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4410-85-L-0101
Document ID 0242A

April 26, 1985

TMI Program Office
Attn: Dr. B. J. Snyder
Program Director
US Nuclear Regulatory Commission
Washington, DC 20555

Dear Dr. Snyder:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Plenum Removal Safety Evaluation Report Response to NRC Questions

The attached responds to the comments on the subject Safety Evaluation Report (SER) forwarded by your letter to Mr. F. R. Standerfer, dated April 5, 1985. The Plenum Removal SER was previously submitted via GPU Nuclear letter 4410-85-L-0025 dated January 25, 1985.

Sincerely,

F R Standerfer

F. R. Standerfer
Vice President/Director, TMI-2

FRS/RBS/eml

Attachment

cc: Deputy Program Director - TMI Program Office, Dr. W. D. Travers

D009
1/1

NRC STAFF QUESTIONS ON PLENUM LIFT AND TRANSFER

QUESTION 1

At the meeting with NRC staff held on March 22, 1985, GPU discussed the results of calculations made by Babcock and Wilcox to determine the actual stresses induced on lifting pendant components and plenum rib lift points during plenum lift and transfer. Please provide the B&W design specifications for the lifting pendant assemblies, including tolerances, factors of safety, actual vs. allowable stresses, and manufacturing standards for each component. Also provide details of the calculations for induced stresses on the lifting components and plenum ribs, with associated errors.

RESPONSE

The design information and stress calculations for the lifting pendant components and plenum ribs are included in Babcock and Wilcox Document Number 51-1146739-04 entitled, "Design Description of the Equipment for the Final Lift and Transfer of the TMI-2 Plenum Assembly", (see Attachment 2).

QUESTION 2

The enclosed letter report on projected radiation fields near the plenum during lift and transfer, was prepared by Battelle Pacific Nortweast Laboraties (PNL) for the NRC. The calculated dose rates in that report are generally lower than those presented in your plenum lift and transfer SER. Additionally, PNL calculated dose rates directly above the plenum to the be five times greater than the dose rates radially outward from the plenum. Dose rates above the plenum were not included in your SER. Provide your estimate of dose rates above the plenum during lift and transfer. In light of higher dose rates above the plenum, discuss the shielding options available to allow workers access to polar crane if the plenum becomes stuck during transfer. Specify the conditions under which the Fuel Transfer Canal will be flooded to the normal refueling water level and discuss the impact of that action on plenum transfer and future cleanup activities.

RESPONSE

GPU Nuclear has calculated the dose rates from the plenum for access to the crane in the event the plenum becomes stuck during transfer. The general area dose rate contributions attributable to the plenum in areas of concern are:

a. Polar Crane - 75 to 100 mr/hr
b. Lifting Station - 20 to 25 mr/hr
c. Spider Location - 40 to 50 mr/hr

GPU Nuclear does not anticipate the need for staging shielding material for plenum lift. If the plenum sticks at its maximum lift elevation, the personnel in the lift station would be exposed to a radiation field of about 100 mr/hr. They would be able to exit the Reactor Building without significant exposure (i.e., 5 to 10 mr/person).

Access to the Polar Crane is intended to be via the spider lift device. The worse case condition shows a dose rate range of approximately 75 to 175 mr/hr (see Figure 1). Travel time from the 347' elevation to the Polar Crane is approximately 5 to 10 minutes. Assuming the highest dose rate estimated and the longest travel time (i.e, 175 mr/hr and 10 minutes), the dose to personnel accessing the crane would be approximately 30 mr/trip.

GPU Nuclear Radiological Controls Department will verify dose estimates, where practicable, prior to allowing tasks to be performed. Based on those surveys, Rad Con will recommend whether additional shielding is warranted. If potential doses to personnel are estimated to be significantly higher as a result of an unanticipated problem, the option to flood the canal and shield plenum will be considered.

QUESTION 3

As part of our review, the staff will observe the on-site mockup testing of the lifting pendant assemblies. Provide the staff with your testing plan and indicate the date that this mockup testing will be conducted.

RESPONSE

Training exercises are being performed continuously from April 19, 1985, until just prior to plenum removal. Training can be witnessed informally at any time. A formal training exercise is scheduled for 1:00 p.m. on April 30, 1985.

