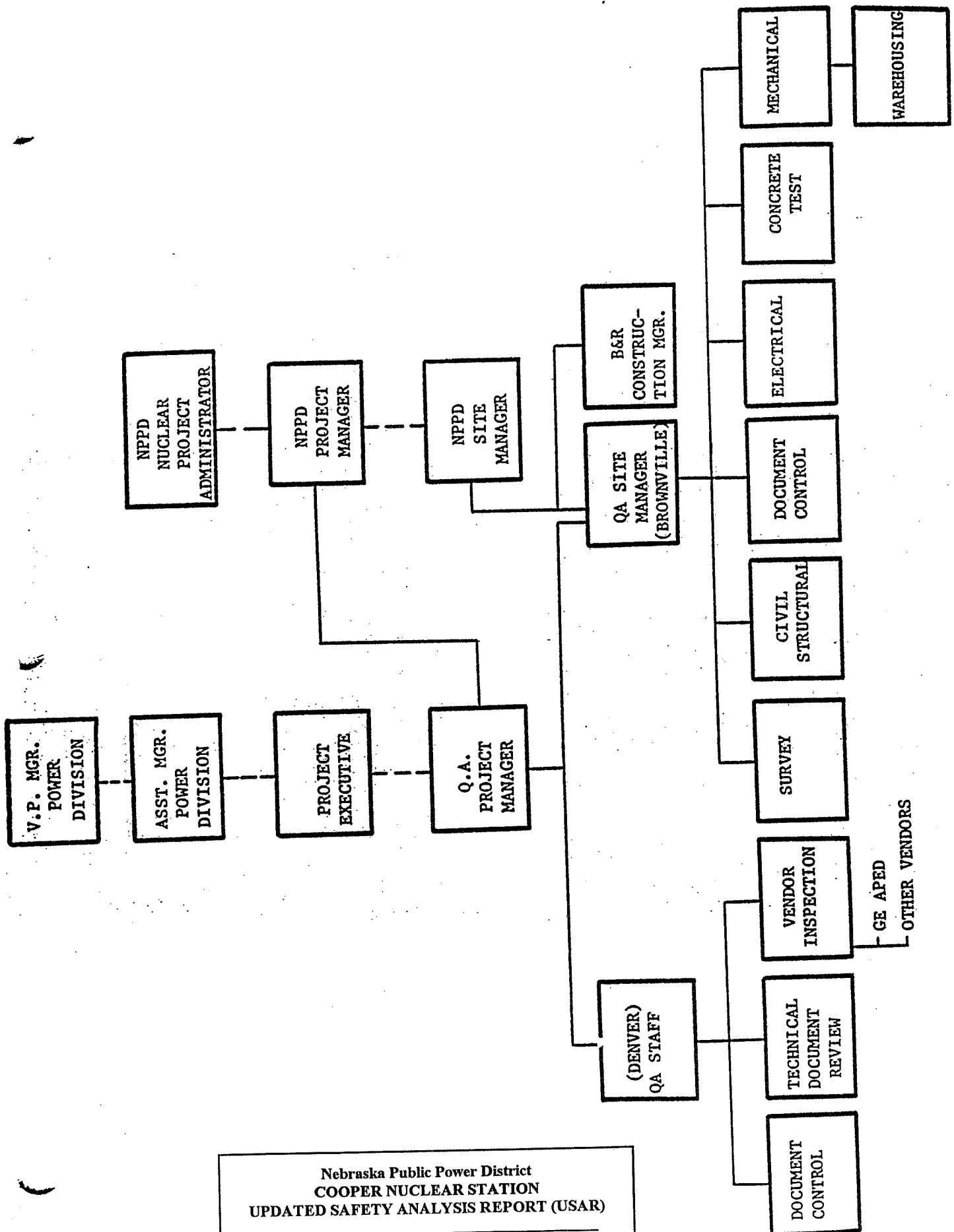


**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

*NPPD-QA Organization  
Cooper Nuclear Station  
Figure D(1)-2-1 10/04/99*



Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

*Stearns-Roger Quality Assurance Organization*  
*Cooper Nuclear Station*  
Figure D(1)-3-1 10/04/99

PAGE \_\_\_\_\_

JOB NO. \_\_\_\_\_ DATE \_\_\_\_\_ BY \_\_\_\_\_ CH'K. \_\_\_\_\_

CUSTOMER Nebraska Public Power Dist. PROJECT Cooper Nuclear Station

SUBJECT Document Review Log

[illegible]

**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

Document Review Log  
Figure D(1)-3-2 10/04/99

DIVISION USAGE						<b>Stearns-Roger</b> CORPORATION <b>Engineering Standard</b>	FE04.1 Page 1
MM	P	PP	SH	FI	SP		
	X					WELD PROCEDURE EVALUATION	ISSUED  REVISED

Customer \_\_\_\_\_ Project \_\_\_\_\_

Contract No. \_\_\_\_\_ S-R No. \_\_\_\_\_

Vendor \_\_\_\_\_

Procedure No. \_\_\_\_\_ Rev. # \_\_\_\_\_ Transmittal No. & Date \_\_\_\_\_

ASME Section IX \_\_\_\_\_ Edition and \_\_\_\_\_ Codes

1. \_\_\_\_\_ Procedure is accepted w/o comment.
2. \_\_\_\_\_ Procedure is accepted as noted below. Revised, corrected procedure is to be resubmitted for record.
3. \_\_\_\_\_ Procedure is not acceptable due to deficiencies noted below. Revised procedure to be resubmitted for approval.
4. COMMENTS. \_\_\_\_\_
  - A. \_\_\_\_\_ All pages are not numbered and/or do not carry procedure number.
  - B. \_\_\_\_\_ Q-1 form number does not agree with weld procedure specification number.
  - C. \_\_\_\_\_ Q-1 form does not carry signature of authorized employee of manufacturer.
  - D. \_\_\_\_\_ All welding processes used for qualification are not designated or process designated is not used for this procedure qualification.
  - E. \_\_\_\_\_ ASME, ASTM or other base metal specifications used are not specified or "F" number is incorrect.
  - F. \_\_\_\_\_ ASME, ASTM or other filler metal specifications are not specified or are incorrect for base material used.
  - G. \_\_\_\_\_ Group "F" number per ASME Section IX, Table Q11.2, is not specified or is incorrect.
  - H. \_\_\_\_\_ Chemical analysis "A" number per ASME Section IX, Table Q11.3, is not specified or is incorrect.
  - I. \_\_\_\_\_ Flux for submerged arc welding not specified or incorrect.

Nebraska Public Power District  
 COOPER NUCLEAR STATION  
 UPDATED SAFETY ANALYSIS REPORT (USAR)

Weld Procedure Evaluation  
 Figure D(1)-3-3 Page 1 of 2 10/04/99

DIVISION USAGE						<b>Stearns-Roger</b> <b>Engineering Standard</b>	FE04.1
MA	P	PP	SH	TI	SP		Page 2
	X						
						WELD PROCEDURE EVALUATION	ISSUED
							REVISED

4. COMMENTS (CONTD)

- J. \_\_\_\_\_ Gas for inert-gas welding not specified, incorrect or incorrect flow range.
- K. \_\_\_\_\_ Position not properly specified or not in accordance with ASME Section IX.
- L. \_\_\_\_\_ Preheat not specified or incorrect for material used.
- M. \_\_\_\_\_ Postweld heat treat cycle not complete or temperatures incorrect.
- N. \_\_\_\_\_ Backing strip use or material not specified.
- O. \_\_\_\_\_ Thickness qualified not stated or incorrect per test material.
- P. \_\_\_\_\_ Preparation of base material improper for this process.
- Q. \_\_\_\_\_ ~~Welding technique, cleaning or appearance of weld improper.~~
- R. \_\_\_\_\_ Defect repairs not specified to a qualified procedure for the process designated.
- S. \_\_\_\_\_ Peening requirements omitted or incorrect.
- T. \_\_\_\_\_ Treatment of backside of double welded joints not specified or incorrect.
- U. Other \_\_\_\_\_

STEARNS-ROGER CORPORATION

BY \_\_\_\_\_

DATE \_\_\_\_\_

Nebraska Public Power District  
 COOPER NUCLEAR STATION  
 UPDATED SAFETY ANALYSIS REPORT (USAR)

Weld Procedure Evaluation  
 Figure D(1)-3-3 Page 2 of 2 10/04/99

PAGE

**JOB NO.**

DATE \_\_\_\_\_

LEY

CH'K

**CUSTOMER**

Nebraska Public Power Dist

PROJECT.

Cooper Nuclear Station

**SUBJECT.**

### Purchase Order and Mill Test Report Status

**MTR's**

**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

*Purchase Order and Mill Test Report Status*  
*Figure D(1)-3-4 10/04/99*

## SHOP INSPECTION OF REACTOR FEED PUMP TURBINES

A. Reference Documents

1. Nebraska Public Power District  
Contract E68-13 and Addendum No. 1 and Amendments No. 1, 2, 3 and 4.  
Reactor Feed Pump Turbines
2. Codes and Standards incorporated by reference
  - a) ASTM - A27; A48; A201; A216; A217; A276; A293; A296; A285;  
B23; B149
  - b) AISI - Type 410; Type 422
  - c) ASME
  - d) AISC
  - e) AWS
  - f) NEMA
  - g) NEC
  - h) IEEE
  - i) NBFU
  - j) Hydraulics Institute
  - k) State of Nebraska local codes and regulations
  - l) Uniform Building Code - International Conference of Building  
Officials

B. Document Reference for Q. A. Checks

1. Turbine Features
  - a) General Requirements - Pg. G-9, Para. 3.1, subpara. a, sub-  
subpara. 1, 2 and 3.
  - b) Casing, Lagging and Blading - Pg. G-9, Para. 3.1, subpara.  
b, sub-subpara. 1, 2, 3, 4 and 5.
  - c) Stop Valves - Pgs. G-9 and G-10, Para. 3.1, subpara. c.
  - d) Governing Devices - Pg. G-10, Para. 3.1, subpara. d, sub-  
subpara. 1, 2 and 3.

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

*Shop Inspection Checklist - Example:  
Shop Inspection of Reactor Feed Pump Turbines  
Figure D(1)-3-5 Page 1 of 5 10/04/99*

B. Document Reference for Q. A. Checks (cont'd)

- e) ~~Protective Devices - Pgs. G-10, Para. 3.1, subpara. e; sub-~~  
subpara. 1, 2, 3, 4 and 5.
- f) Lubrication System - Pgs. G-10 and G-11, Para. 3.1, subpara.  
f, sub-subpara. 1, 2, 3, 4, 5, 6, 7 and 8.
- g) Steam Sealing System - Pg. G-11, Para. 3.1, subpara. g.
- h) Turning Gear - Pg. G-11, Para. 3.1, subpara. h.
- i) Instrumentation and Controls - Pgs. G-12 and G-13, Para.  
3.1, subpara. i, sub-subpara. 1, 2, 3, 4, 5, 6, 7, 8, 9,  
10, 11, 12 and 13.
- j) Soles Plates - Pg. G-13, Para. 3.1, subpara. j.
- k) Materials and Workmanship - Pg. G-13, Para. 3.2, subpara.  
a, b, c and d.
- l) Painting and Protection - Pgs. G-13 and G-14, Para. 3.3.
- m) ~~Electrical Requirements - Pgs. G-14 and G-15, Para. 3.4,~~  
subpara. a, b, c, d, e, f, g, h, i and j, sub-subpara. 1  
and 2.
- n) Shop Tests - Pg. G-15 and G-16, Para. 3.5, subpara. a, sub-  
subpara. 1, 2, 3, 4, 5 and 6.
- o) Conformed Data Sheets - Pgs. G-19 thru G-23, Para. 1.0; 1.1;  
1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 1.8; 1.9; 1.10; 1.11; 1.12;  
1.13; 1.14; 1.15; 1.16 and 1.17.
- p) Contractors Drawing Submittal

DeLaval Turbine Incorporated

Drawing No. CC-90946	Latest Revision
Drawing No. CC-90945	Latest Revision
Drawing No. CC-90943	Latest Revision
Drawing No. SO-704564-5	Latest Revision
Drawing No. CCA-1788	Latest Revision
Drawing No. H-3832	Latest Revision
Drawing No. F-8736	Latest Revision
Drawing No. D-60234	Latest Revision
Drawing No. D-60232	Latest Revision

- q) Other Applicable Data - DeLaval Alternate Proposal, T-2001  
Telegrams, May 23 and 24, 1968 and CPPD letter of June 26,  
1968 and DeLaval letter of May 24, 1968 - attached to contract  
documents.

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

*Shop Inspection Checklist - Example:*  
*Shop Inspection of Reactor Feed Pump Turbines*  
*Figure D(1)-3-5 Page 2 of 5 10/04/99*



C. Rejectable Criteria

A check mark under "No" for any item in check list CNS - 20Z12.

