

Weekly Status Report
Assessment of Embedment Plates
Status as of May 21, 1987

Commonwealth Edison Company
Dresden Station - Units 2 and 3
Quad Cities Station - Units 1 and 2

May 21, 1987.

8706080211 870522
PDR. ADDCK-05000237
R PDR

I. Introduction

This is the tenth of a series of reports which address the effort to resolve the issue regarding the embedment plates which were constructed with strap anchor spacing other than those used in the design. The purpose of this report is to update the Nuclear Regulatory Commission, Region III regarding the status for this effort. This tenth report consists of a summary of work performed during last week.

II. Dresden Station

Per the Milestone Bar Chart (Attachment 1), a walkdown at Dresden is continuing. Except for following up on a small number of hangers, the walkdown is essentially complete. We expect to complete the field walkdown activity by the end of this month.

The current cumulative walkdown status is indicated in Attachment 4A. Attachment 5A shows the cumulative status of ultrasonic testing data and resulting embedment plate assessment.

Due to high radiation in certain areas of the plant, 27 hangers are presently inaccessible. Walkdowns for these hangers will be performed when conditions permit.

III. Quad Cities Station

Per the Milestone Bar Chart (Attachment 1), the walkdown at Quad Cities is continuing. Except for following up on a small number of hangers, the walkdown is essentially complete. We expect to complete the field walkdown activity by the end of this month.

The current cumulative walkdown status is indicated in Attachment 4B. Attachment 5B shows the cumulative status of ultrasonic testing data and resulting embedment plate assessemnt.

Due to high radiation in areas of the plant, 20 hangers are presently inaccessible. Walkdowns for these hangers will be performed when conditions permit.

IV. Attachments

The following attachments are included in this weekly report.

1. Milestone Bar Chart - Dresden and Quad Cities
2. Summary of Status -

2A Dresden
2B Quad Cities

3. Number of Embedment Plates

3A Dresden
3B Quad Cities

4. Phase i - Walkdown and Evaluation Status Summary

4A Dresden
4B Quad Cities

5. Phase ii - Walkdown and Evaluation Status Summary

5A Dresden
5B Quad Cities

6. Appendix A - 24 inch Anchor Spacing

Note: Attachments 1, 2A, 2B, 3A, 3B and Appendix A have not changed. Attachments 4A, 4B, 5A and 5B have been revised to show current cumulative status.

Dresden 263 Bar Chart for Embedment Plate Issue Resolution

Quad Cities 162 Bar Chart for Embedment Plate Issue Resolution

DRESDEN
QUAD CITIES

ACTIVITY	WEEK BEGINNING MONDAY											
	2/9/87	2/16/87	2/23/87	3/2/87	3/9/87	3/16/87	3/23/87	3/30/87	4/6/87	4/13/87	4/20/87	4/27/87
- CECO requests S&L's assistance for one failed emb. plate at Dresden Unit 2 (2/11/87)	■											
- S&L assesses failed plate and informs CECO that the strap spacing on emb. plate shop dwg. is different from S&L's design dwg.		■										
- CECO requests a review of additional shop dwgs., a mockup plate ECN for UT calibration and determination of plate capacity per shop dwg. detail. Repair of failed plate is issued.		■										
- S&L obtains prints of large bore hanger dwgs. with attachment to emb. plate.		■	■									
- S&L prepares hanger location dwgs.		■	■	■								
- S&L sorts and plots hanger attachments (drafting). In addition, S&L locates seams of emb. plates using piece marks on shop dwgs.		■	■	■								
- S&L generates emb. plate capacity.		■	■	■								
- S&L performs an engineering assessment and identifies those hangers which meet the shop dwg. plate capacity and hence are of no concern.		■	■	■								
- S&L performs a sort of remaining hangers into those which may potentially affect piping system function and those for which the embedment plate FSAR allowables are exceeded.		■	■	■	■							