ATTACHMENT 1 (21 Pages)
(4410-85-L-0101)

BWNP-20440-3 (9-84)

BABCOCK & WILCOX
a McDermott company

ENGINEERING INFORMATION RECORD

Safety Related: YES ☐ NO ☒

DOCUMENT IDENTFIER 51 1146739-04

TITLE DESIGN DESCRIPTION OF THE EQUIPMENT FOR THE FINAL LIFT AND TRANSFER OF THE TMI-2 PLENUM ASSEMBLY

PREPARED BY Walter H. Abbott DATE 3/21/85

REVIEWED BY Steve K. Brown DATE 3/22/85

REMARKS:

This document describes the design of the lift and transfer equipment for the final lift and transfer of the TMI-2 plenum assembly to its storage location.

Revision 04 reflects the as-built form of the equipment. Revisions are denoted by (04) in the right hand margin. (04)

BABCOCK & WILCOX
NUCLEAR POWER GENERATION DIVISION

RECORD OF REVISION

NUMBER
51-1146739-04

REV. NO.	CHANGE SECT/PARA.	DESCRIPTION/CHANGE AUTHORIZATION
04	1.0	Corrected lift height; 7 1/4" was 9"
	3.6.1	Revised stress values
	3.6.2	Revised stress values
	4.1.12	Revised source; GPUN was B&W
	6.2.3	Changed wording; removed information concerning spacer plates
	6.2.4, 2nd para.	Changed wording, changed length of cable section; 57" was 13"
	6.2.4, 3rd para.	Changed wording
	6.2.4, 5th para.	Changed wording in the 3rd sub-paragraph
	8.0	Corrected revision levels

PREPARED BY Walter H. Abbott (NAME) Sr. Engr. (TITLE) DATE 3/21/85

REVIEWED BY Steve K. Brown (NAME) PRIN. ENGR (TITLE) DATE 3/22/85

APPROVED BY Larry [illegible] (NAME) Supervising ENGR (TITLE) DATE 3/22/85

DATE:

1.0 INTRODUCTION

Inspections of the TMI-2 reactor internals, which were performed through the control rod drive mechanisms, have revealed physical conditions ranging from no apparent damage to the upper portions of the plenum assembly to sever damage to the reactor's core. Based on both known and expected physical conditions, special methods and tools are being developed to remove the plenum assembly (PA). The initial 7 1/4" of plenum assembly lifting will (04) be accomplished using hydraulic jacks positioned at the component axes. Subsequent plenum lifts into the refueling canal for transfer to storage will be accomplished using the TMI-2 polar crane, selected components of the internals lifting equipment, and special purpose equipment either purchased or manufactured for this task.

2.0 PURPOSE

The purpose of this document is to identify existing and describe the design of new lift and transfer equipment for the final lift and transfer of the TMI-2 PA to its storage location in the flooded deep end of the refueling canal. In addition, design basis information is provided for the equipment.

3.0 BASIC DESIGN INFORMATION

3.1 The design of the final lifting equipment is governed by the Bechtel and B&W documents listed in the references.

3.2 The final lift equipment has been designed to meet the NUREG 0612, Reference 13, and ANSI N14.6, Reference 14, stress criteria. The minimum load safety factors are 3 on yield and 5 on ultimate. A dynamic load factor will be applied to the static design load. The components must be load tested to 1.5 times the design load. The methods of analysis will be those given by the AISC Manual, Eighth Edition, Reference 15. In using these methods to meet NUREG/ANSI stress criteria, the allowable AISC stresses will be modified as follows:

Tension: $F_t \leq .33\ S_y \leq .20\ S_u$
$F_t \leq .25\ S_y \leq .15\ S_u$; for pin connected member

Shear: $F_v \leq .22\ S_y \leq .13\ S_u$

Bearing: $F_p \leq .50\ S_y \leq .30\ S_u$

Compression: Use $.56\ F_a$

Bending: $F_b \leq .37\ S_y \leq .22\ S_u$

Non-load bearing members will be designed to meet allowable AISC stresses.

3.3 Based on the characteristics of the TMI-2 polar crane defined in Reference 1, a dynamic load factor of 1.15 is to be used. The resultant design rated load including the dynamic load factor is 25 tons for each of the three lift points for a total design rated load of 75 tons. Equipment tests are discussed in Section 7.0 below.

