

Attachment  
CEC-99-117

PIPING CONFIGURATION VERIFICATION PROGRAM  
STATUS REPORT

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

Prepared by

NUTECH Engineers

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## 1.0 INTRODUCTION

This report describes the status of activities being performed to resolve the issues regarding apparent discrepancies found between the as-built and as-analyzed condition of certain Mark I torus attached piping at Dresden Units 2 & 3 and Quad Cities Units 1 & 2. A previous report, "Program Description and Status Report," NUTECH Document CEC-99-024, dated June 22, 1987, describes the background, the details of the program for resolution, and the status of the effort at that time.

The purpose of this report, issued biweekly, is to advise the NRC of the current status of work being performed and to highlight any new developments. The previous status report, CEC-99-111, was dated September 23, 1987.

## 2.0 STATUS SUMMARY

The status of all piping models is summarized on Table 2-1. As can be seen from the Table, the FSAR compliance evaluations are completed on 32% (22/65) of the models, including three models which have no discrepancies. Two models (Q1.09.2 and Q1.10.1) have been completed since the last report. These two models represent a total of 14 DDRs (including 3 DDRs previously resolved). In addition, in the course of ongoing evaluations and reviews of piping models, seven models have been "declassified" from a HIGH probability of Mark I reanalysis, to MEDIUM or LOW probability. Similarly, six models have been declassified from MEDIUM to LOW, since the last report. The net result, at present, is that only seven models are classified as HIGH probability of reanalysis, and 12 models are

classified as MEDIUM probability of reanalysis. Two weeks ago, there were 12 and 12 models in the HIGH and MEDIUM categories, respectively. The seven remaining models classified as having HIGH probability of reanalysis are still being reviewed for reconciliation approach. Tables 2-2 and 2-3 give the detailed status on a model-by-model basis.

Figures 2-1 and 2-2 and Tables 2-4 and 2-5 summarize the status by DDRs for Dresden and Quad Cities, respectively. The figures show the DDR status superposed on the program logic diagram. The tables present essentially the same information in tabular format, with "% complete" added.

The formal assessments to demonstrate operability for the five piping models which had DDRs that "failed" second level screening are complete, as reported previously. All models were shown to satisfy operability criteria. FSAR evaluations for these are in process. Other models are in various stages of being addressed for FSAR compliance, as shown on Tables 2-2 and 2-3, and Figures 4-1 and 4-2.

Table 2-1  
MODEL STATUS SUMMARY

Status Date: 10/7/87

	Number of Models		
	Dresden	Quad	Total
1. Models with no DDRs	3	0	3
2. Models Formally Assessed for Operability	3	2	5
3. FSAR Compliance Evaluation Complete*	9	13	22
4. Models Being Reviewed for Reconciliation Approach	3	4	7
5. Models Working or Scheduled for FSAR Resolution	10	18	28
TOTALS			
	28	37	65

\* In addition, FSAR compliance evaluation is complete for one of the models formally assessed for operability (Q2.09.1).