CHECK LIST FOR SHOP INSPECTION OF REACTOR FEED PUMP TURBINES

Location of Shop		Yes	No	Not Applicable	Inspector	Date
1.	General Requirements per reference B.1.a					
2.	Casing, Lagging and Blading per reference B.1.b					
3.	Stop Valves per reference B.1.c					
4.	Governing Devices per reference B.1.d					
5.	Protective Devices per reference B.1.e					
6.	Lubrication System per reference B.1.f					
7.	Steam Sealing System per reference B.1.g					
8.	Turning Gear per reference B.1.h					
9.	Instrumentation and Controls per reference B.1.i					
10.	Sole Plates per reference B.1.j					
11.	Materials and Workmanship per reference B.1.k					
12.	Painting and Protection per reference B.1.l					
13.	Electrical Requirements per reference B.1.m					

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Shop Inspection Checklist - Example:  
Shop Inspection of Reactor Feed Pump Turbines  
Figure D(1)-3-5 Page 4 of 5 10/04/99

## CHECK LIST FOR SHOP INSPECTION OF REACTOR FEED PUMP TURBINES (CONTD)

Location of Shop \_\_\_\_\_

	<u>Yes</u>	<u>No</u>	<u>Not</u> <u>Applicable</u>	<u>Inspector</u>	<u>Date</u>
14. Conformed Data Sheets per reference B.1.n	—	—	—	—	—
15. Contractors Drawing Submittal per reference B.1.p	—	—	—	—	—
16. Other Applicable Data per reference B.1.q	—	—	—	—	—

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Shop Inspection Checklist - Example:  
Shop Inspection of Reactor Feed Pump Turbines  
Figure D(1)-3-5 Page 5 of 5 10/04/99

# Stearns-Roger

## INSPECTION

## EXPEDITING

Operator	P.O. No.	Item(s)	Date
Address	Vendor No.	S-R Representative	Pg. 1 of

Contacts w/Title: \_\_\_\_\_

Delivery Promise: \_\_\_\_\_

## NARRATIVE REPORT

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

*Inspection and Expediting Narrative Report*  
Figure D(1)-3-6 10/04/99

Inspection Punch List Report  
Figure D(1)-3-7 10/04/99

Approved: \_\_\_\_\_

Distribution: S-R Q.A. - Original + 3  
NPPD - 2  
B&R, CM & Eng. - 2  
Contractor - 2

Spec. Pg. No.: \_\_\_\_\_ ppg.: \_\_\_\_\_

**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

*Deviation Report*  
Figure D(1)-3-8 10/04/99

# DEVIATION REPORT LOG

LOCATION \_\_\_\_\_ SHEET NO. \_\_\_\_\_

**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

---

*Deviation Report Log*  
*Figure D(1)-3-9 10/04/99*

COOPER NUCLEAR STATION

CONTRACTOR: \_\_\_\_\_

CONCRETE PLACEMENT CHECKOUT SHEET

Pour Description \_\_\_\_\_ Date \_\_\_\_\_

Pour No. and Location \_\_\_\_\_ Contract No. \_\_\_\_\_

CONTRACTOR CHECKOUT			QUALITY ASSURANCE CHECKOUT		
Item	Representative	Date	Item	Representative	Date
Carp. Fore.			Forms & Blockouts		
Lab. Fore.			Cleanup		
Resteel			Resteel		
Struct. Steel			Struct. Steel & Bolts		
Mechanical			Piping		
Electrical			Elec. Installation		
Engineer			Line & Grade		
Supt.			Embedded Items		
			Anchor Bolts & Sleeves		
			Weather Protection		

STEARNS-ROGER CORP.  
QUALITY ASSURANCE \_\_\_\_\_

BURNS AND ROE, INC.  
CONSTRUCTION MANAGEMENT \_\_\_\_\_

(ALL ABOVE ITEMS MUST BE SIGNED OFF WHEN APPLICABLE)

CONCRETE PLANT NOTIFIED:	DATE _____	TIME _____
SITE MANAGEMENT NOTIFIED:	DATE _____	TIME _____
INSPECTOR NOTIFIED:	DATE _____	TIME _____
POUR STARTED:	DATE _____	TIME _____
POUR COMPLETED:	DATE _____	TIME _____
CLASS OF CONCRETE: _____		
CUBIC YARDS ESTIMATED: _____		
CUBIC YARDS PLACED: _____		
WEATHER CONDITIONS: _____		

DISTRIBUTION:

NPPD (2 copies)  
 BURNS & ROE (2 copies)  
 S-R, Q.A. (2 copies)  
 BATCH PLANT (1 copy)  
 BLOUNT BROS. (2 copies)

Nebraska Public Power District  
 COOPER NUCLEAR STATION  
 UPDATED SAFETY ANALYSIS REPORT (USAR)

Concrete Placement Checkout Sheet  
 Figure D(1)-3-10 10/04/99



SITE MANAGEMENT

COOPER NUCLEAR STATION

## ELECTRICAL INSTALLATION CHECK OFF LIST

Contract \_\_\_\_\_ Contractor \_\_\_\_\_

Description \_\_\_\_\_

System \_\_\_\_\_ Location \_\_\_\_\_

Manufacturer \_\_\_\_\_ P. O. \_\_\_\_\_

Item	Detail Requirements	Check Date	Signature	Date
1.	Identification			
	Nameplate			
	Tag Data			
	Mill Number			
2.	Routing			
	Tray			
	Conduit			
	Other			
3.	Termination			
	Identification Tags			
	Continuity			
4.	Grounding			
5.	Insulation			
	Per Drawing/Specification Test			
6.	Supports			
7.	Records			
	Contractor's Quality Control			

**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

*Electrical Installation Check-off List*  
Figure D(1)-3-12 10/04/99

# CONCRETE BATCH PLANT INSPECTION REPORT

DATE: \_\_\_\_\_ CLASS: \_\_\_\_\_ CONTRACT: \_\_\_\_\_

WEATHER: \_\_\_\_\_ INSPECTOR: \_\_\_\_\_

## MIX DESIGN

Cement: \_\_\_\_\_ no. \_\_\_\_\_ sks  
 Sand: (ssd) \_\_\_\_\_ no.  
 3/4" Rock: (ssd) \_\_\_\_\_ no.  
 1 1/2" Rock: (ssd) \_\_\_\_\_ no.  
 Admixture: \_\_\_\_\_ oz. \_\_\_\_\_  
 Admixture: \_\_\_\_\_ oz. \_\_\_\_\_  
 Design Water: \_\_\_\_\_ gal.

## WEIGHTS PER YD

		Agg.	Excess	Water	
Mo: _____ %	_____ lb.	_____ lb.	_____ lb.	_____ gal	
Mo: _____ %	_____ lb.	_____ lb.	_____ lb.	_____ gal	
Mo: _____ %	_____ lb.	_____ lb.	_____ lb.	_____ gal	

\_\_\_\_\_ gal

Total Water: \_\_\_\_\_ gal/yd

[illegible]

**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

Concrete Batch Plant Inspection Report  
Figure D(1)-3-13 10/04/99

## LAB. WORK SHEET AND FILE

TIME: \_\_\_\_\_

DATE: \_\_\_\_\_

SAMPLE LOCATION: \_\_\_\_\_

MATERIAL: SAND

WET WT. + TARE \_\_\_\_\_

DRY WT. + TARE \_\_\_\_\_

DRY WT. + TARE \_\_\_\_\_

TARE \_\_\_\_\_

$$\frac{\text{WET WT. + TARE} - \text{DRY WT. + TARE}}{\text{DRY WT. + TARE}} \times 100 = \frac{\text{WET WT. + TARE} - \text{DRY WT. + TARE}}{\text{DRY WT. + TARE}} \%$$

Moisture In Sand

TIME: \_\_\_\_\_

DATE: \_\_\_\_\_

SAMPLE LOCATION: \_\_\_\_\_

MATERIAL: 3/4" ROCK

WET WT. + TARE \_\_\_\_\_

DRY WT. + TARE \_\_\_\_\_

DRY WT. + TARE \_\_\_\_\_

TARE \_\_\_\_\_

$$\frac{\text{WET WT. + TARE} - \text{DRY WT. + TARE}}{\text{DRY WT. + TARE}} \times 100 = \frac{\text{WET WT. + TARE} - \text{DRY WT. + TARE}}{\text{DRY WT. + TARE}} \%$$

Moisture In Rock

TIME: \_\_\_\_\_

DATE: \_\_\_\_\_

SAMPLE LOCATION: \_\_\_\_\_

MATERIAL: 1 1/2" ROCK

WET WT. + TARE \_\_\_\_\_

DRY WT. + TARE \_\_\_\_\_

DRY WT. + TARE \_\_\_\_\_

TARE \_\_\_\_\_

$$\frac{\text{WET WT. + TARE} - \text{DRY WT. + TARE}}{\text{DRY WT. + TARE}} \times 100 = \frac{\text{WET WT. + TARE} - \text{DRY WT. + TARE}}{\text{DRY WT. + TARE}} \%$$

Moisture in Rock

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Lab Work Sheet and File  
Figure D(1)-3-14 10/04/99

## NEBRASKA PUBLIC POWER DISTRICT

Cooper Nuclear Station

Project Laboratory

Lab No.: \_\_\_\_\_

## LAB DATA

Material: \_\_\_\_\_ Date Sampled: \_\_\_\_\_

Mark: \_\_\_\_\_ Time Sampled: \_\_\_\_\_

Sampled by: \_\_\_\_\_

Sample Source: \_\_\_\_\_

Sieve	Weight Retained	% Ret.	Acc. % Ret.	Specs
2"				
1½"				
1"				
¾"				
⅜"				
# 4				
# 8				
# 16				
# 30				
# 50				
# 100				
# 200				
Pan				
Total				

Initial Wet Wt: \_\_\_\_\_

Initial Dry Wt: \_\_\_\_\_

Diff: \_\_\_\_\_

Moisture: \_\_\_\_\_ %

Initial Dry  
Sample Wt.: \_\_\_\_\_Dry Wt. After  
( # 200) Wash: \_\_\_\_\_

Diff: \_\_\_\_\_

Loss: \_\_\_\_\_ %

Remarks: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date: \_\_\_\_\_

Lab. Technician Tested by: \_\_\_\_\_

Lab. Technician Calc. by: \_\_\_\_\_

Lab. Technician Checked by: \_\_\_\_\_

Lab. Manager Approved by: \_\_\_\_\_

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Lab Data  
Figure D(1)-3-15 10/04/99

REVIEWED BY: \_\_\_\_\_

CNS-L1

NEBRASKA PUBLIC POWER DISTRICT  
Cooper Nuclear Station  
Project Laboratory

Lab No.: \_\_\_\_\_

## LAB FIELD DATA

Class: \_\_\_\_\_ Material: \_\_\_\_\_

Mark: \_\_\_\_\_ Date Sampled: \_\_\_\_\_ By: \_\_\_\_\_

Ticket No.: \_\_\_\_\_ Contract: \_\_\_\_\_ Time: \_\_\_\_\_

Sample Source: \_\_\_\_\_

Spec. Strength: \_\_\_\_\_ Slump: \_\_\_\_\_ inch

Water Added Job: \_\_\_\_\_ gals. Wet Wt: \_\_\_\_\_ pcf

Batch Volume: \_\_\_\_\_ Air: \_\_\_\_\_ %

Remarks: \_\_\_\_\_

Test Date	Age (Days)	Total Load (#)	Compressive Strength (psi)	Tested by:

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)Lab Field Data  
Figure D(1)-3-17 10/04/99







Sheet No. \_\_\_\_\_  
Issue Date \_\_\_\_\_

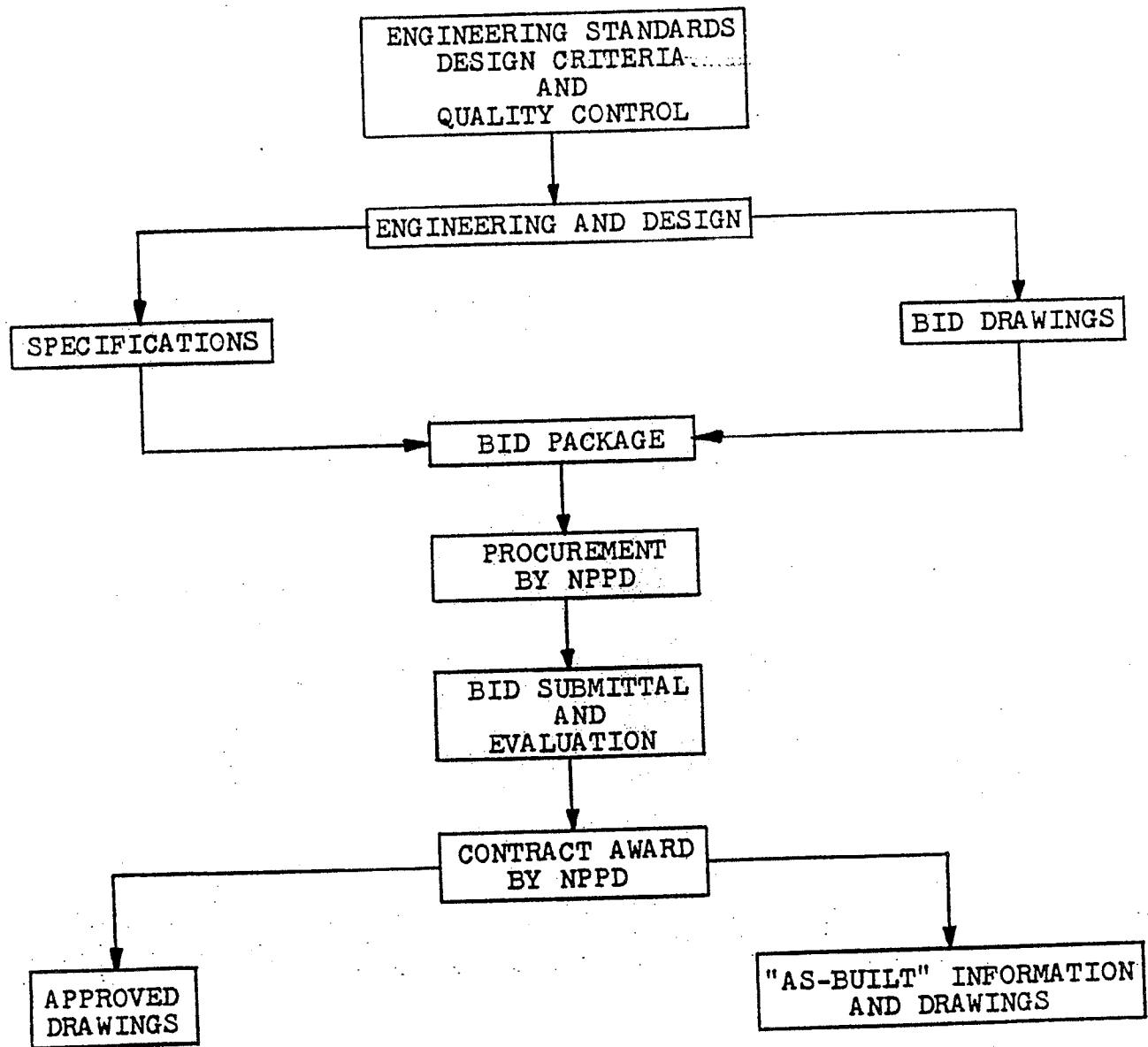
Contract No. \_\_\_\_\_ Description \_\_\_\_\_ Contractor \_\_\_\_\_  
P. O. No. \_\_\_\_\_ Prepared By \_\_\_\_\_ Supplier \_\_\_\_\_