Dresden 263 Bar Chart for Embedment Plate Issue Resolution

Quad Cities 162 Bar Chart for Embedment Plate Issue Resolution

DRESDEN QUAD-CITIES

ACTIVITY	WEEK BEGINNING MONDAY											
	2/9/87	2/16/87	2/23/87	3/2/87	3/9/87	3/16/87	3/23/87	3/30/87	4/6/87	4/13/87	4/20/87	4/27/87
<p>S&L/CECo performs a walkdown for those hangers which may potentially affect piping system analysis and determine attachment location relative to edges of emb. plate and strap. If necessary, CECO performs UT for strap location.</p> <ul style="list-style-type: none"> - S&L utilizes walkdown data to perform a sort of these hangers to identify those hangers which still may potentially affect piping system analysis. - S&L/CECo perform a walkdown for those hangers which may potentially cause embedment plate FSAR allowables to be exceeded. - Assess these hangers based on walkdown data and issue repairs as necessary. 					<p><input type="checkbox"/> → CONTINUING</p>			<p><input type="checkbox"/> → CONTINUING</p>				

Attachment 2A

Table Summary

Drawings

Description	APPROXIMATE NUMBER OF LARGE BORE PIPE HANGERS OR EMBEDMENT PLATES								
	Total	In Unit #2	In Unit #3	Safety Related	Nonsafety Related	Reactor Bldg.	Turbine Bldg.	Loads > Upper Limit	Loads > EBAR
Large bore hangers collected for follow-up work	2230	1000	1170	750	1480	1260	720	-	-
Result of first sort using generic 2 1/2" x 2 1/2" attachment size allowable limits (number of hangers requiring follow-up work)	440	240	210	120	320	320	60	250	190
Results of second sort using generic larger attachment size allowable limits where applicable (number of hangers requiring follow-up work)	428	260	168	129	299	314	114	231*	197**
Result of walkdown and evaluation for hangers with loads > allowable upper limits (number of hangers requiring follow-up work)									
- Phase i - Visual data obtained from floor									
- Phase ii - Utilizing UT data for strap location									
Result of walkdown and evaluation for hangers with load > allowable EBAR limits (number of hangers requiring follow-up work)									
- Phase i - Visual data obtained from floor									
- Phase ii - Utilizing UT data for strap location									

The table above describes the results of large bore hanger drawing collection, plotting and sorting. Numerical values represent number of hangers and are approximate numbers.

* 87 Safety-related, 144 Nonsafety-related

** 42 Safety-related, 155 Nonsafety-related

Attachment 2B

Status Summary

Quad Cities

DESCRIPTION	APPROXIMATE NUMBER OF LARGE BORE PIPE HANGERS ON EMBEDMENT PLATES								
	Total	In Unit #1	In Unit #2	Safety Related	Nonsafety Related	Reactor Bldg.	Turbine Bldg.	Loads Upper Limit	Loads FSAR
Large bore hangers collected for follow-up work (Excludes 60 hangers on different strap plate)	2000	1000	1000	400	1600	1380	620	-	-
Result of first sort using generic 2½" x 2½" attachment size allowable limits (number of hangers requiring follow-up work)	-	-	-	-	-	-	-	-	-
Results of second sort using generic larger attachment size allowable limits where applicable (number of hangers requiring follow-up work)	146	71	75	72	74	109	37	93*	53**
Result of walkdown and evaluation for hangers with loads > allowable upper limits (number of hangers requiring follow-up work)									
- Phase i - Visual data obtained from floor									
- Phase ii - Utilizing UT data for strap location									
Result of walkdown and evaluation for hangers with load > allowable FSAR limits (number of hangers requiring follow-up work)									
- Phase i - Visual data obtained from floor									
- Phase ii - Utilizing UT data for strap location									

The table above describes the results of large bore hanger drawing collection, plotting and sorting. Numerical values represent number of hangers and are approximate numbers.

* 39 Safety-related, 54 Nonsafety-related

** 33 Safety-related, 20 Nonsafety-related

Attachment #3A
Number of Embedded Plates
Dresden

The following table shows a breakdown of number of embedded plates with large bore pipe hangers attached to them. The numbers indicated are approximate.

Bldg - Unit	Unit #2	Unit #3	Total
Reactor Building	360	470	830
Turbine Building	90	100	190
Total	450	570	1020

Attachment #3B
Number of Embedded Plates
Quad Cities

The following table shows a breakdown of number of embedded plates with large bore pipe hangers attached to them. The numbers indicated are approximate.