Table 2-2

## DRESDEN 2 &amp; 3 MODEL STATUS

Status Date: October 7, 1987

MODEL #	DESCRIPTION	NO. OF DDRs	TYPE OF EVALUATION	PROBABILITY OF REANALYSIS	RESOLUTION STATUS	COMPLETION DATE	COMMENTS
2.02	ECCS Suction Header	10	Reanalysis	100%	In Progress	11/09/87	Reanalyzed for operability.
2.03/.06	LPCI 2A/B and CS 2A Suction	4	Manual	0	Completed	09/01/87	
2.04/.07	LPCI 2C/D and CS 2B Suction	4	Manual	0	In Progress	10/13/87	
2.05	HPCI Pump Suction	1	Manual	0	Completed	09/01/87	
2.08	LPCI Disch. (X310A)	10	Manual	Low	In Progress	10/19/87	
2.09.1	LPCI 2C/D and CS 2B Disch.	13	Reanalysis	High	Under Review	10/19/87	Review for reconciliation approach.
2.09.2	LPCI 2C/D and CS 2B Disch.	0	---	0	Completed	06/01/87	No DDRs
2.10	Vacuum Relief	1	Manual	0	Completed	09/01/87	
2.11	Pressure Suppression	3	Manual	Low	In Progress	10/19/87	
2.12	HPCI Turbine Exhaust	2	Manual	0	Completed	09/01/87	
2.13.1	LPCI Disch. (X311A)	5	Manual	Low	In Progress	10/19/87	
2.13.2/14.2	LPCI Disch. (X311A/B)	7	Manual	Low	In Progress	10/13/87	
2.14.1	LPCI Disch. (X311B)	6	Reanalysis	High	Under Review		Review for reconciliation approach.
3.02	ECCS Suction Header	10	Reanalysis	100%	In Progress	11/09/87	Reanalyzed for operability.
3.03/.06	LPCI 3A/B and CS 3A Suction	5	Manual	Low	In Progress	11/02/87	
3.04/.07	LPCI 3C/D and CS 3B Suction	7	Manual	0	In Progress	10/19/87	Resolve EAS comments on need for mod.
3.05	HPCI Pump Suction	6	Manual	0	Completed	09/01/87	
3.08.1/08.3	LPCI Disch. (X310A)	8	Manual	0	Completed	09/04/87	
3.08.2	LPCI Disch. (X310A)	0	---	0	Completed	06/01/87	No DDRs
3.09.1	LPCI Disch. (X310B)	7	Manual	Low	In Progress	11/09/87	
3.09.2/09.3	Core Spray (X310B)	3	Manual	0	Completed	09/17/87	
3.10	Vacuum Relief	11	Reanalysis	100%	In Progress	11/02/87	Reanalyzed for operability.
3.11	Pressure Suppression	3	Manual	0	Completed	09/04/87	
3.12	HPCI Turbine Exhaust	0	---	0	Completed	06/01/87	No DDRs
3.13.1	LPCI Disch. (X311A)	7	Manual	Low	In Progress	11/16/87	
3.13.2/14.2	LPCI Disch. (X311A&B)	4	Manual	0	Completed	09/17/87	
3.13.3	LPCI Disch. to Drywell (X145)	3	Manual	Medium	To Be Scheduled	---	
3.14.1/14.3	LPCI Disch. (X311B & X150)	5	Reanalysis	High	Under Review		Review for reconciliation approach.
TOTALS:	28 Models	145 DDRs			12 Completed (incl. 3 w/o DDRs)		