[illegible]

1. Cert of Compliance (Mfg. and testing)
2. Cert of Compliance (Materials)
3. Dielectric Test Reports
4. Continuity Test Reports
5. Radiation Service Certifications
6. Standard Shop Test Reports
7. Functional Check Reports
8. Calibration Data
9. Instruction Books
10. Other requirements (list each and assign sequential numbers)

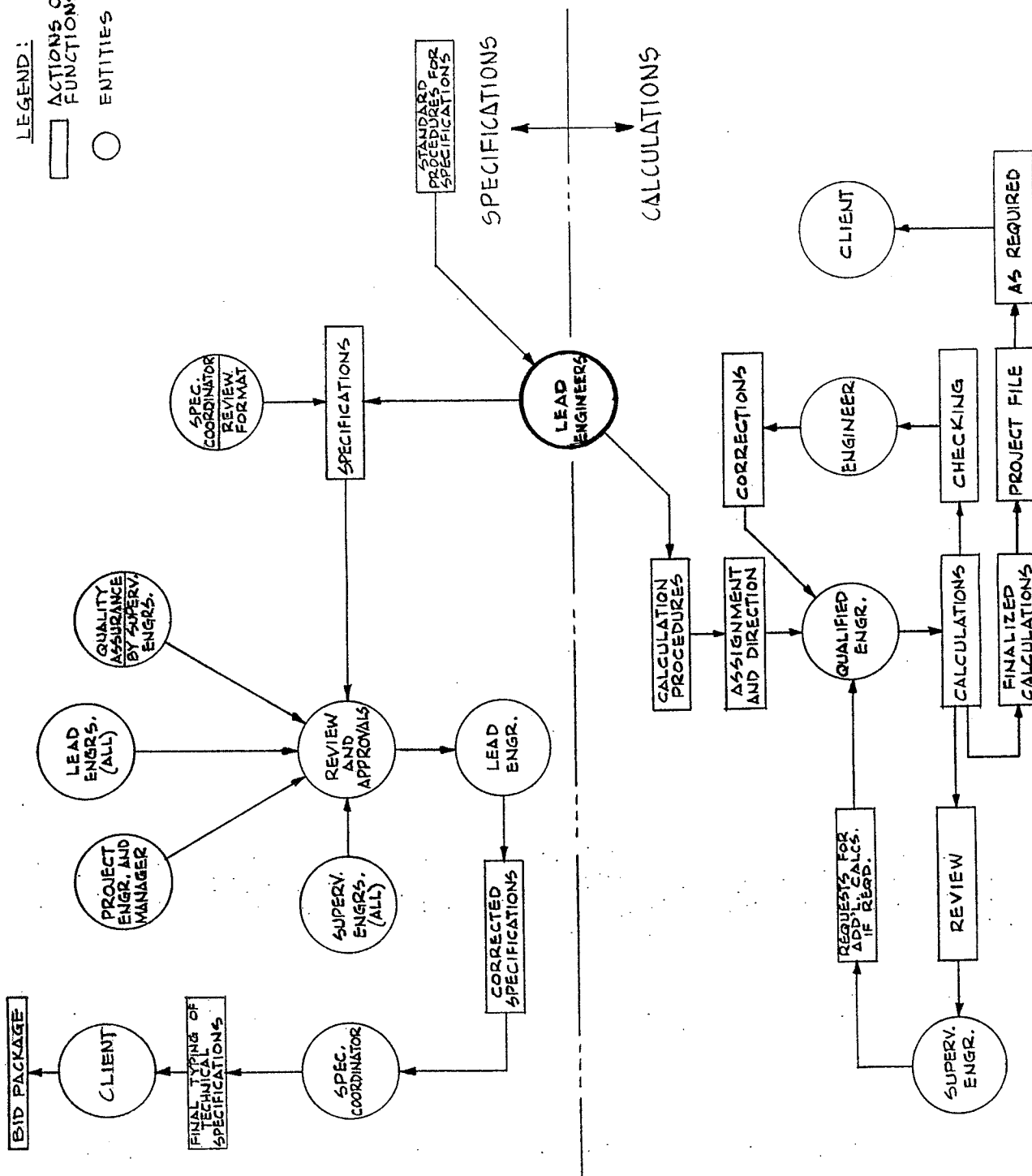
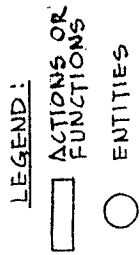
Documentation Requirements (Electrical)  
Figure D(1)-3-20 10/04/99





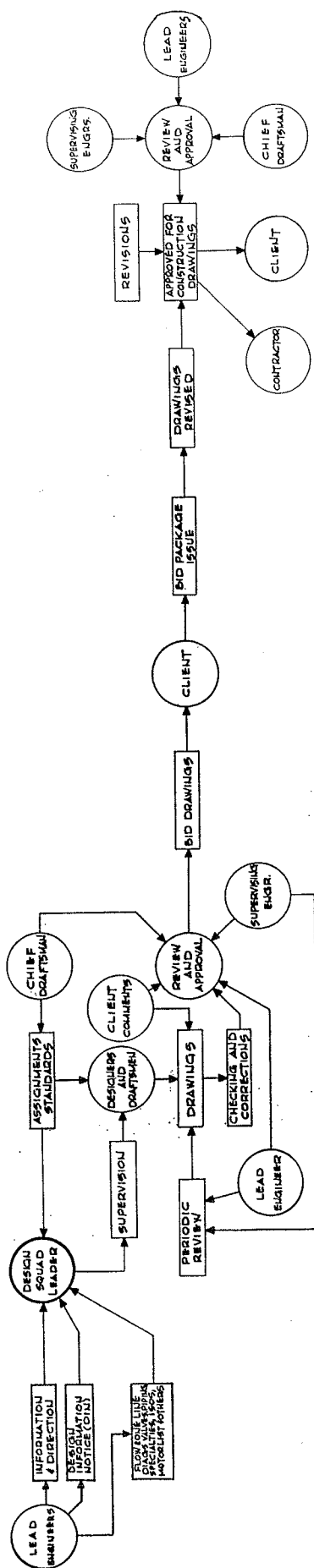
Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Engineering and Design Flow Chart  
Figure D(1)-4-2 10/04/99



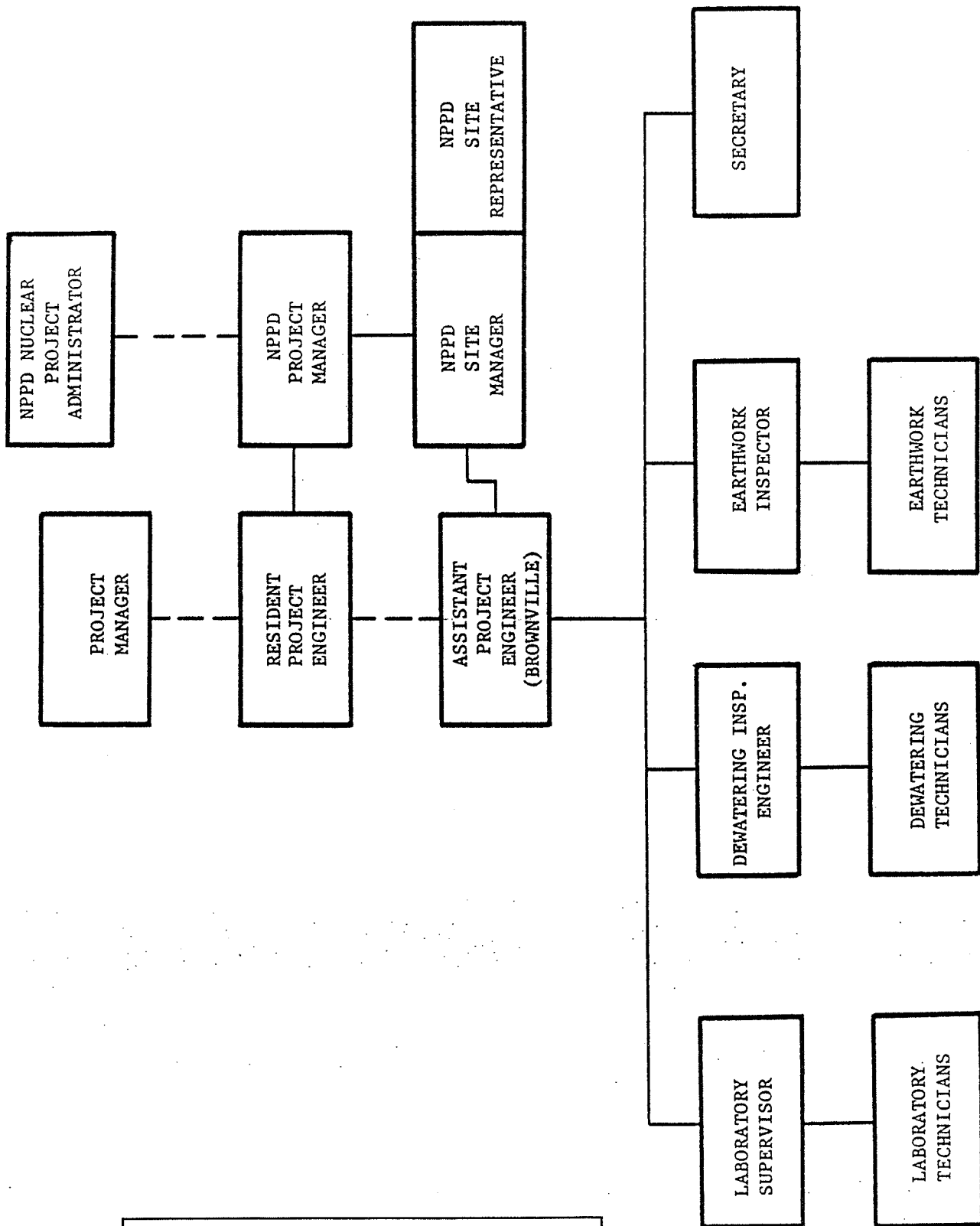
Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Specifications and Calculations Flow Chart  
Figure D(1)-4-3 10/04/99



*Drawings Flow Chart*  
Figure D(1)-4-4 10/04/99

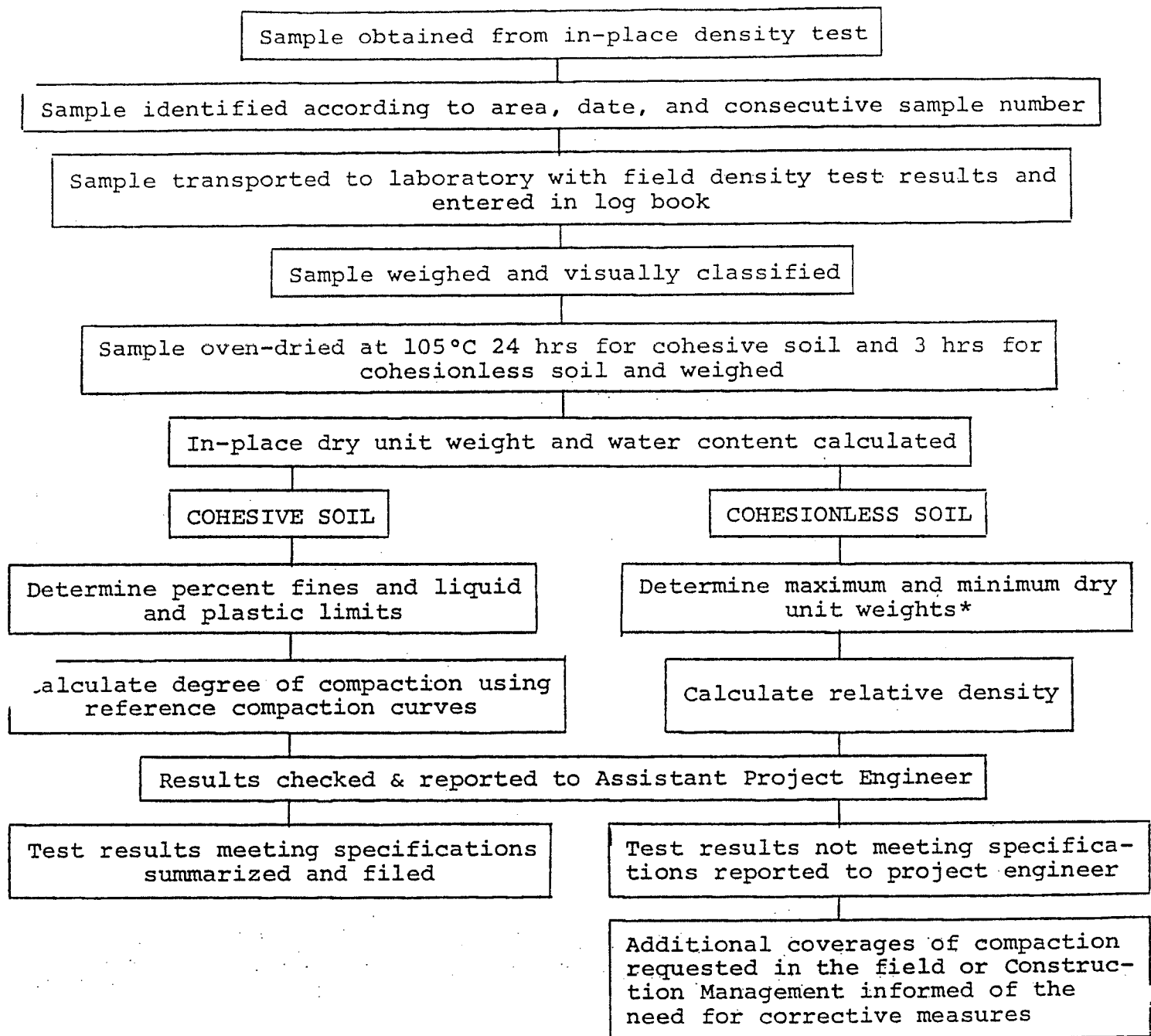




**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

*Organization Chart - Cooper Nuclear Station  
Woodward-Moorhouse & Associates Inc.  
Quality Assurance Program  
Figure D(1)-5-1 10/04/99*