3.4 The minimum allowable force in a lifting pendant to prevent damage to the lifting equipment should the plenum assembly hang-up and then break-away while making lowering adjustments with the load positioners or the polar crane is 2W-50,000. "W" is the largest load in a pendant at the start of the final lift operation.

The minimum load at the polar crane load cell to prevent the weight of the tripod from creating excessive compression load in the pendant rod is X-1800. "X" is the load at the polar crane load cell with only the tripod and pendants attached.

Therefore, to provide procedural controls to prevent damage to the lifting equipment use the X-1800 criteria when installing or removing the lifting arms and the value of 2W-50,000 when making adjustments during plenum assembly removal operations.

3.5 Based on the clearance between the keyway on the plenum assembly and the keys on the reactor vessel and the IIF, the plenum assembly can be tilted 0° 15' and 0° 45' respectively without causing binding between the keyway and the keys.

3.6 A summary of the stress analysis given in Reference 3 is as follows:

3.6.1 Plenum assembly lift point (rib)

	Actual (Calculated) (KSI)	Allowable (KSI)	
Bearing	25.30	27.00	(04)
Shear	2.53	6.60	
Bending	8.02	11.10	

3.6.2 Lifting pendant components

	Actual (Calculated) (KSI)	Allowable
Adaptor Plates		
Tension	4.28	6.00
Shear	3.03	5.28
Bearing	8.42	12.00
Bending	2.08	8.88
5-1/4" Diameter Tripod Pin (Applied Force 53,030#.		
Tension	Negligible	--
Shear	1.22	15.60
Bearing	2.53	36.00
Bending	5.60	26.40
3" Diameter Tripod Pin (Applied Force 3,030#)		
Tension	Negligible	--
Shear	0.21	15.60
Bearing	0.25	36.00
Bending	1.71	26.40

Pendant Rods		
Tension	9.81	9.90
Shear (clevis)	4.44	10.40
Shear (threads)	3.00	6.60
Bearing (clevis)	8.25	24.00
Bending (during up-ending)	8.40	11.10
Transfer Block		
Tension	13.54	20.25
Shear (connecting pin)	11.91	17.55
Bearing (connecting pin)	11.95	40.50
Bending	Negligible	--
Lifting Arm		
Tension	3.63	27.00 (04)
Shear	5.56	17.55
Bearing	25.20	40.50
Bending	15.96	29.70

4.0 EQUIPMENT

The following major items of equipment are required for the plenum assembly final lift and transfer operation:

4.1

ITEM	DESCRIPTION	QUANTITY	SOURCE
4.1.1	Polar Crane	1	GPUN
4.1.2	Handling Extension	1	GPUN
4.1.3	Internals Handling Frame (Tripod)	1	GPUN
4.1.4	Internals Indexing Fixture (IIF)	1	GPUN
4.1.5	Defueling Work Platform Support Structure with Decking	1	GPUN
4.1.6	Internals Storage Stand	1	GPUN
4.1.7	Video Inspection/ Monitoring Equipment	1	GPUN
4.1.8	Load Positioner	2	GPUN
4.1.9	Elevation Monitor	1	GPUN
4.1.10	Fixed Length Pendant/ Lifting Arm Assembly	1	B&W

ITEM	DESCRIPTION	QUANTITY	SOURCE	
4.1.11	Load Positioner Pendant/ Lifting Arm Assembly	2	B&W	
4.1.12	Shepherds Hook on a Long Pole	1	GPUN	(04)

Equipment indicated to be provided by GPUN is assumed to meet the design criteria and to be available without further changes to support and/or perform the handling operations described in Reference 4.

5.0 MATERIALS DESCRIPTION

Components of the plenum lifting equipment that will be used in water are stainless steel. Components that will not be used in water are either alloy and/or stainless steel as shown on References 6 through 10.

6.0 EQUIPMENT DESCRIPTION

6.1 General

All existing PA handling equipment designs were reviewed for use in the removal of the TMI-2 plenum assembly. Due to the transients experienced during the accident, the structural integrity of the plenum lifting lug bolts is questionable. Therefore, different attachment points on the plenum assembly are required and as such, new pendant and lifting arm assemblies will be provided.