Table 2-3  
 QUAD CITIES 1 & 2 MODEL STATUS

Status Date: October 7, 1987

MODEL #	DESCRIPTION	NO. OF DDRs	TYPE OF EVALUATION	PROBABILITY OF REANALYSIS	RESOLUTION STATUS	COMPLETION DATE	COMMENTS
01.02	ECCS Suction Header	1	Manual	Low	In Progress	10/26/87	
01.03	RCIC Pump Suction	5	Manual	Low	To Be Scheduled	---	
01.04	HPCI Pump Suction	6	Manual	Low	In Progress	10/12/87	
01.05	RHR Pump 1A/B Suction	7	Manual	Medium	In Progress	11/16/87	
01.06	RHR Pump 1C/D Suction	9	Manual	Medium	To Be Scheduled	---	
01.07	CS Pump 1A/B Suction	6	Manual	Medium	To Be Scheduled	---	
01.08	Vacuum Relief	6	Manual	0	Completed	09/17/87	
01.09.1	RHR Pump 1A/B Disch.	5	Manual	0	Completed	09/17/87	
01.09.2	RHR Pump 1A/B Disch.	7	Manual	0	Completed	09/23/87	
01.09.3	RHR Pump 1A/B Disch.	5	Manual	0	Completed	09/04/87	
01.10.1	CS Pump 1A/B Disch.	7	Manual	0	Completed	09/23/87	
01.10.2	CS Pump 1A/B Disch.	9	Manual	Medium	Scheduled	11/16/87	
01.11.1	RHR Pump 1C/D Disch.	5	Manual	Medium	To Be Scheduled	---	
01.11.2	RHR Pump 1C/D Disch.	11	Manual	Medium	Scheduled	11/30/87	
01.11.3	RHR Pump 1C/D Disch.	1	Manual	0	Completed	09/07/87	
01.13	HPCI Turbine Exhaust	6	Manual	Low	In Progress	10/12/87	
01.14	RCIC Turbine Exhaust	2	Manual	0	Completed	09/01/87	
01.15	Pressure Suppression	2	Manual	Medium	Scheduled	11/23/87	
02.02	ECCS Suction Header	1	Manual	Low	In Progress	11/30/87	
02.03	RCIC Pump Suction	3	Manual	Medium	Scheduled	11/30/87	
02.04	HPCI Pump Suction	6	Reanalysis	100%	In Progress	11/02/87	Reanalyzed for operability.
02.05	RHR Pump 2A/B Suction	19	Reanalysis	High	Under Review	---	Review for reconciliation approach.
02.06	RHR Pump 2C/D Suction	9	Manual	Medium	To Be Scheduled	---	
02.07	CS Pump 2A/B Suction	21	Reanalysis	High	Under Review	---	Review for reconciliation approach.
02.08	Vacuum Relief	4	Manual	Low	In Progress	10/19/87	
02.09.1	RHR Pump 2A/B Disch.	2	Reanalysis	100%	Completed	09/09/87	Reanalyzed for operability.
02.09.2	RHR Pump 2A/B Disch.	10	Manual	Medium	Scheduled	11/30/87	
02.09.3	RHR Pump 2A/B Disch.	3	Manual	Low	In Progress	10/14/87	
02.10.1	CS Pump 2A/B Disch.	12	Manual	Medium	To Be Scheduled	---	
02.10.2	CS Pump 2A/B Disch.	1	Manual	0	Completed	09/07/87	
02.10.3	CS Pump 2A/B Disch.	3	Manual	0	Completed	09/01/87	
02.11.1	RHR Pump 2C/D Disch.	15	Reanalysis	High	Under Review	---	Review for reconciliation approach.
02.11.2	RHR Pump 2C/D Disch.	-	---	High	Under Review	---	Review for reconciliation approach.
02.11.3	RHR Pump 2C/D Disch.	1	Manual	0	Completed	09/01/87	
02.13	HPCI Turbine Exhaust	5	Manual	0	Completed	09/23/87	
02.14	RCIC Turbine Exhaust	3	Manual	0	Completed	09/17/87	
02.15	Pressure Suppression	1	Manual	0	Completed	09/07/87	
TOTALS:	37 Models	219 DDRs			14 Completed		

Table 2-4  
 DDR STATUS SUMMARY  
 DRESDEN 2 & 3

Status Date: 10/07/87

Activity Description	Total Scope	Completed	% Complete
Configuration Walkdown			
D2	13	13	100%
D3	<u>15</u>	<u>15</u>	<u>100%</u>
Total (Models)	28	28	100%
Model Review			
D2	13	13	100%
D3	<u>15</u>	<u>15</u>	<u>100%</u>
Total (Models)	28	28	100%
1st Level Judgement of DDRs			
D2	66	66	100%
D3	<u>79</u>	<u>79</u>	<u>100%</u>
Total (DDRs)	145	145	100%
2nd Level Screening of First Priority DDRs			
D2	17	17	100%
D3	<u>22</u>	<u>22</u>	<u>100%</u>
Total (DDRs)	39	39	100%
2nd Level Screening of Second Priority DDRs			
D2	49	49	100%
D3	<u>57</u>	<u>57</u>	<u>100%</u>
Total (DDRs)	106	106	100%
DDRs Requiring Formal Operability			
D2	1	1	100%
D3	<u>2</u>	<u>2</u>	<u>100%</u>
Total (DDRs)	3	3	100%
DDRs Resolved for FSAR			
D2	66	32	48%
D3	<u>79</u>	<u>29</u>	<u>37%</u>
Total (DDRs)	145	61	42%

Table 2-5  
 DDR STATUS SUMMARY  
 QUAD CITIES 1 & 2

Status Date: 10/07/87

Activity Description	Total Scope	Completed	% Complete
<b>Configuration Walkdown</b>			
QC1	18	18	100%
QC2	19	19	100%
Total (Models)	<u>37</u>	<u>37</u>	<u>100%</u>
<b>Model Review</b>			
QC1	18	18	100%
QC2	19	18	95%
Total (Models)	<u>37</u>	<u>36</u>	<u>97%</u>
<b>1st Level Judgement of DDRs</b>			
QC1	100	100	100%
QC2	119	119	100%
Total (DDRs)	<u>219</u>	<u>219</u>	<u>100%</u>
<b>2nd Level Screening of First Priority DDRs</b>			
QC1	24	24	100%
QC2	22	22	100%
Total (DDRs)	<u>46</u>	<u>46</u>	<u>100%</u>
<b>2nd Level Screening of Second Priority DDRs</b>			
QC1	76	76	100%
QC2	97	97	100%
Total (DDRs)	<u>173</u>	<u>173</u>	<u>100%</u>
<b>2nd Priority DDRs Requiring Formal Operability</b>			
QC1	0	0	100%
QC2	2	2	100%
Total (DDRs)	<u>2</u>	<u>2</u>	<u>100%</u>
<b>DDRs Resolved for FSAR</b>			
QC1	100	43	43%
QC2	119	32	27%
Total (DDRs)	<u>219</u>	<u>75</u>	<u>34%</u>