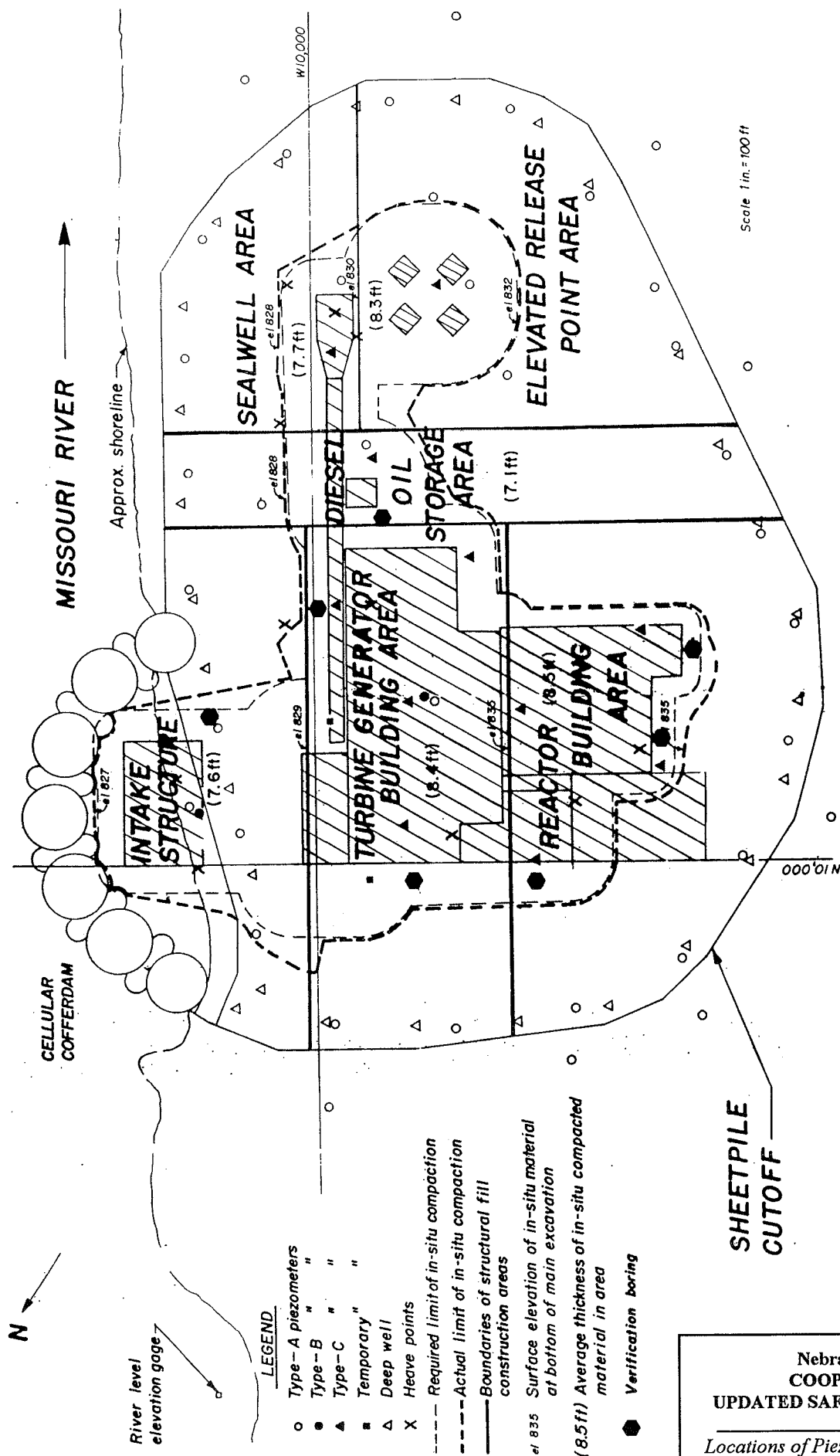




\*Vibratory table used for the determination of the maximum dry unit weight; every tenth determination was repeated for reproducibility check; and approx every tenth sample used to determine the maximum dry unit weight according to the "Basic" method.

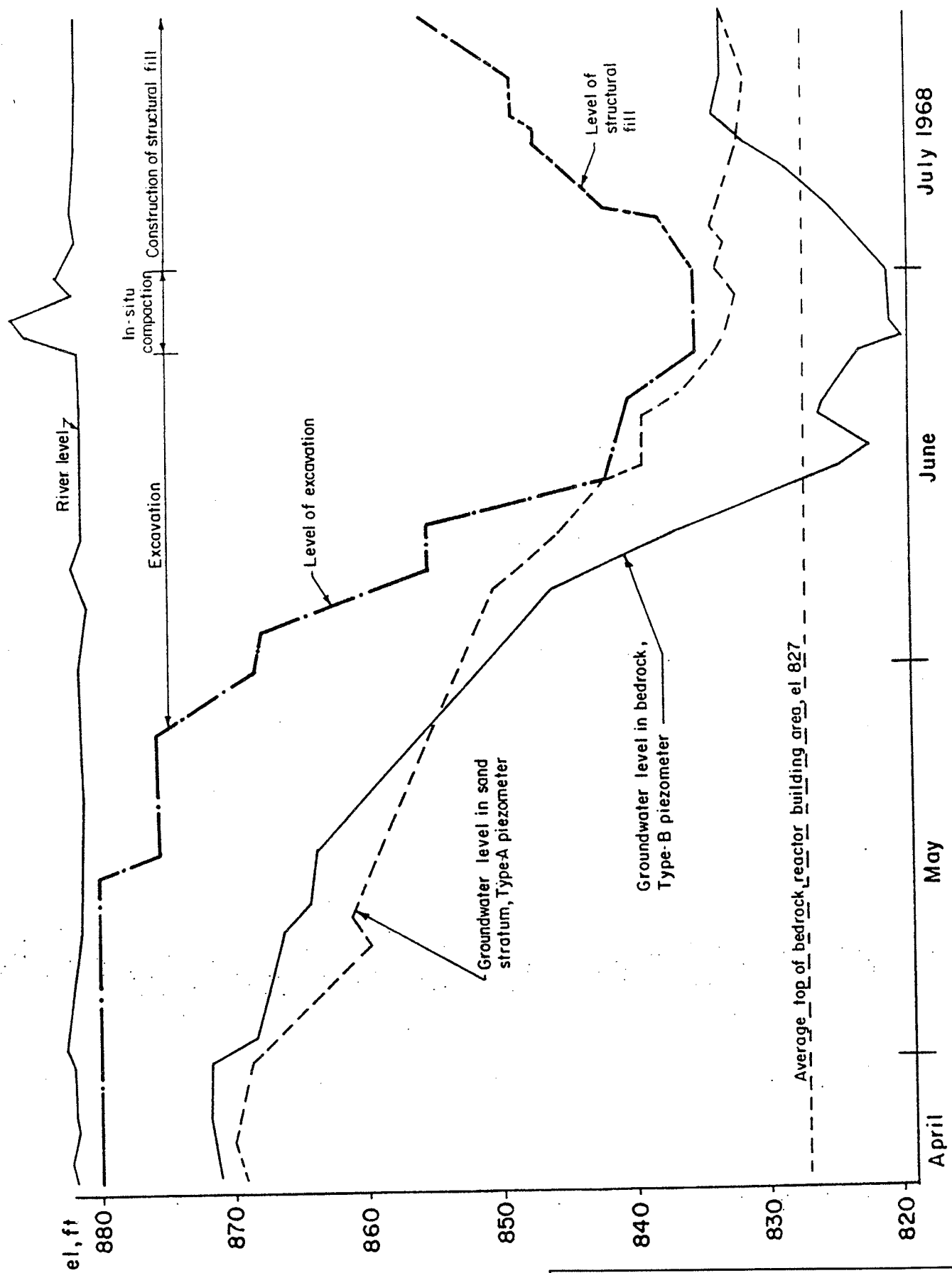
Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

*Flow Diagram of Laboratory Phase of Quality Control  
Testing of Structural and General Fills  
Figure D(1)-5-2 10/04/99*



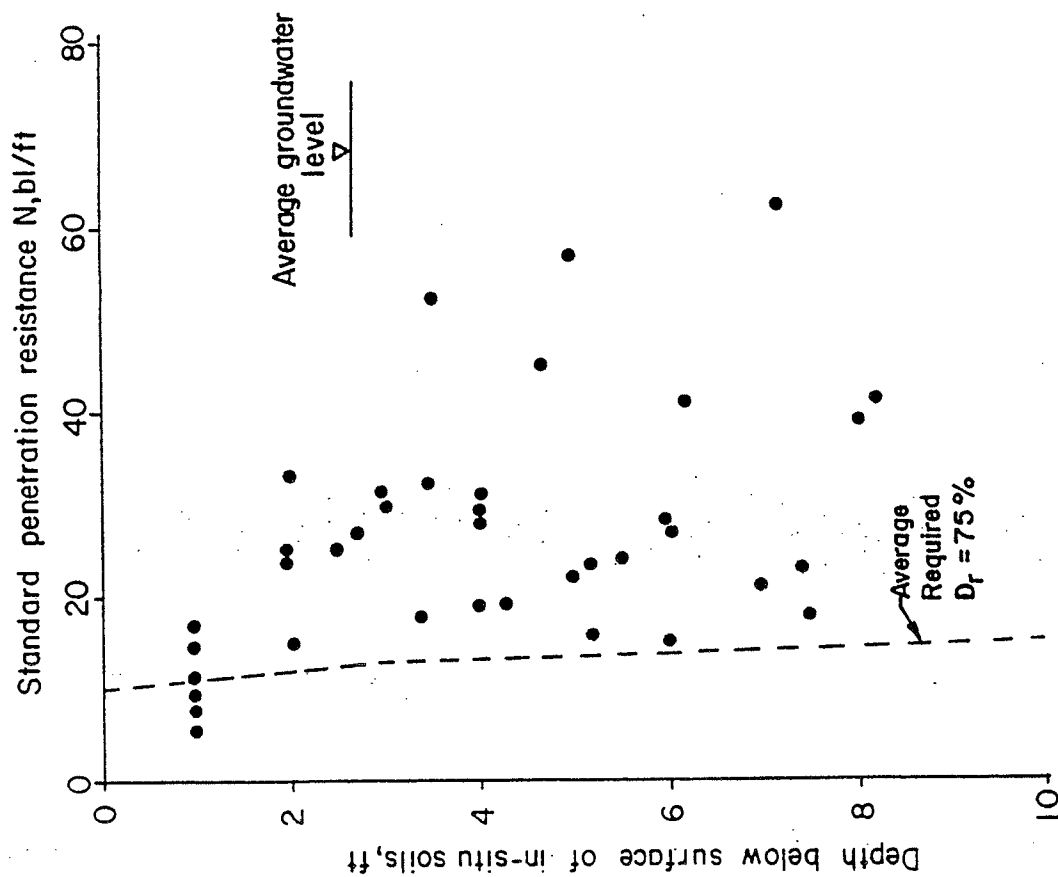
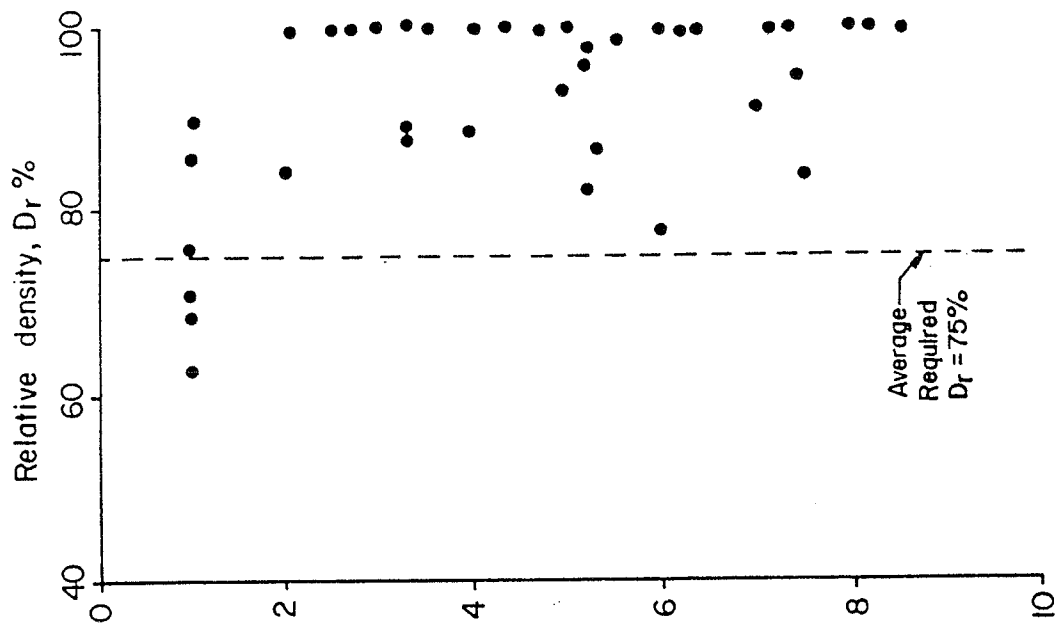
**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