Bldg - Unit	Unit #1	Unit #2	Total
Reactor Building	400	400	800
Turbine Building	180	190	370
Total	580	590	1,170

ATTACHMENT 2A

Figure 1 Walkdown and Evaluation Data Summary - Dresden

Note: Evaluate & Compare loads with upper limit and EMB allowable for the specific attachment location to determine whether these limits are satisfied.

Cumulative Evaluation Date	APPROXIMATE NUMBER OF UPPER LIMIT HANGERS (A)							APPROXIMATE NUMBER OF EMB HANGERS				
	Walked Down (1)	Evaluated (2)	SUBSET OF EVALUATED HANGERS				Walked Down (8)	Evaluated (9)	Subset of Evaluated Hangers			Being Evaluated (12) = (8) - (9)
			Upper Limit (3)	EAB (Correct of 2) (4)	BT Required Exchange Down Bot. Soligty EMB				EAB (10)	BT Required Exchange Down Bot. Soligty EMB (11) (9) - (10)		
					(5) - (2)	(6) - (3)						
3/12/87	23	13	12	7	0	11	25	20	3	3	0	27
3/26/87	71	67	26	68	20	20	2	64	50	33	13	14
4/2/87	107	99	61	50	28	20	2	87	81	57	24	6
4/9/87	122	107	69	53	38	54	15	91	80	47	33	11
4/16/87	138	126	76	56	50	61	17	105	93	56	37	12
4/23/87	148	131	85	62	56	70	7	126	108	64	44	18
4/30/87	156	149	91	66	58	83	7	132	124	77	47	8
5/13/87	178	167	102	74	65	91	12	147	144	88	56	3
5/21/87	180	128	107	74	71	104	2	154	154	88	66	1

Summary as of 5/21/87

Item	Approximate Number of Hangers
Walked Down (Column (1) + Column (8))	334
Presently inaccessible (Section 11)	27
Physically removed (See Note 1)	66
Remain to be walked down	4
Total of above lines = total in walkdown scope (Attachment 2a)	428

Note 1: Included hangers physically removed by design intent or redesign and renumbered counted as distinct hangers (completing document review is in progress)

ATTACHMENT 23

Phase I Walkdown and Evaluation Status Summary - Quad C/Cler

Note: Evaluate + Compare loads with upper limit and EAR allowable for the specific attachment location to determine whether these limits are satisfied.

Cumulative Status of	APPROXIMATE NUMBER OF UPPER LIMIT HANGERS (UL)							APPROXIMATE NUMBER OF EAR HANGERS					
	Walked Down (1)	Evaluated (2)	SORT OF EVALUATED HANGERS				Being Evaluated (7) (1) (2)	Walked Down (8)	Evaluated (9)	Sort of Evaluated Hangers			Being Evaluated (12) (2) (9)
			Satisfies Upper Limit (3)	Satisfies EAR (Subs 1 or 3) (4)	BT Required Because Does Not Satisfy					Satisfies EAR (10) (9) (10)			
					III- (5) (2) (3) (Subst of (6))	EAR (6) (2) (4)					BT Required Because Does Not Satisfy EAR (11) (9) (10)		
4/2/87	20	0	0	0	0	0	20	16	0	0	0	16	
4/9/87	33	18	3	3	15	15	15	20	11	9	2	9	
4/16/87	41	36	15	12	21	24	5	27	24	14	0	4	
4/23/87	42	42	20	16	22	22	4	27	23	18	0	4	
4/30/87	56	53	22	16	31	37	3	37	25	19	6	12	
5/13/87	61	59	23	16	36	43	2	37	32	23	9	5	
5/21/87	63	62	24	16	38	46	1	39	37	23	14	2	

Summary as of 5/21/87

Item	Approximate Number of Hangers
Walked down (Column (1) + Column (8))	102
Presently inaccessible (Section III)	20
Physically removed (See Note 1)	16
Remain to be walked down	8
Total of above lines = total in walkdown scope (Attachment 23)	146

Note 1: Includes hangers physically removed by design intent or redrawn and renumbered counted as distinct hangers (confirmatory document review in progress)

Attachment 5A

Phase ii Walkdown and Evaluation Status Summary - Dresden

This table represents the status of those hangers for which U.T. data was requested. These hangers fall into the categories shown below.