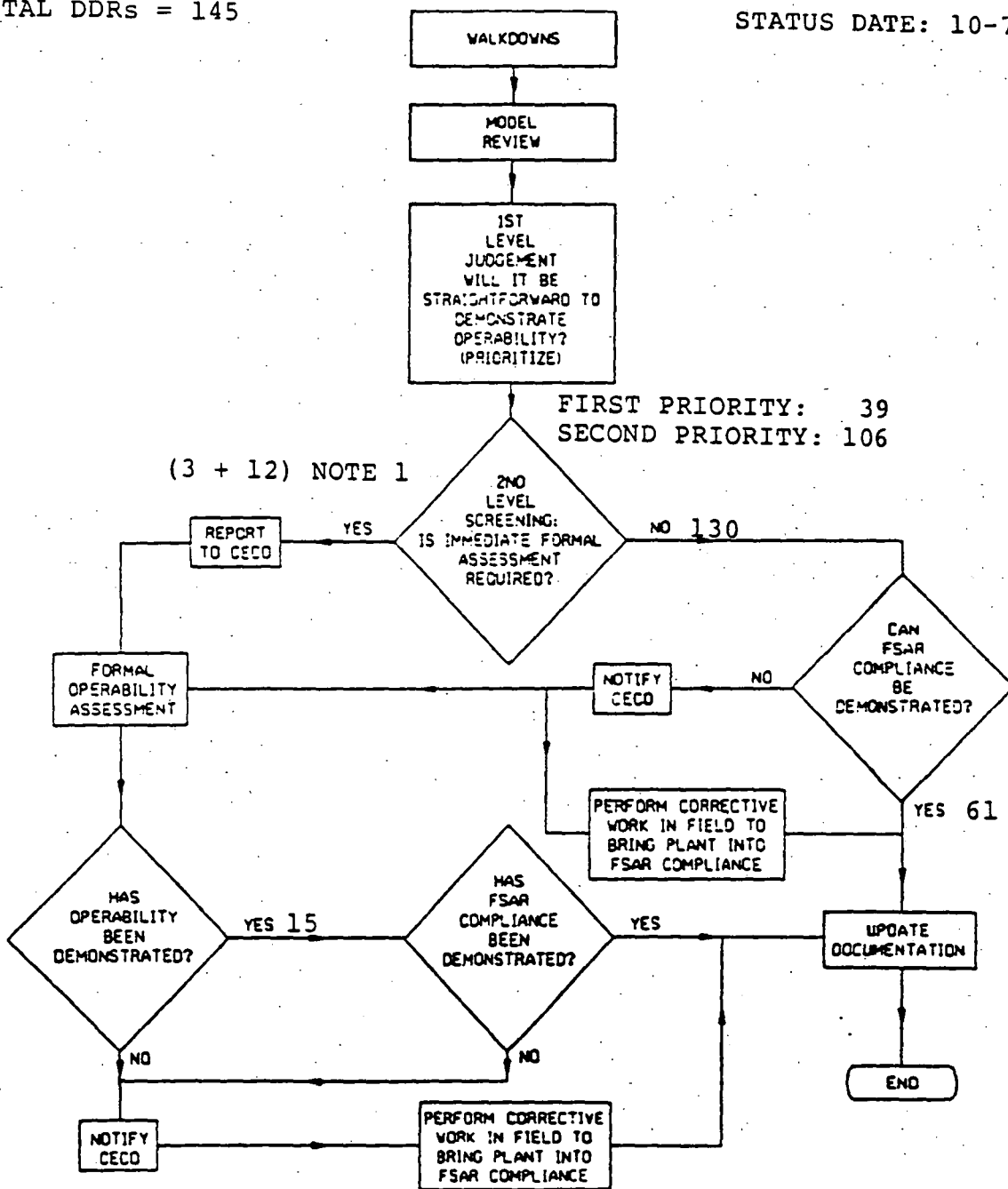


Figure 2-1

DDR STATUS SUMMARY  
DRESDEN 2 & 3

TOTAL DDRs = 145

STATUS DATE: 10-7-87



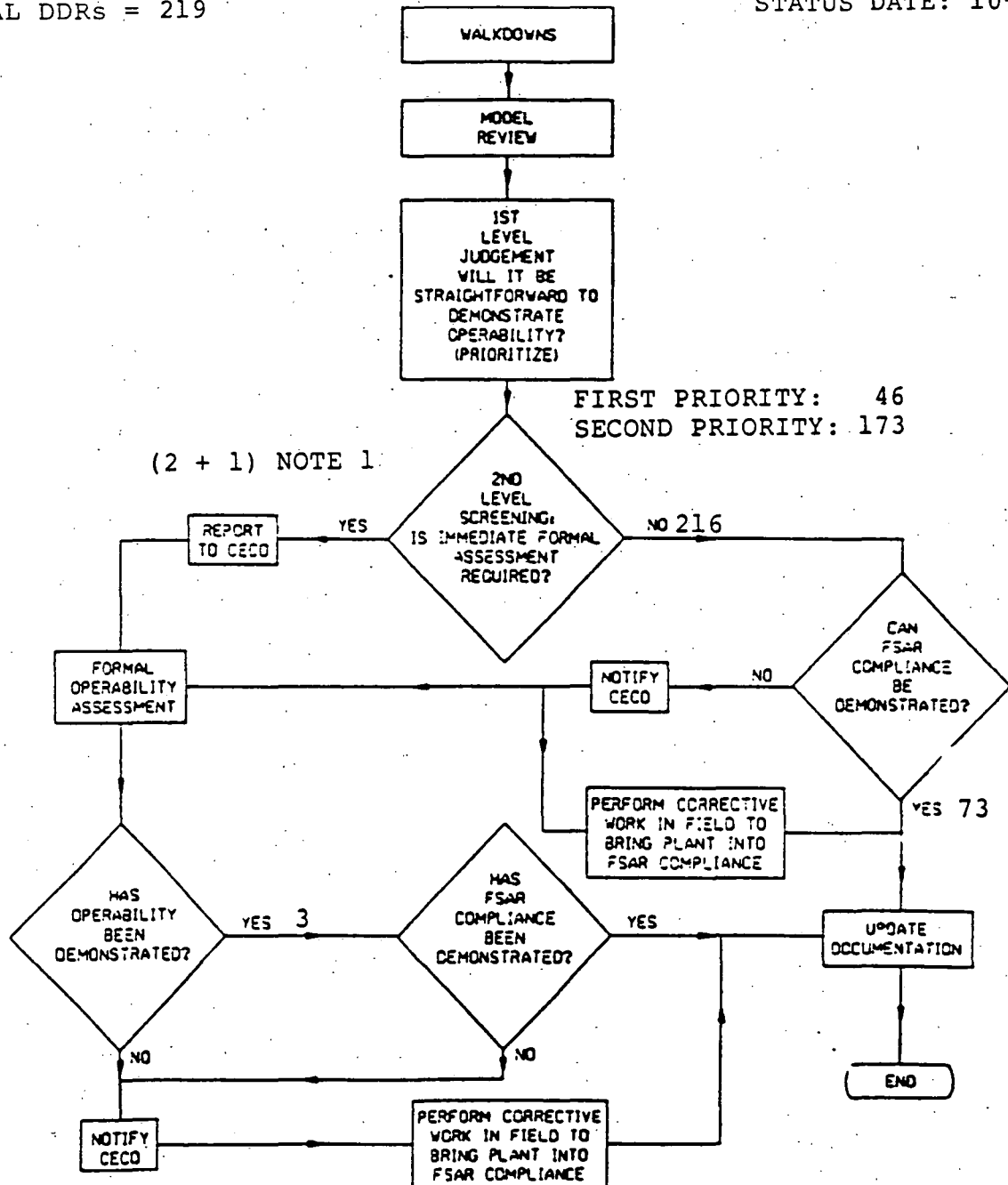
NOTE 1: Three DDRs required formal assessment. Twelve additional DDRs were evaluated with those piping models during formal assessment.

