SARGENT & LUNDY
ENGINEERS
CHICAGO

Weekly Status Report

Assessment of Embedment Plates

Status as of June 18, 1987

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

June 18, 1987

I. Introduction

This is the thirteenth 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 of this effort. This thirteenth report consists of a summary of work performed during last week.

II. Dresden Station

The walkdown effort at Dresden Station has been completed on June 5, 1987. A walkthrough has also been performed to obtain a sample of potential outlier attachments. The walkthrough and the walkthrough assessment are discussed in Section IV.

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. None of these hangers represents an upper limit concern. Walkdowns for these hangers will be performed when conditions permit.

III. Quad Cities Station

The walkdown effort at Quad Cities Station has been completed on June 5, 1987. A walkthrough has also been performed to obtain a sample of potential outlier attachments. The walkthrough and the walkthrough assessment are discussed in Section IV.

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

Due to high radiation in areas of the plant, 22 hangers are presently inaccessible. None of these hangers represents an upper limit concern. Walkdowns for these hangers will be performed when conditions permit.

IV. Current Status of Other Items Affecting Both Dresden and Quad Cities Stations

This section is added in this Status Report to discuss the status of the following items common to both stations.

A. At each conclusion of the walkdown activities at each site, a final walkthrough of the plants was performed in order to identify any potential outliers. Outliers are defined as attachments which were not included in the assessment program and do not satisfy the embedment plate acceptance criteria. Each station has approximately 60HLS drawings which provide strip plate locations . Presently only the areas

shown on about 30 of these drawings are accessible without special Radiation Work Permits or access arrangements. As part of the walkthrough program, 50% of these accessible areas were walked down. Two large bore piping supports and one nonlarge bore support were selected from each area of the plant which was walked down. These supports were then assessed to determine if they are in fact outliers.

The field work of the walkthrough has been completed at each station. The office evaluation for Dresden is complete and no outliers have been identified. The evaluation on Quad Cities is in progress and will be completed by June 23, 1987.

B. As noted in Tables 4A and 4B, 26 supports at Dresden and 22 supports at Quad Cities were found to be inaccessible for walkdown during plant operation. Those supports which were required to be walked down based on upper limit screening criteria have been individually evaluated using available drawing information and found to meet upper limit criteria. These supports will be walked down to ascertain FSAR criteria acceptance when plant conditions permit access.

Embedment plates for 20 supports at Dresden and 2 supports at Quad Cities have been found to be inaccessible for ultrasonic testing during plant operation. Those supports which had ultrasonic testing requests for upper limit have also been individually analyzed using available drawing information and found to meet upper limit criteria. These plates will be ultrasonically tested when plant conditions permit.

The results of the above described assessments of the inaccessible supports for walkdown and ultrasonic testing have not been incorporated in Tables 2A, 2B, 4A, 4B, 5A and 5B at this time.

C. Fabrication detail drawings are not available for approximately 53 plates at Dresden and 10 plates at Quad Cities. To determine the walkdown scope of large bore piping supports attached to these plates, allowable loads for 18" strap spacing were used. In order to confirm the assumption of 18" spacing, 9 plates at Dresden and 10 plates at Quad Cities were ultrasonically tested. The plates chosen for ultrasonic testing at Dresden were the most heavily loaded plates. The testing has confirmed the assumed strap spacing of 18". Based upon these results, the supports attached to these 63 plates are considered qualified.