Pendant rods, adaptor plates, lifting arms and, in the case of the positioner pendant, Hydra-Sets are assembled to comprise new lifting pendant assemblies. The lifting arms are held in such a position by the latching and unlatching system (LUS) that they can be placed under 3 ribs in the PA cover. After the lifting arms are in position and the pull rod in the LUS for each of the pendants is pulled to a new position, the lifting arms automatically lock under the PA ribs. After the pendant is slightly raised, the lock plate will clear the rib and the lock plate and pull rod will be positioned to prevent disengagement of the lifting arm assembly. After transfer operations, the pull rod is then positioned to permit movement of the lifting arm and it will then automatically disengage when unloaded and pushed downward. As a contingency, the lifting arms when not under load can be manually disengaged by lifting with a long handled tool through the 2 inch diameter hole provided on the lifting arm.

Final lifting of the PA will be performed using the equipment listed in Section 4.0 and the plenum assembly will be moved to the internals storage stand located in the flooded deep end of the refueling canal.

6.2 Lifting Equipment

The B&W supplied lifting equipment consists of one fixed length pendant assembly and two load positioner pendant assemblies. The pendant assemblies are attached to the existing handling fixture (tripod) at a radius of 71-1/2 inches from the crane hook swivel centerline. The fixed length pendant is positioned 15° from the PA Y axis towards the Z axis. The load positioner pendants are separated by 120° from the fixed pendant and each other.

The pendant assemblies are approximately 17 feet long from the tripod pin to the bottom of the lifting arms with the load positioners extended 6 inches. The pendant assemblies are illustrated on Reference 8.

The pendant assemblies consist of the following components:

6.2.1 Adapter plates and spacers

Three adapter plates and twelve spacers as shown on Reference 6 will be needed to attach the pendant assemblies to the tripod. The adapter plate is attached to the tripod by means of the tripod's 5-1/4 inch and 3 inch diameter pins.

The spacers center the adapter plate on the connecting pins. The jaw end connector at the upper end of the pendant or load positioner is attached to the adapter plate by means of 2 inch diameter high strength pin. The 2 inch pin will be centered 71-1/2 inches from the centerline of the polar crane hook. Although the adapter plate is attached to the tripod independently of the actual pendants, the adapter plate is considered part of the pendant assembly.

6.2.2 Pendants

Three pendants rods made of 2-3/4 inch diameter stainless steel bars as shown on Reference 6 will be required. One of the pendant rods is 14 ft 5 3/4 inches long and is for the fixed length pendant assembly. The other two pendant rods are 10 ft 7 1/4 inches long and will be used with load positioners to provide length adjustment. The fixed length pendant has a jaw end connection at both ends. The adjustable length pendants have a jaw end connection for connecting to the transfer blocks and an eye end connection for connecting to the load positioners. Each pendant is connected to a transfer block by means of a 2-1/8 inch diameter pin and the transfer block is connected to the lifting arm by another 2-1/8 inch diameter pin at right angles to the first. This system prevents the transfer of any bending moments to the pendant rods.

6.2.3 Lifting arm assemblies

Three lifting arm assemblies as shown on Reference 8 will be required. Each assembly consists of a transfer block, a lifting arm, a spacer plate, a lock plate assembly and a cable pin assembly. The pendant loads are carried through the transfer blocks and the lifting arms into the bottom side of three of the ribs on the cover of the PA. Also, the lifting arm, when in the loaded position, rests on the top of the adjacent rib which eliminates the rotational twist on the rib being lifted. The lock plate assemblies (04) provide a positive means to prevent the lifting arms from becoming disengaged during subsequent lifting operations. The operation of the lock plate assemblies is described in Section 6.2.4 below.

6.2.4 Latching and unlatching system (LUS)

The LUS equipment is shown on Reference 9 and 10. The components are the cable and pull rod assembly and the cable block assembly for each of the pendants and the termination plate.

The cable and pull rod assembly consists of a cable connected to the pull rod by a connecting pin at the cable block assembly. The other end of the pull rod is attached to the lock plate attached to the lifting arm. The other end of the cable is free to permit pulling the cable and pull rod assembly by using a shepherds hook on a long pole. The length of the pull rod is determined by the distance from the lock plate pin in its locked position to the cable block assembly pin connection with the pin connection in the slot marked "Lock" on the cable block assembly. The final position of the cable block assembly will be set during equipment checkout to account for any small variations in the length of this pull rod. Each cable is made up from two sections of cable. The first section which is connected to the pull rod by the pin connection in the cable block assembly, is 57 inches long. The second section, which is connected (04)
by a quick connect device to the first section during the (04)
final assembly, passes through its designated opening in the termination plate and is terminated with a four inch diameter loop. Its length is determined by the distance from the first section to the four inch loop.