Figure 2-2

DDR STATUS SUMMARY  
QUAD CITIES 1 & 2

TOTAL DDRs = 219

STATUS DATE: 10-7-87



NOTE 1: Two DDRs required formal assessment. Twelve additional DDRs were evaluated with those piping models during the formal assessment.

MAJOR ISSUES

As indicated in the last status report, a reassessment of the overall program and status has been occurring. To date, the following conclusions are becoming evident:

1. Operability for the piping systems within this program has been demonstrated, therefore no immediate safety concerns exist.
2. Of the four categories of discrepancies considered in this program (undemolished pipe supports, mislocated pipe supports, branch connections, and pipe sizes/schedules), the branch connections appear to have the most impact on FSAR criteria compliance, based on evaluations to date. Fortunately, branch connection discrepancies are relatively easy to analyze, and if field corrective work is required, branch connection reinforcements are relatively simple to install. Again, as noted in Item 1 above, operability has been demonstrated for all branch connection discrepancies.
3. All other categories of discrepancies, (other than branch connections), have not, in general, impacted FSAR compliance, based on results to date. This trend is encouraging, because mislocated pipe supports and incorrect pipe sizes/schedules can be the most difficult to analyze, and the most difficult to correct in the field.

4. Based on the accumulated results to date, it is expected that fewer models will require reanalysis than previously reported. As noted in Section 2.0, there is a significant shift from Mark I reanalysis to manual methods for demonstration of FSAR compliance. This is evidenced by the reduced number of models (7 vs. 12) with a HIGH probability of reanalysis. Ongoing review is expected to further reduce this number.

#### 4.0 SCHEDULE

The schedule for FSAR evaluations, on a model-by-model basis, is shown on Figures 4-1 and 4-2. Figure 4-1 (2 pages) shows the models being addressed by manual calculations. Figure 4-2 shows the schedule for the models being reanalyzed. Table 4-1 lists the remaining models.