Cumulative Status As Of	APPROXIMATE NUMBER OF UPPER LIMIT HANGERS (UL)								APPROXIMATE NUMBER OF FSAR HANGERS					
	U.T. Requested (Column 5 of Attachment 4A)	U.T. Received	Evaluated	Sort of Evaluated Hangers				Being Evaluated	U.T. Requested (Columns 5 + 6 of Attachment 4A)	U.T. Received	Evaluated	Sort of Evaluated Hangers		Being Evaluated
				Upper Limit UL		FSAR Limit						Satisfies FSAR	Does Not Satisfy FSAR	
				Satisfies UL	Does Not Satisfy UL	Satisfies FSAR	Does Not Satisfy FSAR							
①	②	③	④	⑤ - ③ - ④	⑥	⑦ - ③ - ⑥	⑧ = ② - ③	⑨	⑩	⑪	⑫	⑬ = ⑪ - ⑫	⑭ = ⑩ - ⑪	
4/9/87	38	34	7	7	0	7	0	27	49	23	10	10	0	13
4/16/87	51	38	15	15	1	15	1	25	57	26	12	12	0	15
4/23/87	56	47	20	20	0	20	0	33	62	33	15	15	0	20
4/30/87	58	50	31	31	0	29	2	19	72	51	28	28	0	23
5/8/87	65	53	41	41	0	38	3	12	84	61	37	37	0	24
5/21/87	71	64	47	47	0	47	0	24	98	81	47	43	0	28

*Embedment plate modifications were issued on 4/11/87, 4/17/87 and 5/4/87.

Attachment 5B

Phase ii Walkdown and Evaluation Status Summary - Quad Cities

This table represents the status of those hangers for which U.T. data was requested. These hangers fall into the categories shown below.

Cumulative Status As Of	APPROXIMATE NUMBER OF UPPER LIMIT HANGERS (UL)								APPROXIMATE NUMBER OF FSAR HANGERS					
	U.T. Requested Column (5) of Attachment 4B	U.T. Received	Evaluated	Sort of Evaluated Hangers				Being Evaluated	U.T. Requested Columns (11) + (6) (5) of Attachment 4B	U.T. Received	Evaluated	Sort of Evaluated Hangers		Being Evaluated
				Upper Limit UL		FSAR Limit						Satisfies FSAR	Does Not Satisfy FSAR	
				Satisfies UL	Does Not Satisfy UL	Satisfies FSAR	Does Not Satisfy FSAR							
	(1)	(2)	(3)	(4)	(5) - (3) - (4)	(6)	(7) - (3) - (6)	(8) - (2) - (3)	(9)	(10)	(11)	(12)	(13) - (11) - (12)	(14) - (10) - (11)
4/16/87	21	17	0	0	0	0	0	17	12	5	0	0	0	0
4/23/87	28	20	3	3	0	3	0	12		0	0	0	0	
4/30/87	31	27	10	10	0	10	0	15	12	10	0	0	0	10
5/8/87	36	33	18	18	0	18	0	15	16	11	5	5	0	6
5/21/87	38	37	22	22	0	22	0	15	22	20	5	5	0	15

Appendix A

24" Strap Anchor Spacing

Some ultrasonic test results have shown strap anchor spacings of 24" (± 1 ") on center. The shop drawings for these embedment plates show a spacing of 18". It was suspected that the spacing of 24" may have resulted from either a detailer-fabricator interface not recorded on the shop detail drawing or from a misinterpretation of the detail drawing.

Further review of the data available leads one to believe that the 24" spacing resulted from a misinterpretation of the shop detail drawing. The following is the basis of our belief.