V. 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

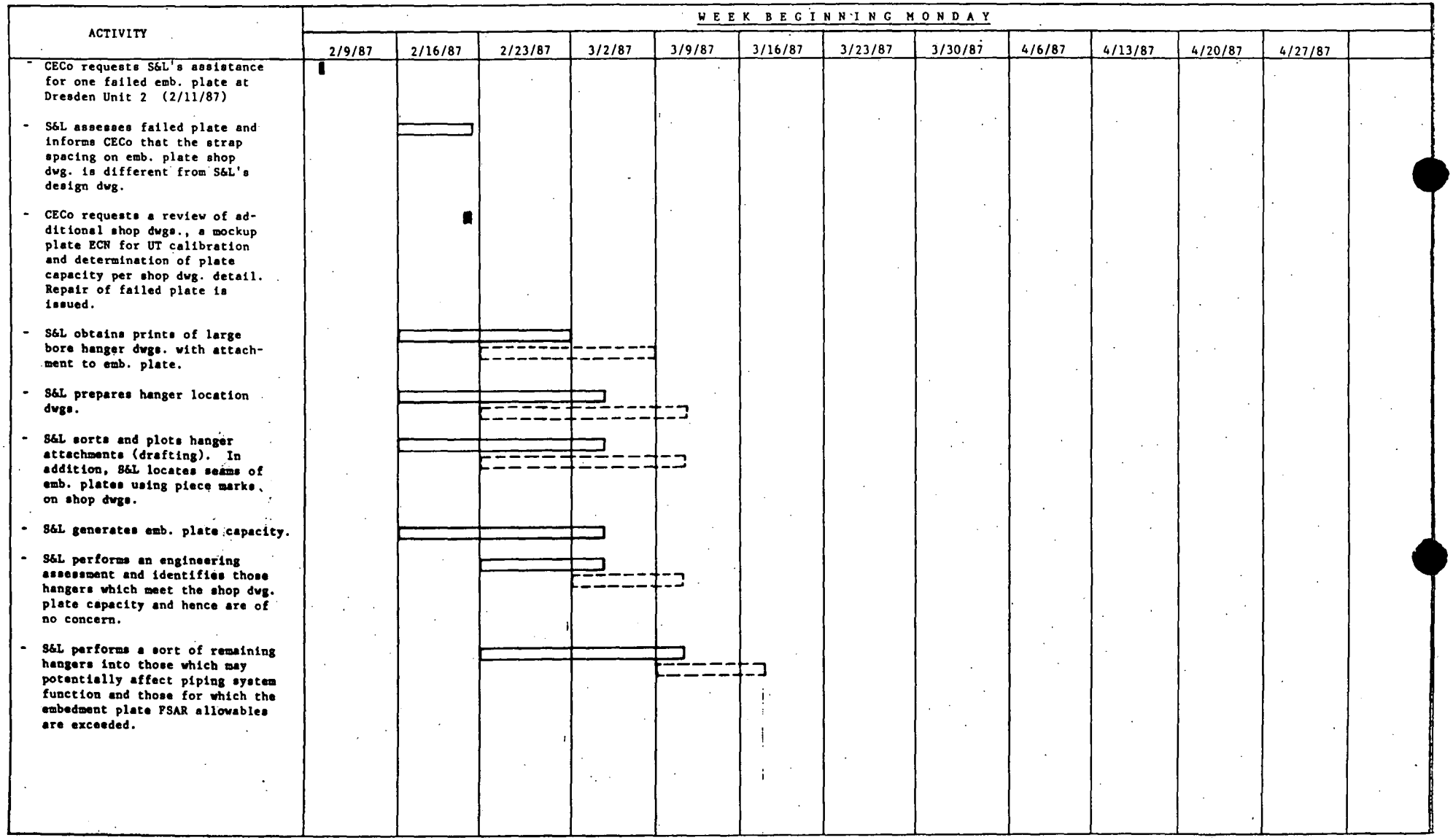
Note: Attachment 1, 2A, 2B, 3A, 3B and Appendix A have not changed. Attachments 4A, 4B, 5A and 5B have been revised to show current cumulative status.

Attachment 1

Dresden 2&3 Bar Chart for Embedment Plate Issue Resolution

Quad Cities 1&2 Bar Chart for Embedment Plate Issue Resolution

DRESDEN — QUAD CITIES



Attachment 1 (Continued)

Dresden 2&3 Bar Chart for Embedment Plate Issue Resolution

Quad Cities 1&2 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
- 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.						CONTINUING						
- S&L utilizes walkdown data to perform a sort of these hangers to identify those hangers which still may potentially affect piping system analysis.									CONTINUING			
- 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.												