The cable block assemblies consist of two guide plates, and two spacer plates. There is a cable block assembly for each pendant. The two guide plates are separated by the two spacer plates. As the guide plates and spacer plates are being assembled, the bolt making the pin connection between the pull rod assembly and the first section of the (04)
cable assembly is fitted into the slots in the guide plates. The assembly is attached to the pendant by bolts and cable block "C" clamps.

The termination plate assembly as shown in Reference 7 consists of the termination plate and two bottom plates. The termination plate assembly is attached to the adapter plate for the "A" lifting pendant which is near the "X" axis of the PA.

The operation of the latching and unlatching system is as follows:

- o Lifting equipment has been assembled and attached to the tripod in the assembly area inside the reactor building. The pin connection in the cable block assembly is in the slot marked "Install".
- o The pendants are lowered onto the PA cover ribs with the pin connections in the install slot in the guide plates. In this position, the lifting arms are held in place by the pull rod.

- Once the lifting arms are in position, each of the cables are pulled to the first stop and released. This operation may be performed by lifting on the pull rod assemblies. The lifting arm will automatically lock under the PA rib and the pull rod will then drop into the slot position marked "Lock" after a slight upward movement of the pendant. The lock plates will then be positioned to prevent the lifting arm from becoming disengaged. (04)

- After the PA has been transferred to the internals storage stand, but while the lifting arms are still loaded, each of the cables are pulled to the second stop and released. The pin connection will then drop into the slot position marked "Unlock" and the lock plate will be positioned to permit the lifting arm to rotate and disengage.

- The pendants are lowered slightly with the polar crane to disengage the lifting arms. After the lifting arms are disengaged, each of the cables are pulled to the third stop and released. The pin connection will drop into the slot position marked "Remove" and the lifting arm will be held in a position to permit its removal from the PA.

6.3 Load positioners

An integral part of the lifting pendants is the load positioners to be provided by GPUN. Since these are to be provided by GPUN, the description of the positioners may vary from that given below.

The load positioners will indicate the load, load direction (up or down) and distance traveled. Each positioner will have 12 inches travel and be capable of re-positioning (raising or lowering) 6 inches. The positioners are capable of remote operation with remote load/movement indication. Two positioners are required, one for each positioner pendant assembly.

6.4 Accessory equipment

In addition to the major equipment items, as described in 6.1 through 6.3 above, support or accessory equipment items such as monitoring, viewing, and lighting equipment may be needed for the plenum final lift and transfer to storage. In many instances, equipment used in previous operations should be adequate to be used for the final lift and transfer operation. The equipment required will depend upon the results of the inspections performed during the initial lift.

6.4.1 Level and load monitoring equipment

During the plenum final lift, component levelness, and load, will be monitored to minimize the possibility of component binding and to aid in its correction if necessary. Plenum levelness will be monitored by the device described in Section 4.4.4 of Reference 11.

6.4.2 Cable Pulling Equipment

A shepherds hook attached to a long handled pole will be needed to pull the cables in the LUS described in 6.2.4 above and to manually disengage the lifting arm, if required.

6.4.3 Viewing equipment

Based on the results of the initial inspections, observations may be accomplished visually or by CCTV cameras. The cameras are described in Reference 12.

7.0 EQUIPMENT TESTS

Each pendant assembly will be load tested to at least 37.5 tons. This value represents 1.5 times the design rated load of 25 tons, see 3.3 above.