Table 4-1

MODELS NOT YET SCHEDULED

MODELS UNDER REVIEW FOR RECONCILIATION APPROACH

Dresden

D2.09.1  
D2.14.1  
D3.14.1/D3.14.3

Quad Cities

Q2.05  
Q2.07  
Q2.11.1  
Q2.11.2

MODELS RECENTLY DESIGNATED FOR MANUAL EVALUATION

Dresden

D3.13.3

Quad Cities

Q1.03  
Q1.06  
Q1.07  
Q1.11.1  
Q2.06  
Q2.10.1

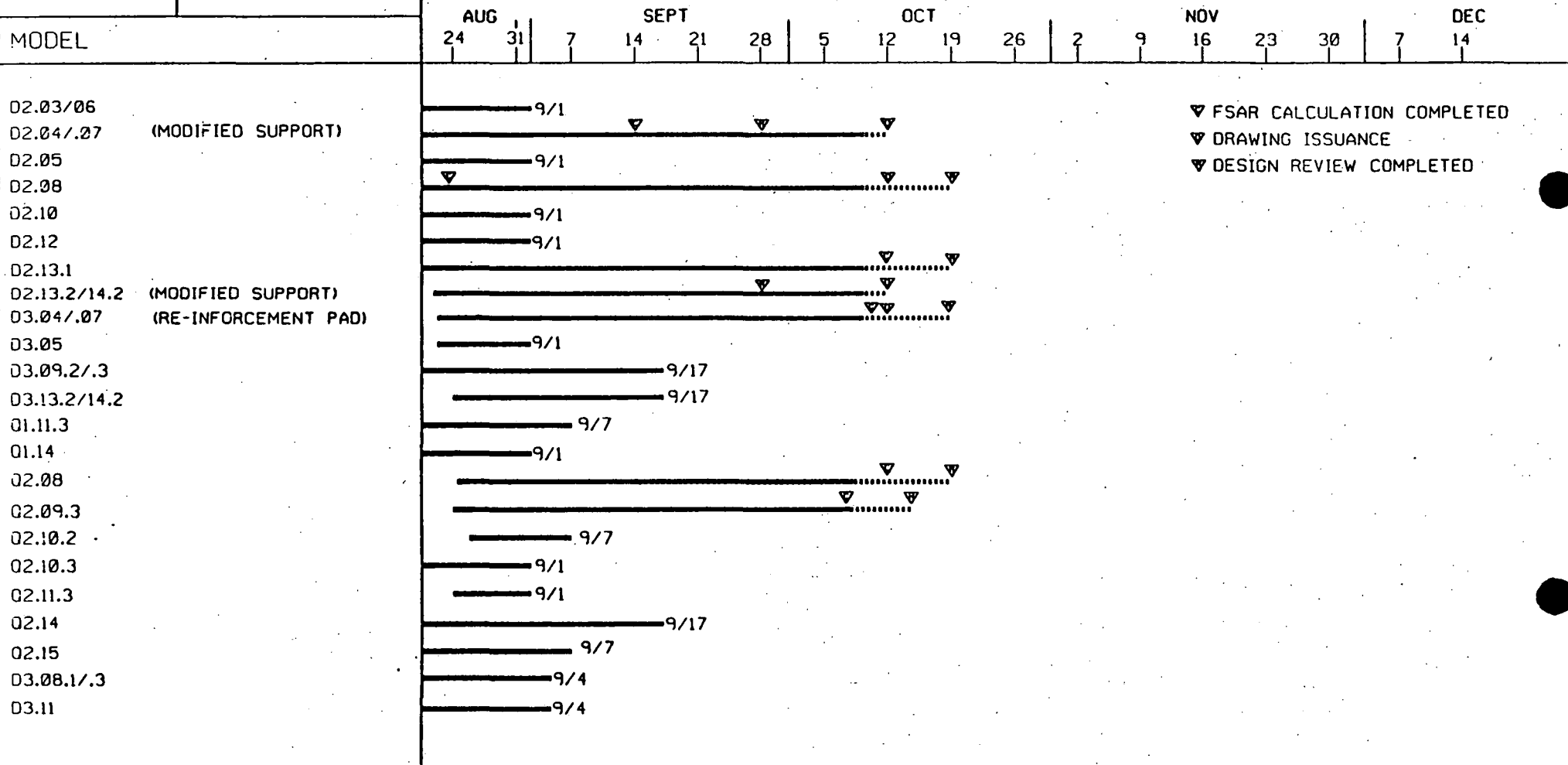


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TECHNICAL JUSTIFICATION

STATUS AS OF: 10 /7/87

FIGURE 4-1



- ▽ FSAR CALCULATION COMPLETED
- ▽ DRAWING ISSUANCE
- ▽ DESIGN REVIEW COMPLETED