Attachment 2A

Status Summary

Dresden

Description	APPROXIMATE NUMBER OF LARGE BORE PIPE HANGERS ON EMBEDMENT PLATES								
	Total	In Unit #2	In Unit #3	Safety Related	Nonsafety Related	Reactor Bldg.	Turbine Bldg.	Loads > Upper Limit	Loads > FSAR
Large bore hangers collected for follow-up work	2230	1060	1170	750	1480	1460	770	-	-
Result of first sort using generic $2\frac{1}{2}$" x $2\frac{1}{2}$" attachment size allowable limits (number of hangers requiring follow-up work)	440	230	210	170	270	380	60	250	190
Results of second sort using generic larger attachment size allowable limits where applicable (number of hangers requiring follow-up work)	462	276	186	137	325	345	117	234*	228**
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.

* 89 Safety-related, 145 Nonsafety-related
** 48 Safety-related, 180 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)	210	105	105	100	110	163	47	114*	96**
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.

*53 Safety-related, 61 Nonsafety-related
**47 Safety-related, 49 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 indicate are approximate.

Bldg - Unit	Unit #2	Unit #3	Total
Reactor Building	360	470	830
Turbine Building	125	133	258
Total	485	603	1088

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	405	404	809
Turbine Building	211	212	423
Total	616	616	1232

ATTACHMENT 3A

Phase i Walkdown and Evaluation Status Summary - Dresden

Note: Evaluate = Compare loads with upper limit and FSAR allowables for the specific attachment location to determine whether these limits are satisifed.

Cumulative Status as of	APPROXIMATE NUMBER OF UPPERLIMIT HANGERS (UL)							APPROXIMATE NUMBER OF FSAR HANGERS				
	Walked Down	Evaluated	SORT OF EVALUATED HANGERS				Being Evaluated	Walked Down	Evaluated	Sort of Evaluated Hangers		Being Evaluated
			Satisfies Upper Limit	Satisfies FSAR (Subset of 3)	UT Requested Because Does Not Satisfy UL (Subset of 6)	UT Requested Because Does Not Satisfy FSAR				Satisfies FSAR	UT Requested Because Does Not Satisfy FSAR	
	①	②	③	④	⑤=②-③	⑥=②-④	⑦=①-②	⑧	⑨	⑩	⑪=⑨-⑩	⑫=⑧-⑨
3/18/87	43	18	12	7	6	11	25	30	3	3	0	27
3/26/87	71	67	46	38	21	29	4	64	50	33	17	14
4/2/87	107	99	61	50	38	49	8	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	55	50	71	12	105	93	56	37	12
4/23/87	148	141	85	62	56	79	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	93	12	147	144	88	56	3
5/21/87	180	178	107	74	71	104	2	154	153	88	65	1
5/28/87	180	179	107	74	72	105	1	154	154	89	65	0
6/4/87	181	181	108	70	73	111	0	188	184	97	87	4
6/18/87	181	181	108	70	73	111	0	186	186	99	87	0

Summary as of 6/18/87

Item	Approximate Number of Hangers
Walked Down (Column ① + Column ⑧)	367
Presently inaccessible (Section II)	27
Physically removed (See Note 1)	68
Remain to be walked down	0
Total of above lines = Total in walkdown scope (Attachment 2A)	462

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

ATTACHMENT 4B

Phase 1 Walkdown and Evaluation Status Summary - Quad Cities

Note: Evaluate = Compare loads with upper limit and FSAR allowables for the specific attachment location to determine whether these limits are satisfied.

Cumulative Status as of	APPROXIMATE NUMBER OF UPPER LIMIT HANGERS (UL)							APPROXIMATE NUMBER OF FSAR HANGERS				
	Walked Down (1)	Evaluated (2)	SORT OF EVALUATED HANGERS: Satisfies Upper Limit (3)	Satisfies FSAR (Subset of 3) (4)	UT Requested Because Does Not Satisfy UL (5)=(2)-(3) (Subset of (6))	UT Requested Because Does Not Satisfy FSAR (6)=(2)-(4)	Being Evaluated (7)=(1)-(2)	Walked Down (8)	Evaluated (9)	Sort of Evaluated Hangers: Satisfies FSAR (10)	UT Requested Because Does Not Satisfy FSAR (11)=(9)-(10)	Being Evaluated (12)=(8)-(9)
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	23	14	9	4
4/23/87	52	48	20	16	28	32	4	27	23	18	5	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
5/28/87	68	68	27	19	41	49	0	42	40	26	14	2
6/4/87	83	83	30	19	53	64	0	46	43	25	18	3
6/18/87	95	95	33	21	62	74	0	66	66	43	23	0

