	Part	Subject	Sheet No.	GE Approved Disposition
CV-111-15	MK 48 Vessel Flange	MP indications on the outside surface of the flange	FA-2.1	Remove the indications and weld repair. GE Disposition Stamp 7-5-68.
CV-111-16	MK 61 Closure Stud S/N 61-111-61	Dimensional discrepancy	M-6.1	Accept as is. GE Disposition Stamp 3-9-68.
CV-111-17	MK 54 Shroud Support	MK 53 shroud not located on the centerline of the MK 54 baffle	FA-5.1	Accept as is. EDS 12-18-68.
CV-111-17A				
CV-111-18	Bottom Head MK 1 - Dome MK 4 - Center Torus	Mismatch between dome and torus	FH-3.0	Mismatch accepted. Sufficient weld metal shall be deposited on the low side of the seam to permit blending to a 3:1 taper. GE Disposition Stamp 6-20-68.
CV-111-19	Closure Head MK 209 - Flange MK 202 - Torus	Mismatch of head flange to closure assembly	FH-1.0	Mismatch accepted. Sufficient weld metal shall be deposited to blend the torus to closure. EDS 7-1-69
CV-111-19A				
CV-111-19B				
CV-111-20	MK 62 Castellated Nut	Nut S/N 62-111-36 thread with discrepant pith diameter	M-6.2	CV was not approved and withdrawn. The nut S/N 62-111-36 was discarded EDS 12-18-68.
CV-111-21	MK 14 to MK 60 Weld Seam	Cavity in the seam	FS-2.1	Weld repair. EDS 6-4-69
CV-111-22	MK 61 Closure Stud S/N 61-111-20	Dimensional error	M-6.1	Accept as is. EDS 12-10-69

## List of Deviation Reports--Dresden III

CV No.	Part	Subject	Sheet No.	GE Approved Disposition
CV-111-23	MK-D1 Lower Head Assembly	Flux monitor holes machined too deep	FH-3.0	Dimensions restored by buttering. EDS 6-4-69.
CV-111-24	MK 48 Vessel Flange	Dimensional error in packing slot	FA-2.1	Weld repair. EDS-24 dated 8-1-69. EDS-25 dated 3-25-69.
CV-111-25				
CV-111-26	MK 206 6-Inch Instrument Nozzle	Dimensional variation	FN-4.6	Accepted as is. EDS 4-9-69.
CV-111-27	MK 11 10-Inch Core Spray Nozzle	Dimensional variation	FN-4.5	Closed per changed drawing. EDS's 4-25-69 and 7-31-69.
CV-111-28	MK 48 Flange MK 60 Upper Shell	Dimensional variation in the flange-to-shell area	FS-2.1	Weld repair. EDS 7-15-69.
CV-111-29	MK 60 Upper Shell MK 59 Upper Intermediate Shell	Mismatch between MK 60 and MK 59	FS-2.1	Weld procedure to provide the specified taper. EDS 10-9-69
CV-111-30	MK 57 Lower Shell MK 2 Bottom Head	Mismatch between MK 57 and MK 2	FH 3.0	Weld procedure to provide the specified taper. EDS 10-22-69.
CV-111-30A				
CV-111-31	MK 40 Support Skirt	Oversized access opening	FH-3.3	Accepted as is. EDS 9-12-69.
CV-111-32	MK E-1 Lower Vessel Assembly	Depressions on CRD nozzles and FM bores resulted from grinding of PT indications.	FH-3.0	Blended smoothly and accepted as is EDS 10-7-69.