..... PLAN      ..... % COMPLETE      ----- COMPLETED PLAN      ▽ MILESTONE      ↓ STATUS DATE

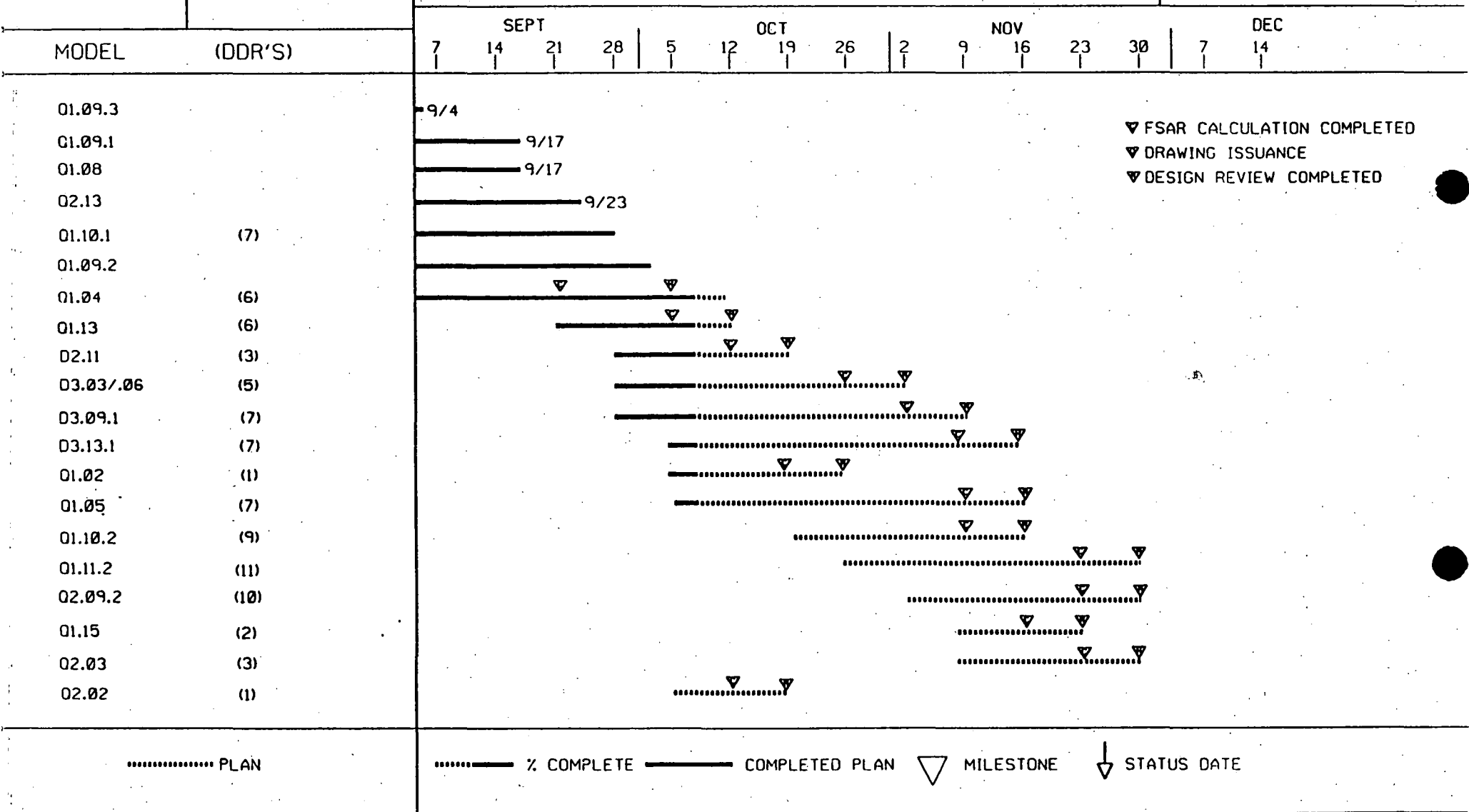


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TECHNICAL JUSTIFICATION

STATUS AS OF: 10 /7/87

FIGURE 4-1



- ▽ FSAR CALCULATION COMPLETED
- ▽ DRAWING ISSUANCE
- ▽ DESIGN REVIEW COMPLETED

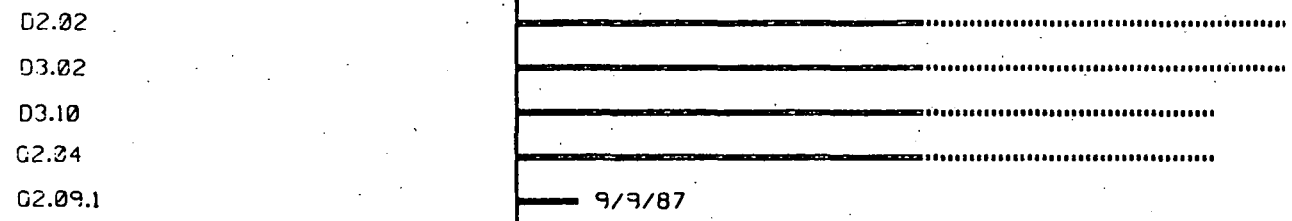
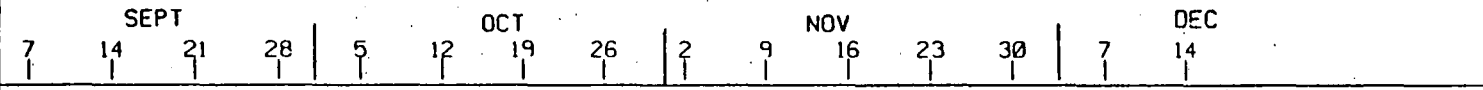


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MARK-1 REANALYSIS  
FIGURE 4-2

STATUS AS OF: 10 /7/87

MODEL (DDR'S)



..... PLAN

..... % COMPLETE    ————— COMPLETED PLAN    ▽ MILESTONE    ↓ STATUS DATE