*Locations of Piezometers, Heave Points, Deep Wells,  
Verification Borings, and In-Situ Compaction and  
Structural Fill Construction Areas  
Figure D(1)-5-3 10/04/99*



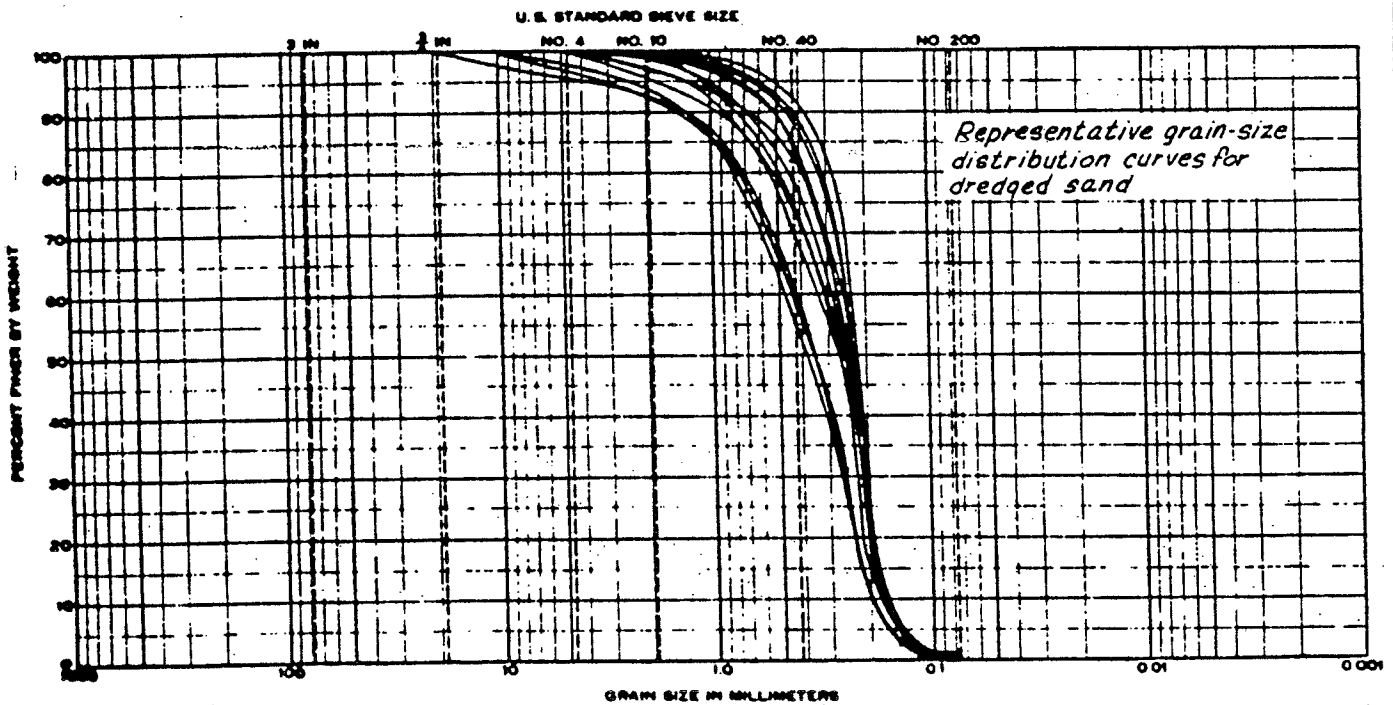
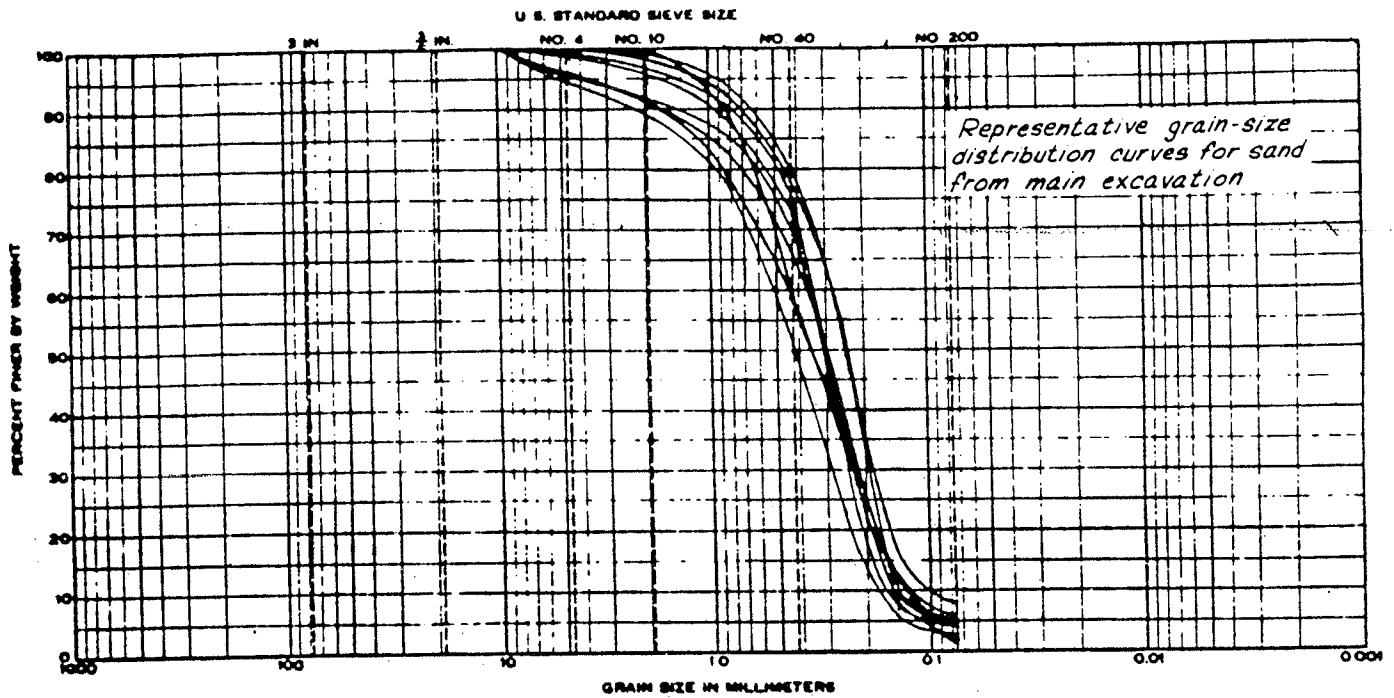
Nebraska Public Power District  
 COOPER NUCLEAR STATION  
 UPDATED SAFETY ANALYSIS REPORT (USAR)

*Results of Observations of Excavation and  
 Groundwater Levels in Reactor Building Area  
 Figure D(1)-5-4 10/04/99*



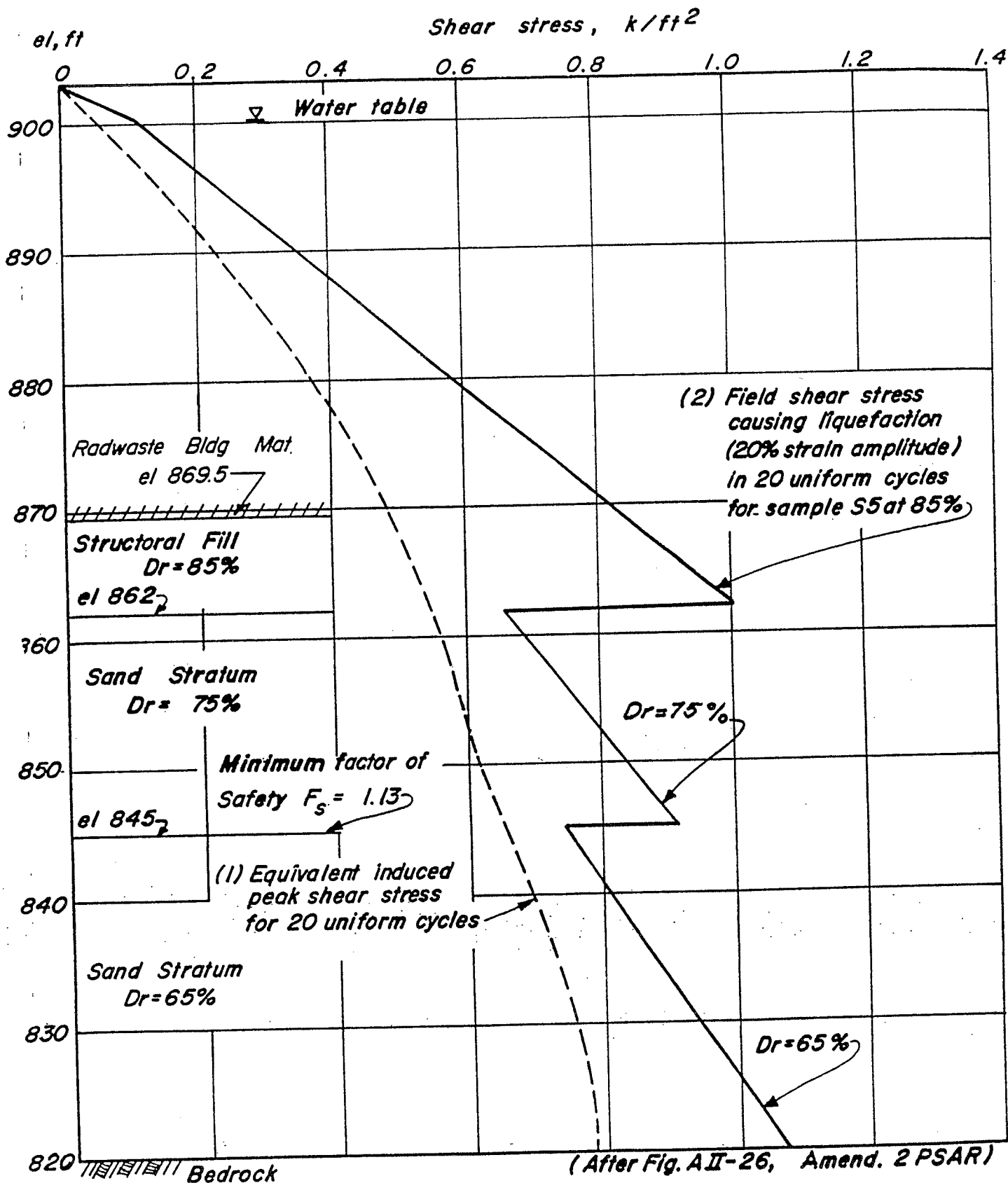
Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Results of Standard Penetration Tests and Calculated  
Relative Densities of In-Situ Compacted Material  
Figure D(1)-5-5 10/04/99



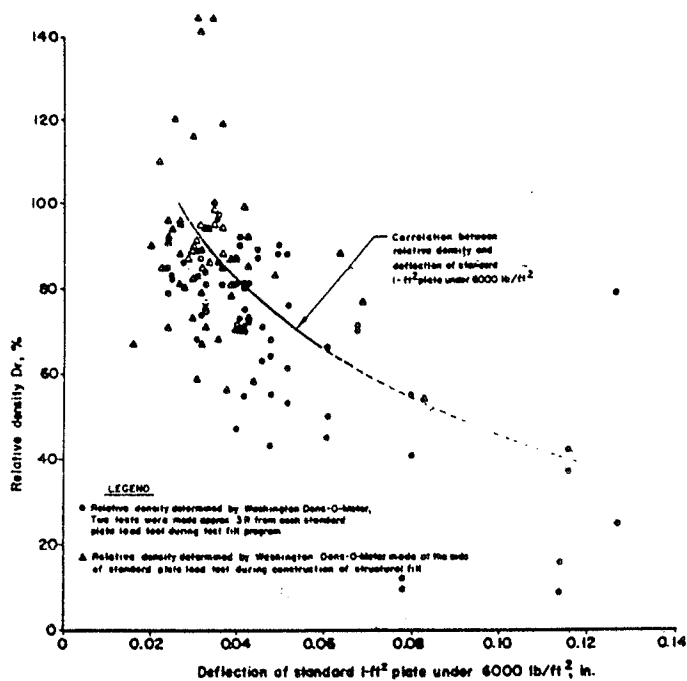
Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Representative Grain-Size Distribution Curves for  
Sand from Main Excavation and Dredged Sand  
Figure D(1)-5-6 10/04/99