## List of Deviation Reports--Dresden III

CV No.	Part	Subject	Sheet No.	GE Approved Disposition
CV-111-33	MK 134 Steam Dryer Guide Brackets	Machined to discrepant dimensions	FA-5.3	Accepted as is. EDS 10-14-69.
CV-111-34	MK E-1 Stub Tube Hole No. 9	Cavity in the base metal resulted from grinding of PT indication	FH-3.0	Blended to 3:1 taper. Accepted as is. EDS 10-7-69.
CV-111-35	MK F-1 Lower Vessel Assembly MK 7 Recirculation Inlet Nozzle	Dimensional discrepancies in the recirculation inlet nozzle S/N 7-111-9	M-4.2	Weld build up. Remachined. EDS 10-23-69.
CV-111-36	MK D-48 Upper Vessel Assembly	Variations in the azimuth location of the following nozzles: MK 10 - Feedwater Nozzle MK 11 - Core Spray Nozzle MK 12 - Instrument Nozzle MK 13 - CRD Hydr. Return Nozzle MK 14 - Steam Outlet Nozzle	FS-2.2 FS-2.1	Approved as is. EDS 10-7-69.
CV-111-37	MK F-1 Lower Vessel Assembly	Tool gouge on the bottom face of the support skirt flange MK 41	FH-3.3	Tool gouge smooth blended by grinding. Accepted as is. EDS 10-7-69.
CV-111-38	MK F-1 Lower Vessel Assembly	Dimensional discrepancies of the drain nozzle, MK 22	FN-4.14	Accepted as is. EDS 10-7-69.
CV-111-39	MK 48 Vessel Flange	Oversized bore of the stud holes. Oversized pitch diameter of the stud hole threads.	FS-2.1	Accepted as is. EDS 11-4-69.
CV-111-40	MK F-1 Lower Vessel Assembly	Dimensional discrepancy of the shroud support ring, MK 54	FH-3.0	Accepted as is. EDS 10-23-69.

## List of Deviation Reports--Dresden III

CV No.	Part	Subject	Sheet No.	GE Approved Disposition
CV-111-41	MK E-1 Lower Vessel Assembly	Cavities around the CRD penetrations resulted from grinding of UT indications	FH-3.0	Weld repair. EDS 11-26-69.
CV-111-42	MK E-1 Lower Vessel Assembly	Flux monitoring penetration, F-10, out of verticality and having tool impression	FH-3.0	Sharp edges blend ground. Accepted as is. EDS 11-5-69.
CV-111-43	MK F-1 Vessel Assembly	Discrepant length of the recirc. inlet nozzle, MK 7, S/N F-1-111-1	FS-2.3	Accepted as is. EDS 11-24-69.
CV-111-44	MK B-70	Dimensional discrepancy of the basin seal skirt, MK 70	FA-5.9	Accepted as is. EDS 11-24-69.
CV-111-45	MK F-1 Vessel Assembly	Dimensional discrepancies of steam dryer guide brackets, MK 133	FA-5.3	Accepted as is. EDS 12-9-69.
CV-111-46	MK F-1 Vessel Assembly	Mismatch between lower intermediate shell, MK 58, and lower shell, MK 57	FS-2.3	Weld repair. EDS 12-31-69.
CV-111-47	MK F-1 Vessel Assembly	Dimensional discrepancies of the bottom head insulation support plates MK 77, 78 and the skirt MK 79	Final Check Sheet	Accepted as is. B&W responsible for any modifications required at the site. EDS 12-19-69.
CV-111-48	MK F-1 Vessel Assembly	Variation in the free path dimension and the squareness of the clad face	Final Check Sheet	Accepted as is. B&W to accept back charges for any additional work in installing the jet pumps caused by the variations. EDS 12-22-69.



CV No.	Part	Subject	Sheet No.	GE Approved Disposition
CV-111-49	MK F-1 Final Assembly	Discrepant dimensions in the bore of the MK 134 steam dryer guide bracket on the "W" axis	Final Check Sheet	Approved as is. EDS 12-22-69.
CV-111-50	MK D-201 Closure Head	The I.D. of the inside "O" ring groove is deviated from drawing dimensions	FH-1.1	Approved as is. EDS 12-22-69.
CV-111-51	MK D-201 Closure Head	Slight variations in the verticality of the stud holes. Variation in the location of stud holes #91 and #92	FH-1.1	Approved as is. EDS 12-22-69.
CV-111-52	MK G-1 Final Assembly	Variations in jet pump holes.	Final Check Sheet	Variations accepted as is. EDS 12-31-69.
CV-111-53	MK G-1 Final Assembly	Variations in the flux monitor penetrations	Final Check Sheet	Approved as is. EDS 1-6-70.
CV-111-53A				
CV-111-54	MK G-1 Final Assembly	Dimensional variations in the core spray brackets, MK 132	Final Check Sheet	Approved as is. EDS 12-13-69.
CV-111-55	MK G-1 Final Assembly	Variation in the verticality of sixteen CRD nozzles	Final Check Sheet	Approved as is. EDS 1-6-70.

# FIGURE 1 - SUMMARY OF DRESDEN UNIT 3 REACTOR VESSEL FABRICATION