Summary as of 6/18/87

Item	Approximate Number of Hangers
Walked down (Column (1) + Column (8))	161
Presently inaccessible (Section III)	22
Physically removed (See Note 1)	27
Remain to be walked down	0
Total of above lines = Total in walkdown scope (Attachment 2B)	210

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

Cummulative 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: Upper Limit UL — Satisfies UL	Sort of Evaluated Hangers: Upper Limit UL — Does Not Satisfy UL	Sort of Evaluated Hangers: FSAR Limit — Satisfies FSAR	Sort of Evaluated Hangers: FSAR Limit — Does Not Satisfy FSAR	Being Evaluated	U.T. Requested Columns (11) + (6) - (5) of Attachment 4A	U.T. Received	Evaluated	Sort of Evaluated Hangers — Satisfies FSAR	Sort of Evaluated Hangers — Does Not Satisfy FSAR	Being Evaluated
	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	50	39	15	15	0	14	1	24	58	26	12	12	0	14
4/23/87	56	48	30	30	0	28	2	18	67	43	18	18	0	25
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	42	42	0	39	3	22	98	81	43	43	0	38
5/28/87	72	66	42	42	0	39	3	24	98	81	45	45	0	36
6/4/87	73	66	49	49	0	46	3	17	125	109	77	77	0	32
6/18/87	73	66	62	62	0	59	3*	4	125	111	107	107	0	4

*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.

Cummulative 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	5
4/23/87	28	20	3	3	0	3	0	17	9	6	0	0	0	6
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
5/28/87	41	38	24	24	0	24	0	14	22	20	5	5	0	15
6/4/87	53	40	30	30	0	30	0	10	29	23	10	10	0	13
6/18/87	62	49	37	37	0	37	0	12	35	34	21	21	0	13

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", $\frac{9}{12}$" spaces @ 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 1½", 13 spaces @ 9", 1½". 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 1½".

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.

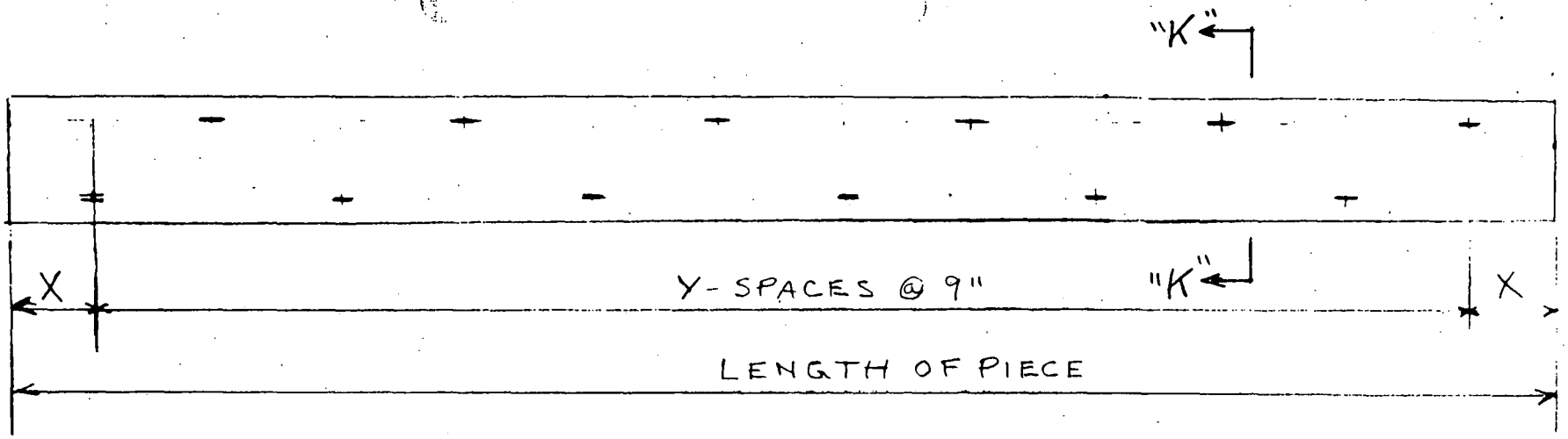


FIGURE A1

PORTION OF SHOP DETAIL DRAWING #4 (ORIGINAL)