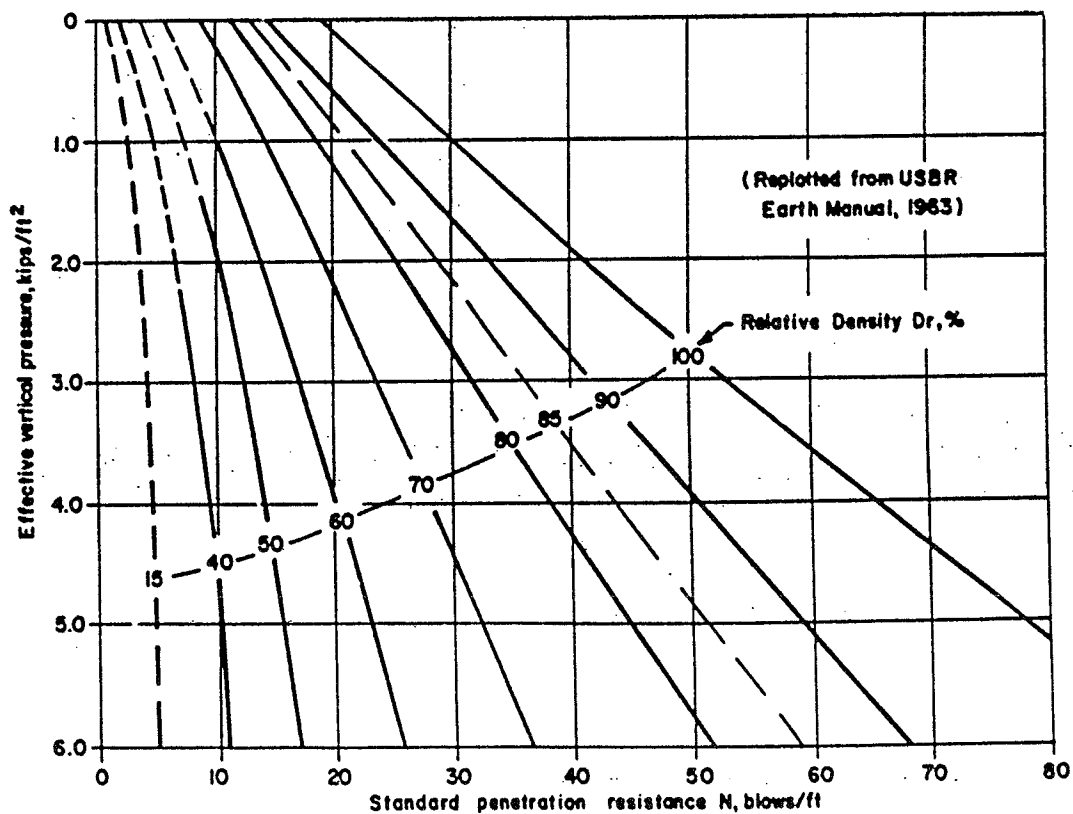


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Liquefaction Potential for the Existing Structural Fill  
and Sand Stratum Beneath the Radwaste Bldg. Mat  
Figure D(1)-5-7 10/04/99



a. CORRELATION BETWEEN RELATIVE DENSITY AND DEFLECTION OF STANDARD 1-FT<sup>2</sup> PLATE UNDER 6000 LB/FT<sup>2</sup>



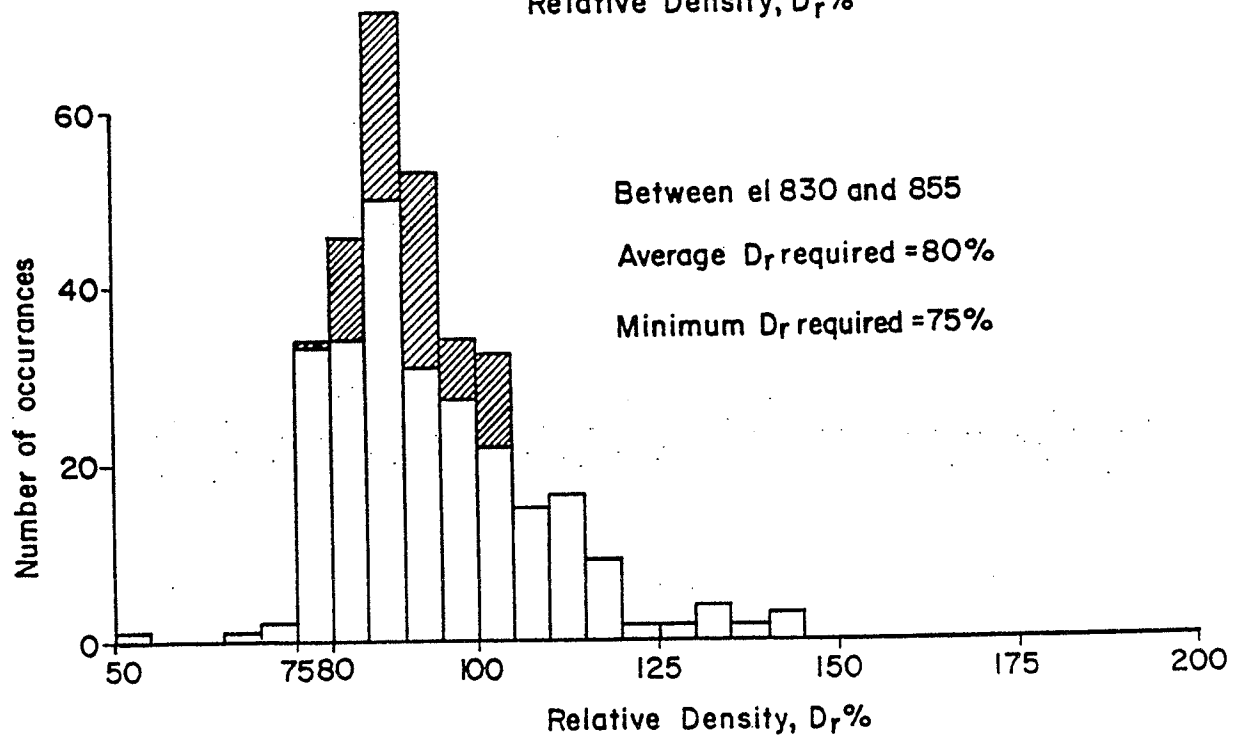
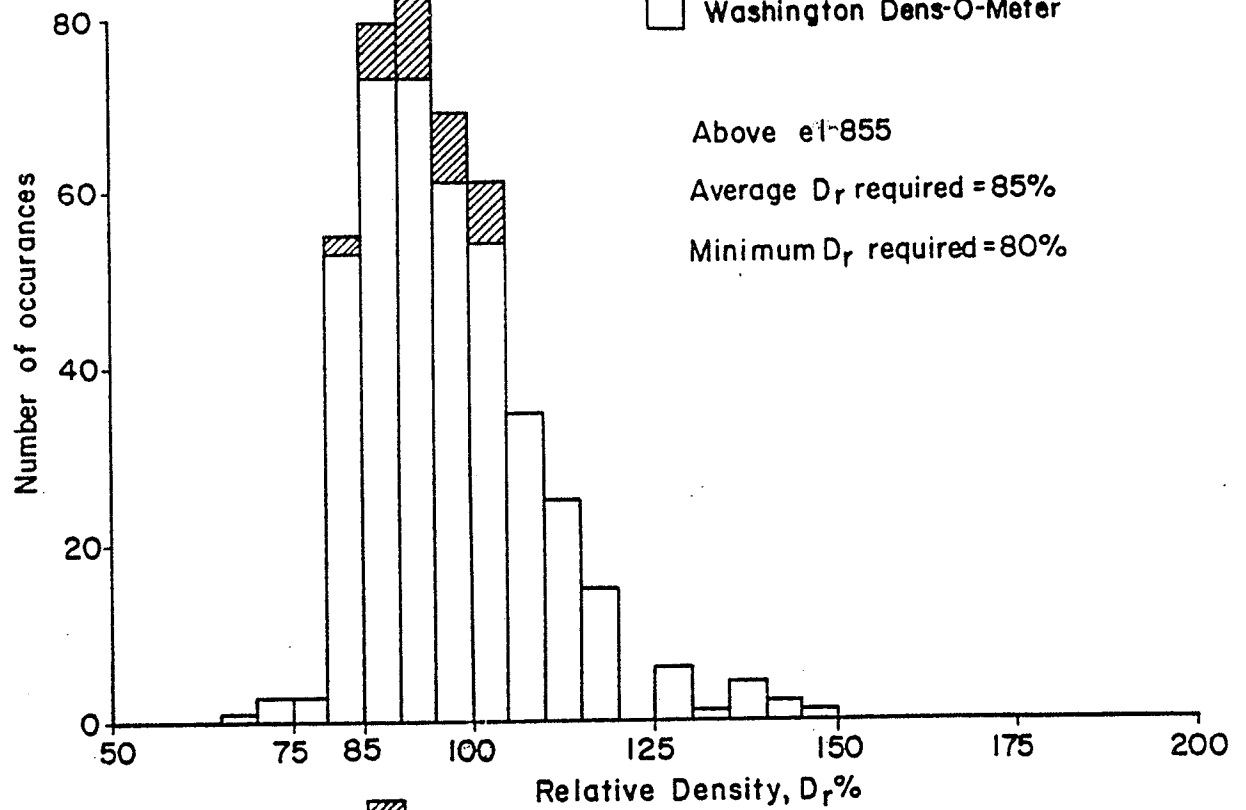
b. RELATIONSHIP BETWEEN STANDARD PENETRATION AND RELATIVE DENSITY FOR SAND

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Structural Fill Density Correlations  
Figure D(1)-5-8 10/04/99

# LEGEND

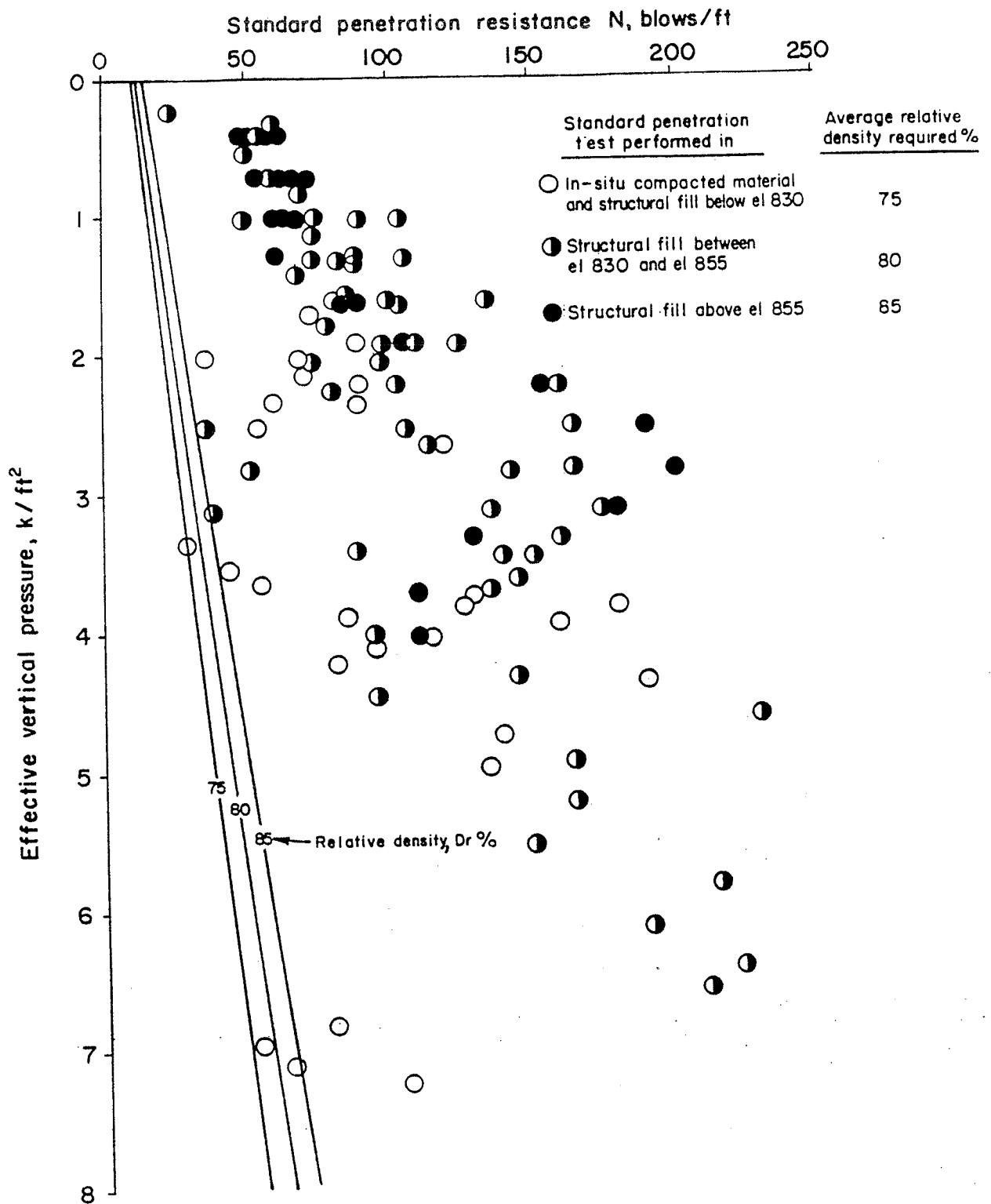
- Standard plate load test
- Washington Dens-O-Meter



Nebraska Public Power District  
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UPDATED SAFETY ANALYSIS REPORT (USAR)

*Histograms of Relative Density Values  
Obtained in Structural Fill  
Figure D(1)-5-9 10/04/99*