At present a total of 12 plates have been found to have strap anchor spacings of 24". These plates form a portion of the plates detailed on shop detail drawing number 4. This drawing details all ceiling embedment plates at elevation 517'-6" in the Dresden Unit 2 Reactor Building. This is the lowest slab elevation in the plant complex that has ceiling embedment plates. Hence we believe that this was the first slab with ceiling embedments which was constructed at the plant. A portion of shop detail drawing number 4 is included as Figure A1. As shown, the detailing method was to present a generic plan of embedment plate with strap location indicated by the string of dimensions X, Y spaces @ 9", X. The details of individual plates are specified by assigning each plate a piece mark designation and tabulating the data for that plate. Figure A1 shows this plan and a portion of the table. Thus per this table, 66 plates with PC MK "A" were to be fabricated; each with

- a plate length of 10'-0"
- 13 strap anchors per plate
- the dimension string intended to read 6", 12 spaces @ 9", 6".

All of the plates presently found to have 24" spacing are Piece Mark A plates. We believe that these were some of the first plates fabricated. Lacking any further data, we also believe that some of these plates were fabricated with the dimension string incorrectly interpreted to mean 6", 9 spaces @ 12", 6". Such a string of dimension will of course yield a 24" spacing of anchors along each longitudinal edge of plate.

If such reasoning were the complete explanation, one would tend to believe that all plates with piece mark A have 24" spacing. This however is not true. Ultrasonic test results show that 10 other piece mark A plates at this elevation have anchors spaced at 18" (± 1 "). A possible explanation of this fact is as follows:

Shop detail drawing number 4 was voided on January 12, 1967, and a completely new drawing number 4 was prepared. A portion of this new drawing number 4 is shown as Figure A2. The presentation scheme is essentially the same. In this case, however, the string dimension now reads $1\frac{1}{2}$ ", 13 spaces @ 9", $1\frac{1}{2}$ ". This new drawing has a note which reads.

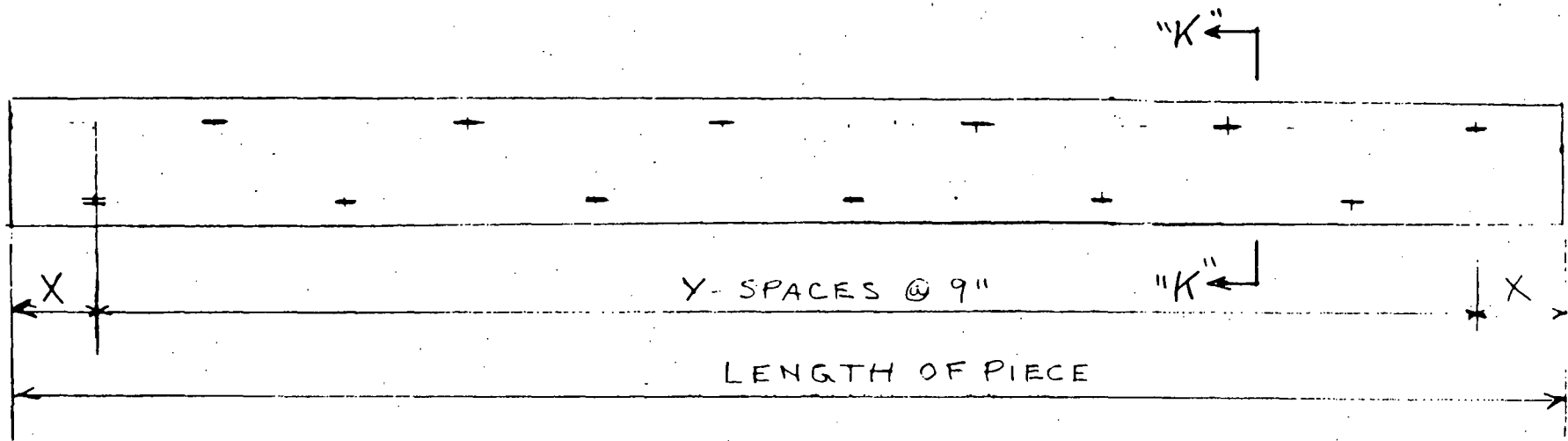
"Strap anchor changes to be effective only for added plates and not affecting plates already on job site per previously approved shop drawing"

Based on this we believe the following:

1. The 6" end distance was changed to $1\frac{1}{2}$ ".
2. Strap anchor spacing of 26" has not been found. This would have been the case had the incorrect interpretation of the dimension string continued, i.e., "13 spaces" would have been misinterpreted to be 13" dimension.