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

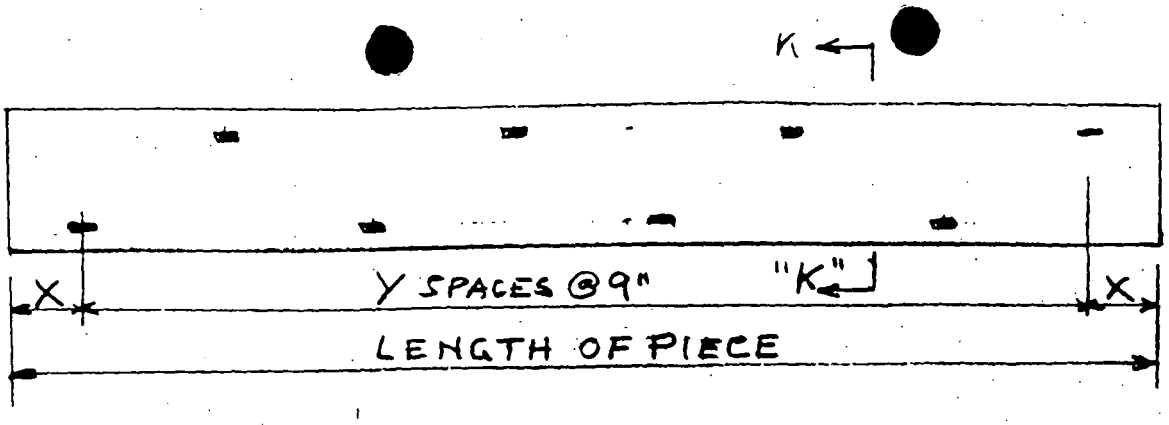
LAST DATE
12-12-66 FOR SHOP

DATE DWG. WAS STARTED
11-11-66

FOR B-260 & B-261
(UNIT 2)
DISTRIBUTION 12-8-66

INFORMATION FROM THE SAME DRAWING ADDED HERE BY S&L.

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 ~~8~~	7'-0"	9	36 ~~72~~	6"	8
C	2 ~~4~~	2'-9"	4	8 ~~16~~	3"	3
D	5 ~~10~~	3'-0"	4	20 ~~40~~	4½"	3
E	2 ~~4~~	9'-0"	12	24 ~~48~~	4½"	11
F	10 ~~20~~	5'-0"	7	70 ~~140~~	3"	6
G	1 ~~2~~	9'-6"	13	13 ~~26~~	3"	12
H	2 ~~4~~	6'-6"	9	18 ~~36~~	3"	8



PC. MK	NO. REQ.	LENGTH OF PC.	STRAP ANCHORS			
			PER. PC	TOTAL	"X"	"Y"
A	83	10'-0"	14	~~1162~~ 1089	1½"	13
B	4	7'-0"	10	40 ~~36~~	1½"	9
C	2	2'-9"	4	8	3"	3
D	10 ~~8~~	3'-0"	4	40 ~~32~~	4½"	3
E	3	9'-0"	12	36	4½"	11
F	20	5'-0"	7	140	3"	6
G	2	9'-6"	13	26	3"	12
H	3 ~~4~~	6'-6"	9	36	3"	8
J	1	8'-9"	12	12	3"	11
L	7 ~~6~~	4'-0"	6 ~~4~~	42 ~~24~~	1½ ~~2~~"	5 ~~4~~

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

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 S&L.

FIGURE A2

PORTION OF SHOP DETAIL DRAWING #4 (REVISED)