Nebraska Public Power District  
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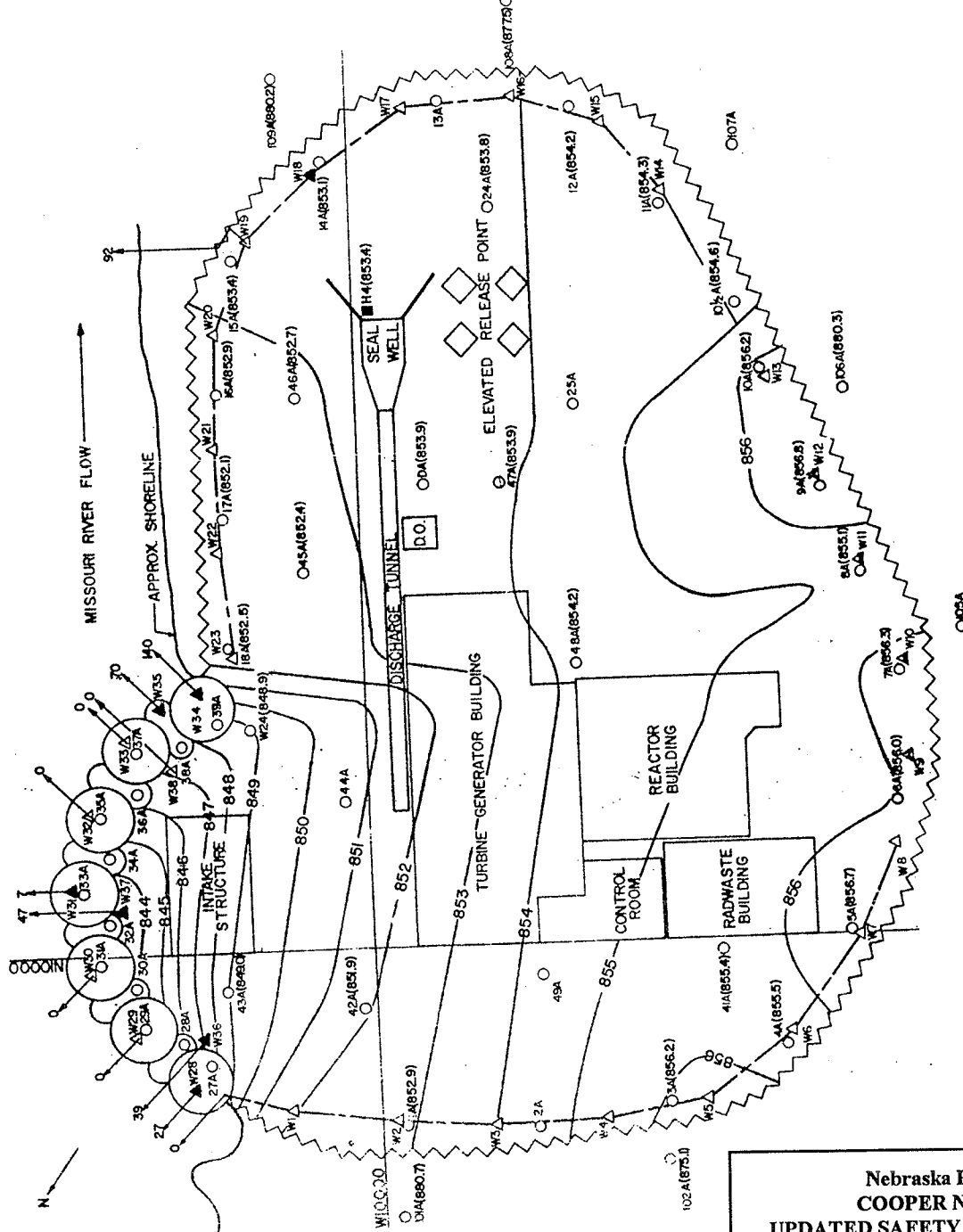
Results of Standard Penetration Tests in Structural Fill  
Figure D(1)-5-10 10/04/99

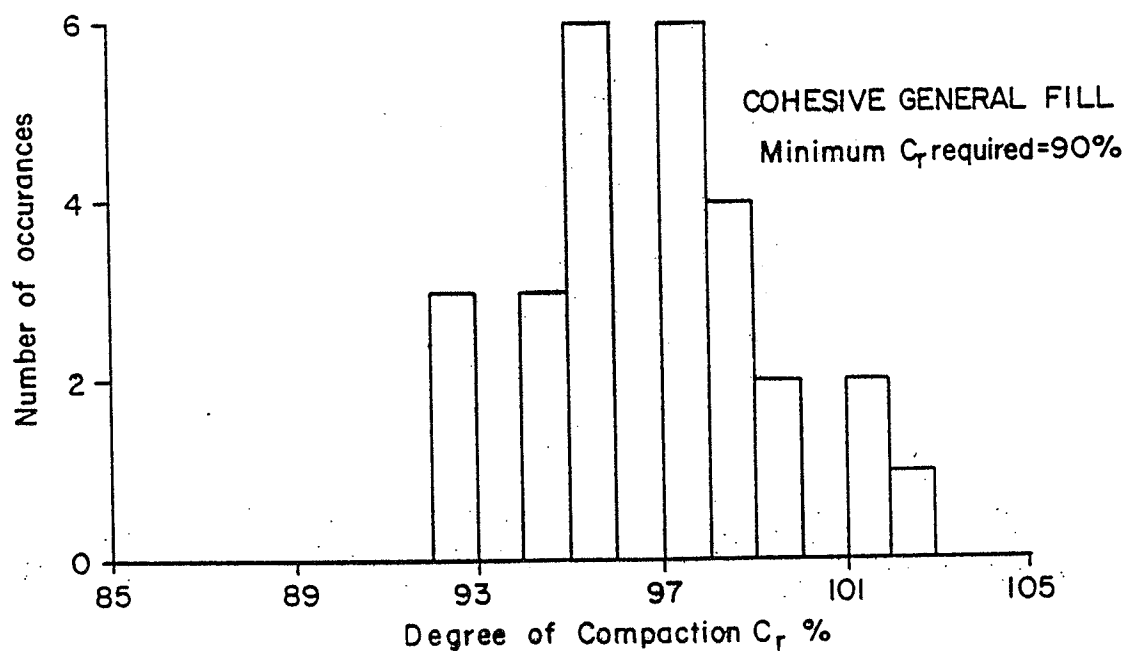
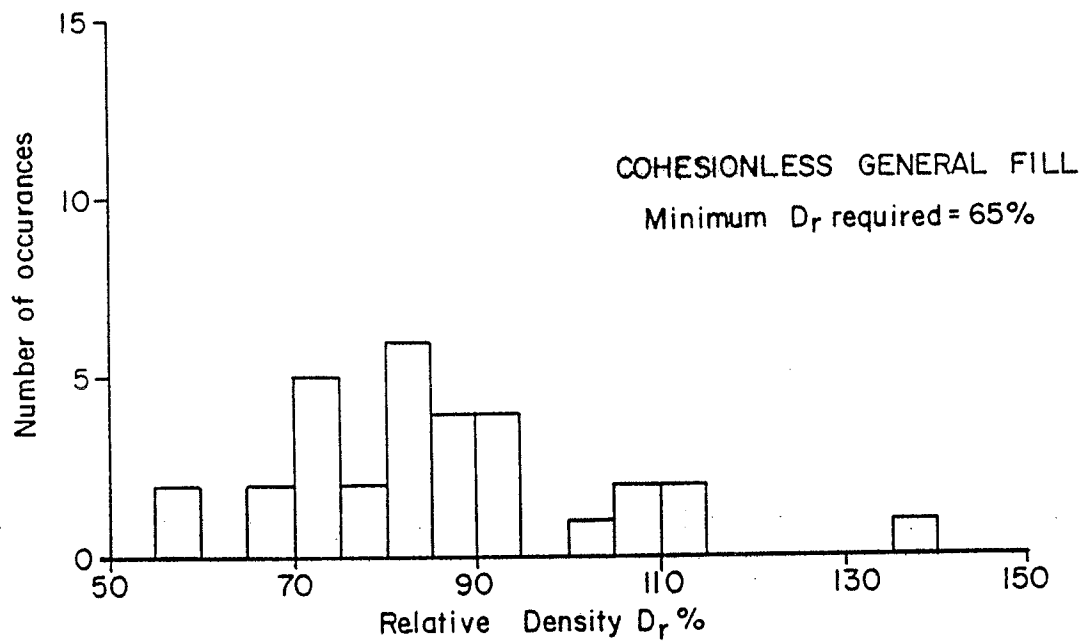
# LEGEND

- ▲ Deep well backfilled and covered with fill
- Type A piezometer
- Temporary piezometer
- ▲ Deep well operating
- ▲ Deep well not operating
- ▲ Shearpile cutoff wall
- Collector pipe
- 70 Discharge flow gal/min
- 845— Groundwater contour elevation

- Notes:
- (1) Contours were interpreted on the basis of water level elevations measured within the shearpile cutoff wall.
  - (2) Deep wells W34 and W35 have two pumps operating.
  - (3) Deep wells W18, W28, W31, W36 and W37 have one pump operating.
  - (4) River elevation 881.1 at 0600 hrs.
  - (5) Total discharge rate from cellular cofferdam and plant bowl 422 gal/min.
  - (6) Deep well casing W8 is capped and covered with fill.
  - (7) Groundwater level measurements could not be made in piezometers 2A, 13A, 25A, 33A, 39A, 44A, 49A, 105A and 107A because of damage to the risers.
  - (8) Number adjacent to deep well symbols is deep well number.
  - (9) Numbers adjacent to piezometer symbols are piezometer numbers and groundwater levels, respectively.

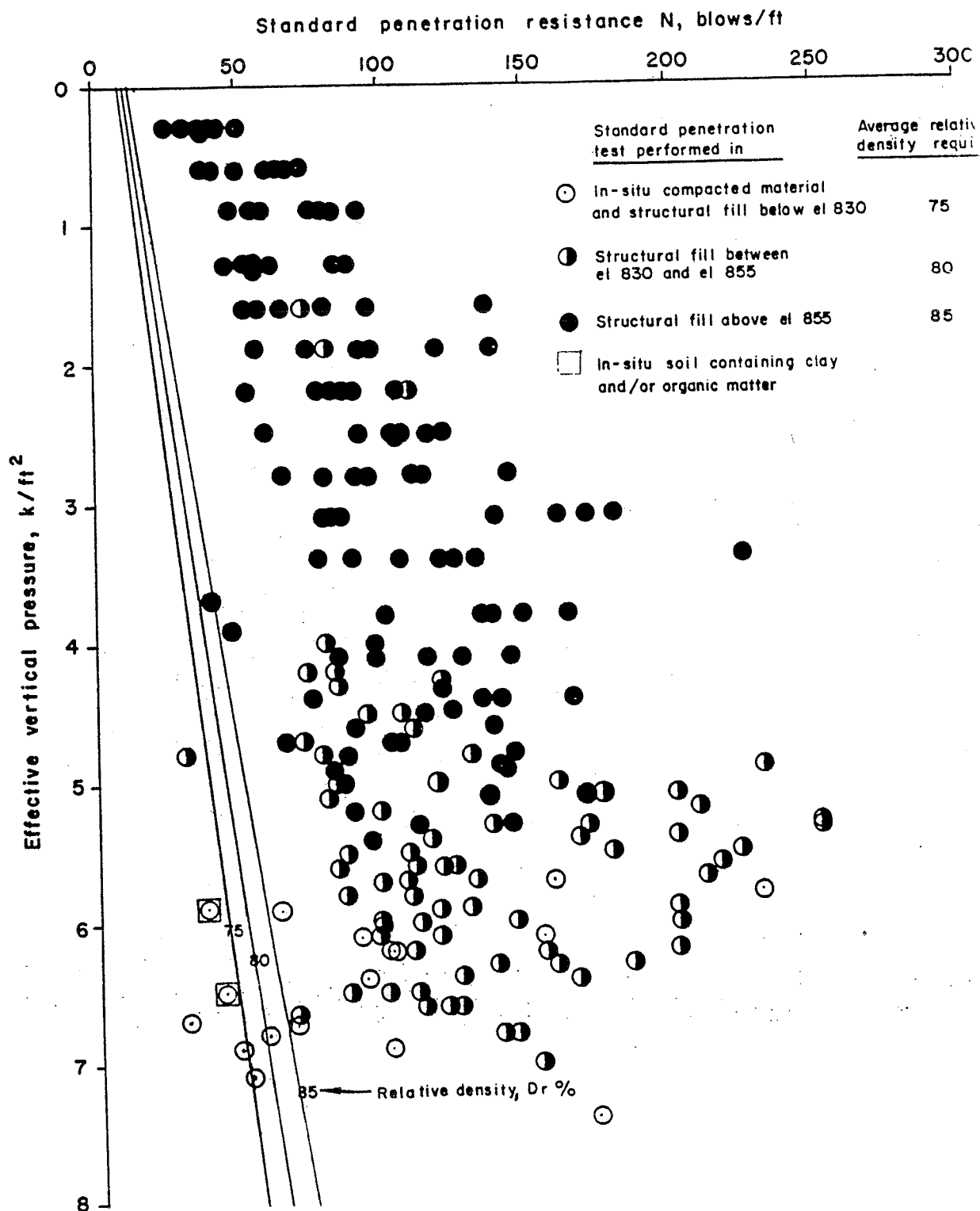
Scale 1 in = 100 ft.  
Contour interval = 1 ft.