Thus, at present we believe that a limited number of piece mark A plates were fabricated with 24" spacing. We also believe that the error was limited to only Piece Mark A of sheet 4, elevation 517'-6", Reactor Building, Dresden Unit 2.

The UT results indicate that the 24" spacing at present occurs to a very limited extent. We are continuing the analytical work to confirm that the 24" spacing has minimal generic impact.



RIPPEL SH. 4. (VOID) REVISED 1-12-67
 JOB. 6682

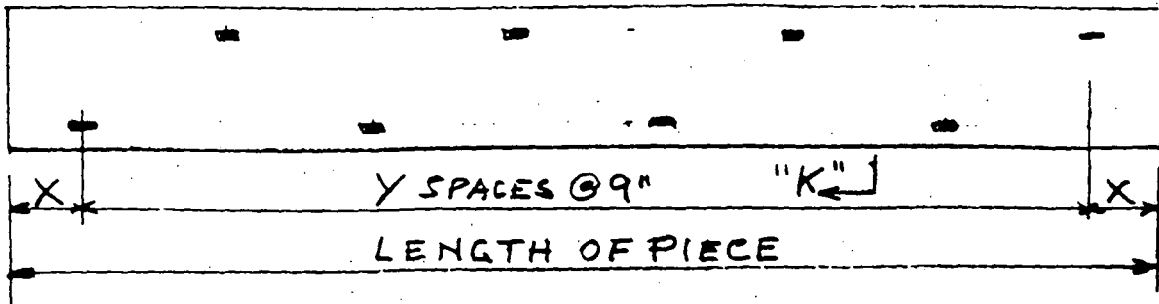
FIGURE A1

PORTION OF SHOP DETAIL DRAWING #4 (ORIGINAL)

LAST DATE
 12-12-66 FOR SHOP
 DATE DWG WAS STARTED
 11-11-66
 FOR B-260 & B-261
 (UNIT 2)
 DISTRIBUTION 12-8-66

PC MK	NO. REQ'D	LENGTH OF PC.	STRAP ANCHORS			
			PER. PC.	TOTAL 858	X (in.)	Y
A	132 ⁶⁶	10'-0"	13	1716	6"	12
B	4 &	7'-0"	9	36 &	6"	8
C	2 *	2'-9"	4	8 &	3"	3
D	5 &	3'-0"	4	20 &	4 1/2"	3
E	2 *	9'-0"	12	24 &	4 1/2"	11
F	10 &	5'-0"	7	70 &	3"	6
G	1 &	9'-6"	13	13 &	3"	12
H	2 *	6'-6"	9	18 &	3"	8

INFORMATION
 FROM THE SAME
 DRAWING ADDED
 HERE BY SPL.



PC. MK	NO. REQ.	LENGTH OF PC.	STRAP ANCHORS			
			PER. PC	TOTAL	"X"	"Y"
A	83	10'-0"	14 X	1162 1089	1 1/2" X	13 X
B	4	7'-0"	10 X	40 X	1 1/2" X	9 X
C	2	2'-9"	4	8	3"	3
D	10 X	3'-0"	4	40 X	4 1/2"	3
E	3	9'-0"	12	36	4 1/2"	11
F	20	5'-0"	7	140	3"	6
G	2	9'-6"	13	26	3"	12
H	3 X	6'-6"	9	36	3"	8
J	1	8'-9"	12	12	3"	11
L	7 X	4'-0"	6 X	42 X	1 1/2" X	5 X

RIPPEL SHT 4 (REV.)
 JOB 6682
 DATE DWG. STARTED 1-12-67
 TO SHOP 2-1-67
 EISTR. 2-2-67
 FOR B-260 & B-261 (UNIT 2)

FIGURE A2

PORTION OF SHOP DETAIL
 DRAWING #4 (REVISED)

3

STRAP ANCHOR CHANGES TO BE
 EFFECTIVE ONLY FOR ADDED PLATES
 AND NOT AFFECTING PLATES ALREADY
 ON JOBSITE PER PREVIOUSLY APPROVED
 SHOP DRAWING

INFORMATION FROM
 THE SAME DRAWING
 ADDED HERE BY SFL.