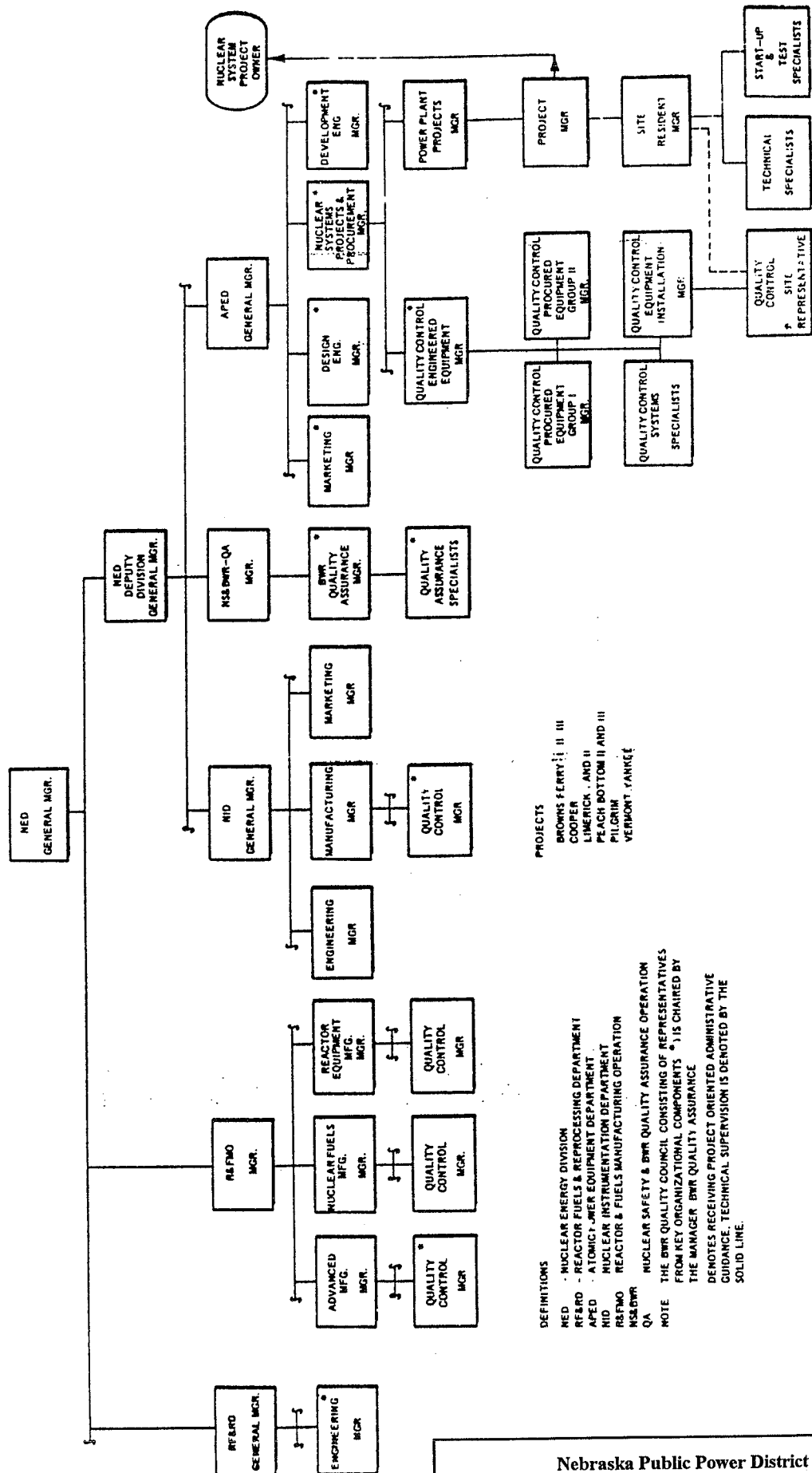
Nebraska Public Power District  
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*Histograms of Relative Density and Degree of  
Compaction Values Obtained in General Fill  
Figure D(1)-5-12 10/04/99*



**Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)**

*Results of Standard Penetration Tests  
in Verification Borings  
Figure D(1)-5-13 10/04/99*



PROJECTS  
BROWNS FERRY I, II, III  
COOPER, AND II  
LIMERICK, AND II  
PEACH BOTTOM II AND III  
PILGRIM  
VERMONT (RANGE)

#### DEFINITIONS

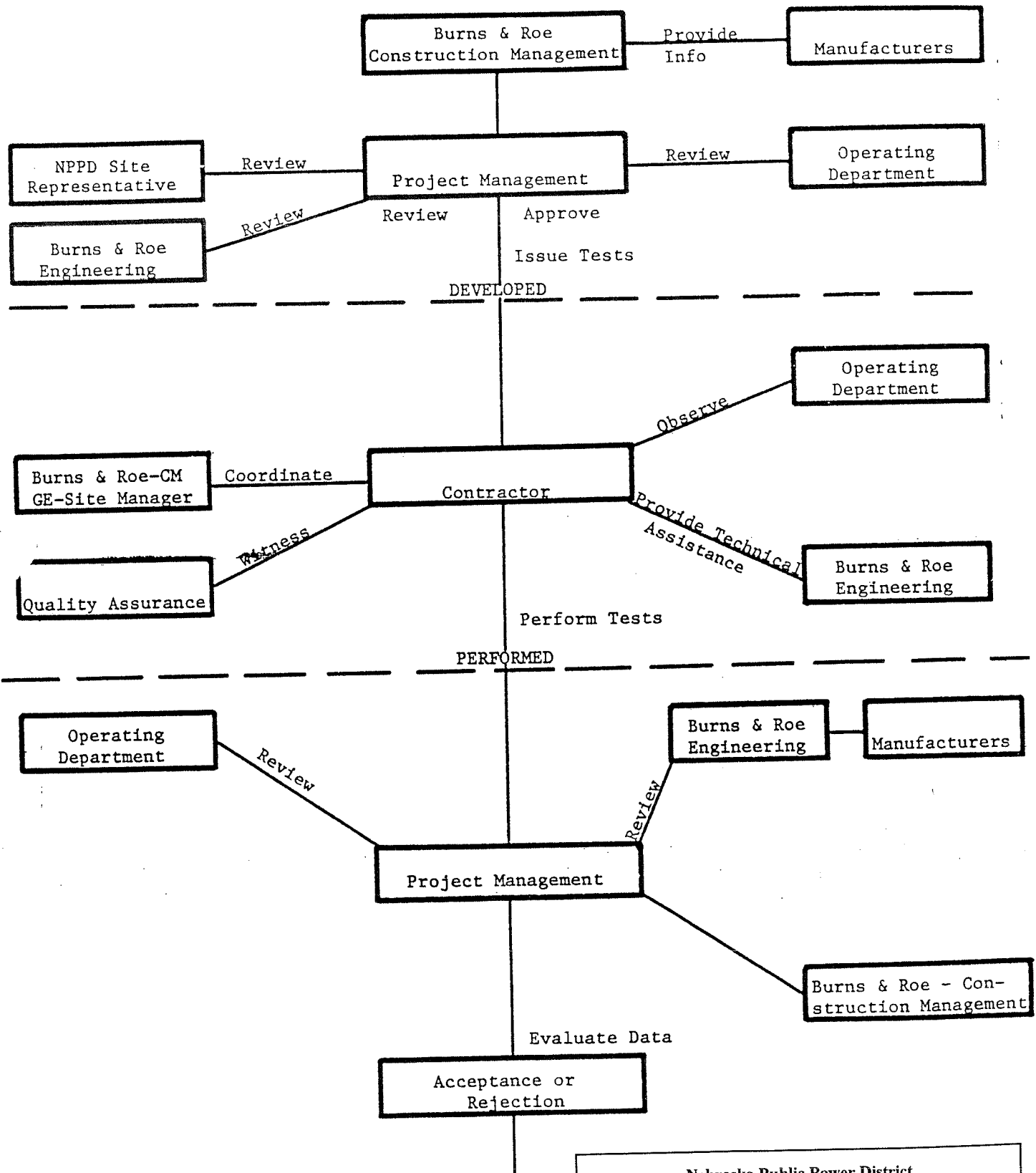
NED - NUCLEAR ENERGY DIVISION  
RFRD - REACTOR FUELS & REPROCESSING DEPARTMENT  
APED - ATOMIC POWER EQUIPMENT DEPARTMENT  
NID - NUCLEAR INSTRUMENTATION DEPARTMENT  
R4FMO - REACTOR & FUELS MANUFACTURING OPERATION  
NSBQW - NUCLEAR SAFETY & BWR QUALITY ASSURANCE OPERATION

NOTE: THE BWR QUALITY COUNCIL, CONSISTING OF REPRESENTATIVES FROM KEY ORGANIZATIONAL COMPONENTS, IS CHAIRED BY THE MANAGER, BWR QUALITY ASSURANCE. DENOTES RECEIVING PROJECT ORIENTED ADMINISTRATIVE GUIDANCE. TECHNICAL SUPERVISION IS DENOTED BY THE SOLID LINE.

### Nebraska Public Power District COOPER NUCLEAR STATION UPDATED SAFETY ANALYSIS REPORT (USAR)

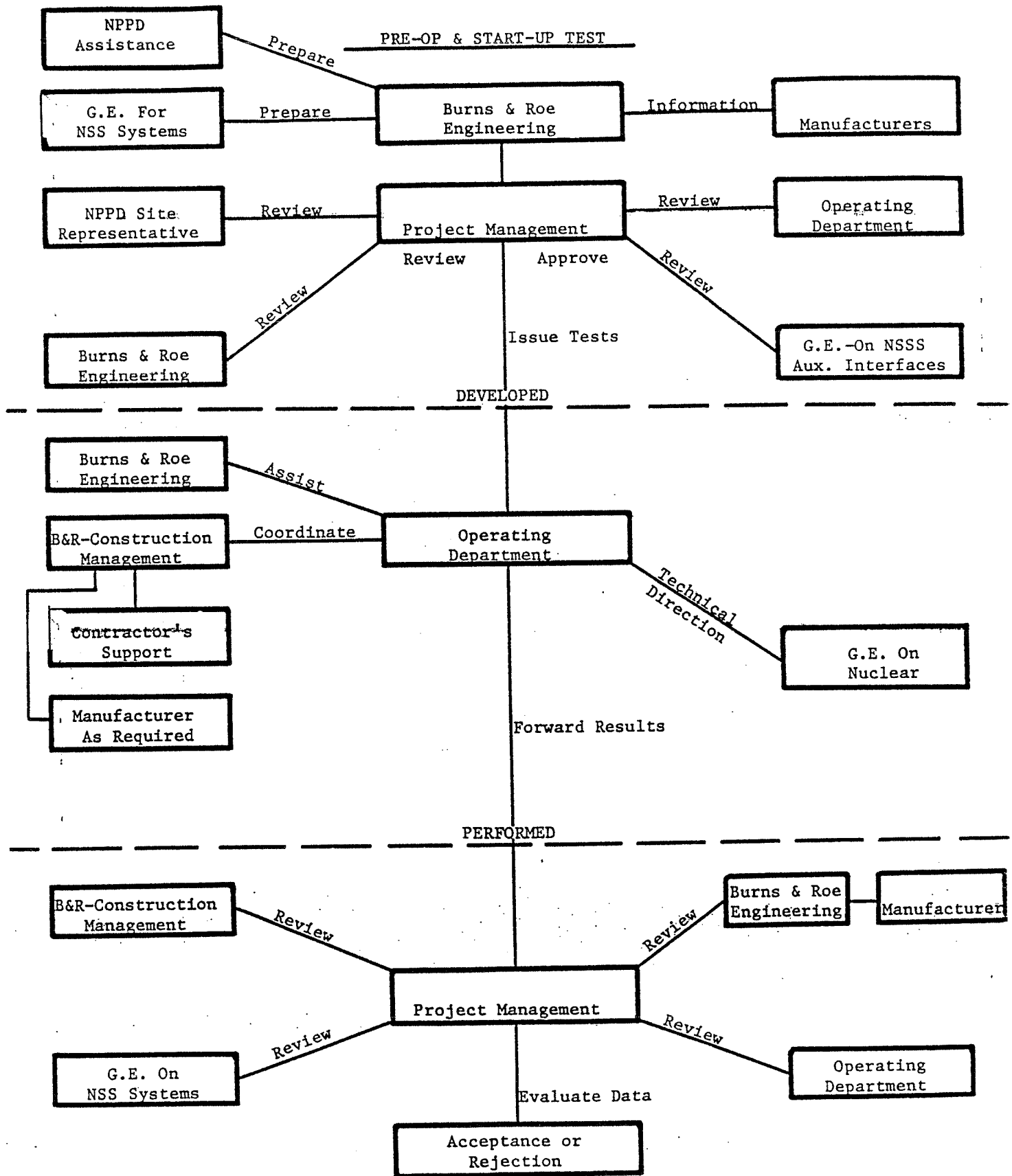
Quality System Organizational Structure  
Figure D(1)-6-1 10/04/99

CONSTRUCTION TEST



Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Construction Test  
Figure D(1)-7-1 10/04/99



Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Pre-Op and Start-Up Test  
Figure D(1)-7-2 10/04/99

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

PRE-OPERATIONAL TEST NO.

TITLE: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_

REVISION: \_\_\_\_\_ DATE: \_\_\_\_\_

PROCEDURE APPROVAL:

AUTHORIZATION TO PERFORM:

_____	Date	Plant Test and Operations Manager, Burns and Roe (BOP)	_____	Date
_____	Date	(or) Operations Manager, General Electric (NSSS)	_____	Date
_____	Date	Station Superintendent, Nebraska Public Power District	_____	Date

CERTIFICATION OF TEST COMPLETION

This test has been conducted in accordance with this procedure.

Test Engineer	Date	Test Engineer	Date	Pre-Op. Test Engr.	Date
Burns and Roe (BOP)		General Electric (NSSS)		N.P.P.D.	

CERTIFICATION OF TEST RESULTS

This test has been satisfactorily completed and the system and equipment have met the requirements contained herein.

Exceptions:

Engineering (Site)	Date	Generation Engrg.	Date	Station Superintendent	Date
Burns and Roe - BOP		N.P.P.D. (Site)		Cooper Nuclear Station	

Operations Mgr. \_\_\_\_\_ Date \_\_\_\_\_  
General Electric - NSSS

Nebraska Public Power District  
COOPER NUCLEAR STATION  
UPDATED SAFETY ANALYSIS REPORT (USAR)

Pre-Operational Test Procedure Cover Sheet  
Figure D(1)-7-3 10/04/99