8.0 REFERENCES

Becthel

1.	Specification 15737-2-R-200A(Q)	Technical Specification for Plenum Assembly Removal System for GPU Nuclear Corporation Three Mile Island - Unit 2 Nuclear Power Plant	

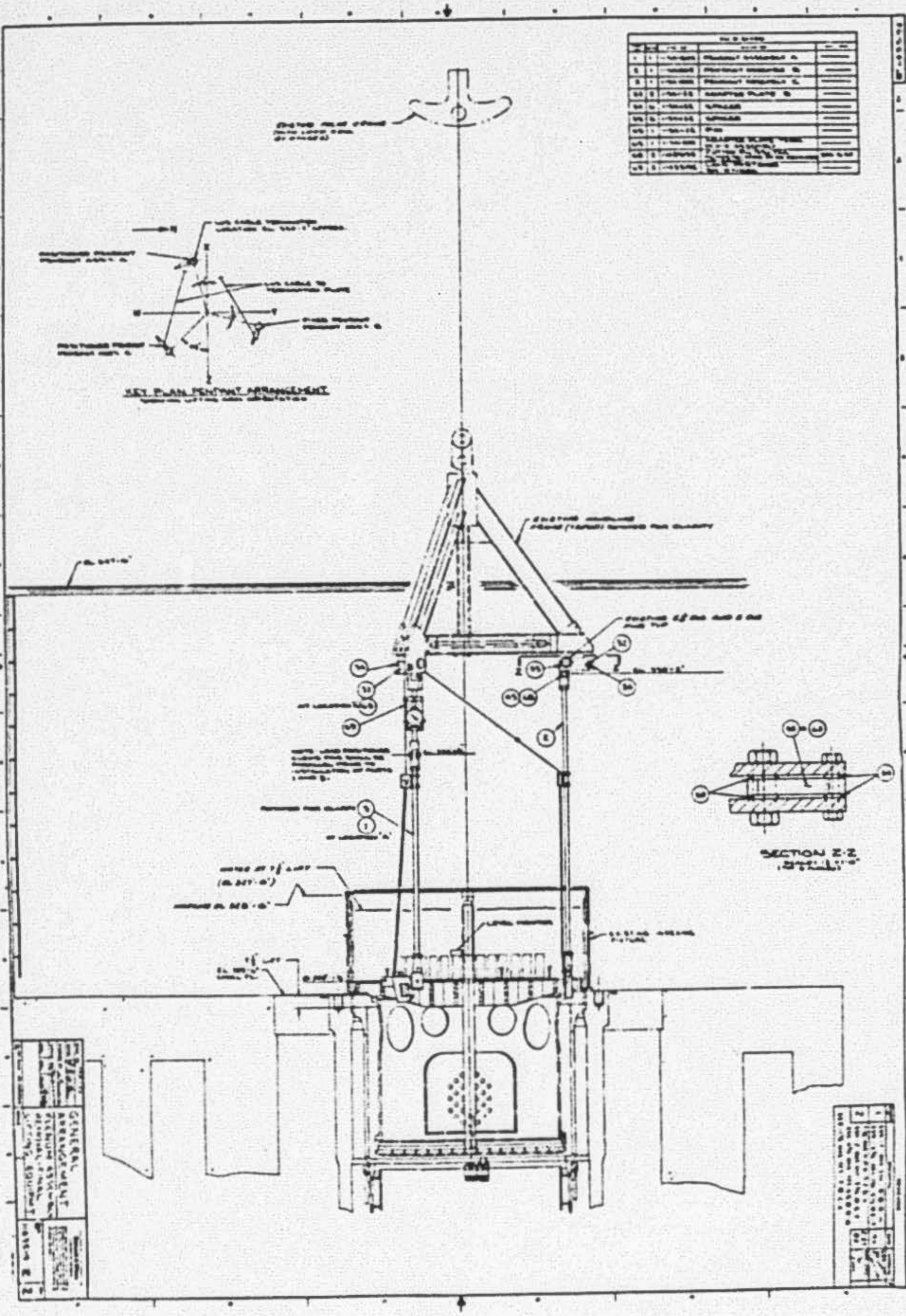
B&W

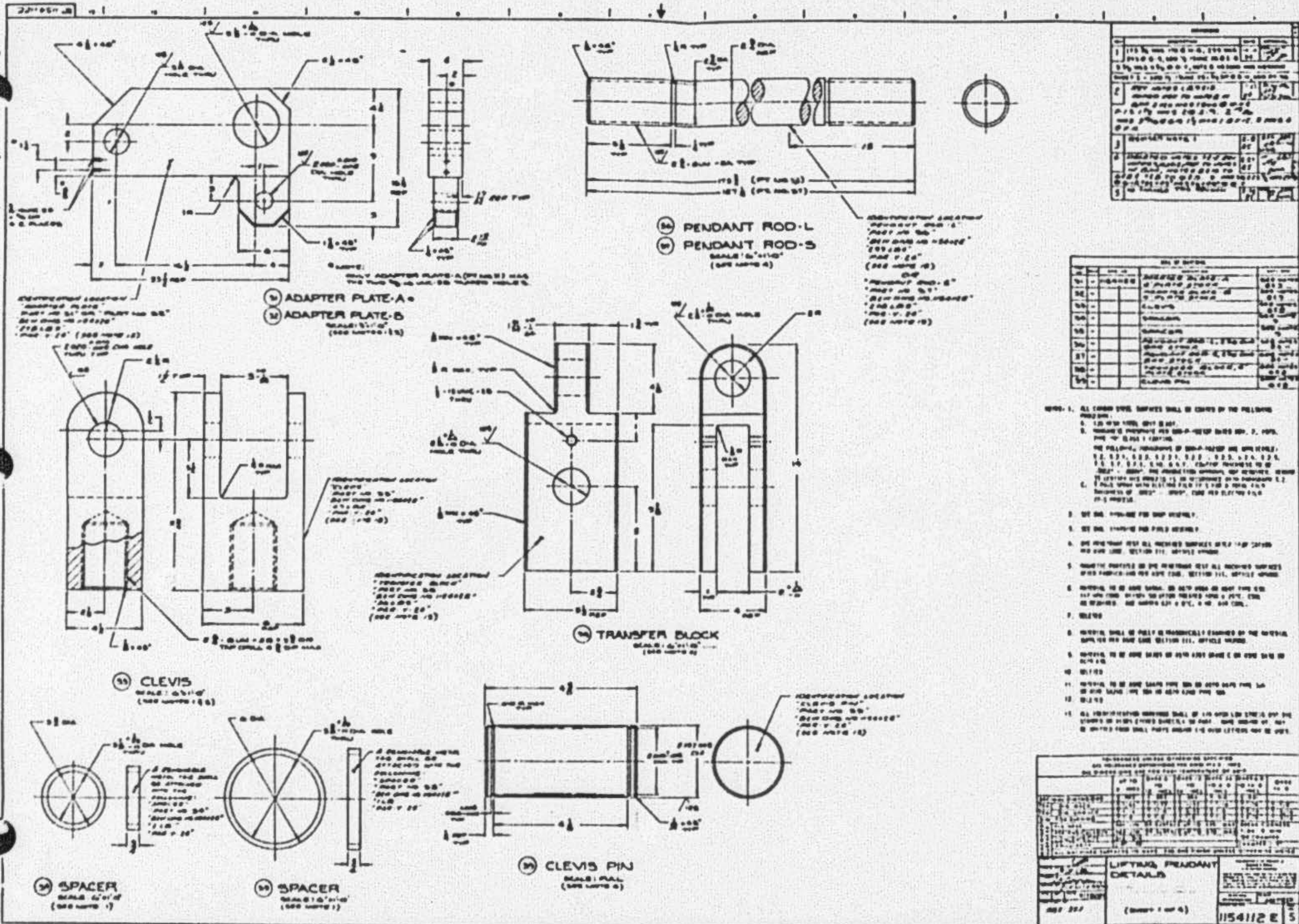
2.	51-1145018-05	Engineering Requirements for Plenum Assembly Removal Handling Equipment	(04)
3.	32-1153534-03	Structural Analysis of Plenum Assembly Removal Handling Equipment	(04)
4.	51-1146737-03	Final Lift and Transfer, In-Containment Installation/Operation Sequence	
5.	1143519E-02	General Arrangement Plenum Assembly Removal Final Lift Equipment	(04)
6.	1154112E-05	Lifting Pendant Details	(04)
7.	1154164E-02	Lifting Pendant Termination Plate Assembly and Details	(04)
8.	1154180E-04	Lifting Pendant Assembly and Sub-assemblies	(04)
9.	1154152E-02	Lifting Pendant Locking Device Details	(04)

10. 1154184D-03	Cable Block Assembly	(04)
11. 51-1142474-02	Engineering Requirements for Initial Lifting Jacking System and Monitoring	
12. 1143214A-1	TMI-2 Final Design Description for Video Inspection System	

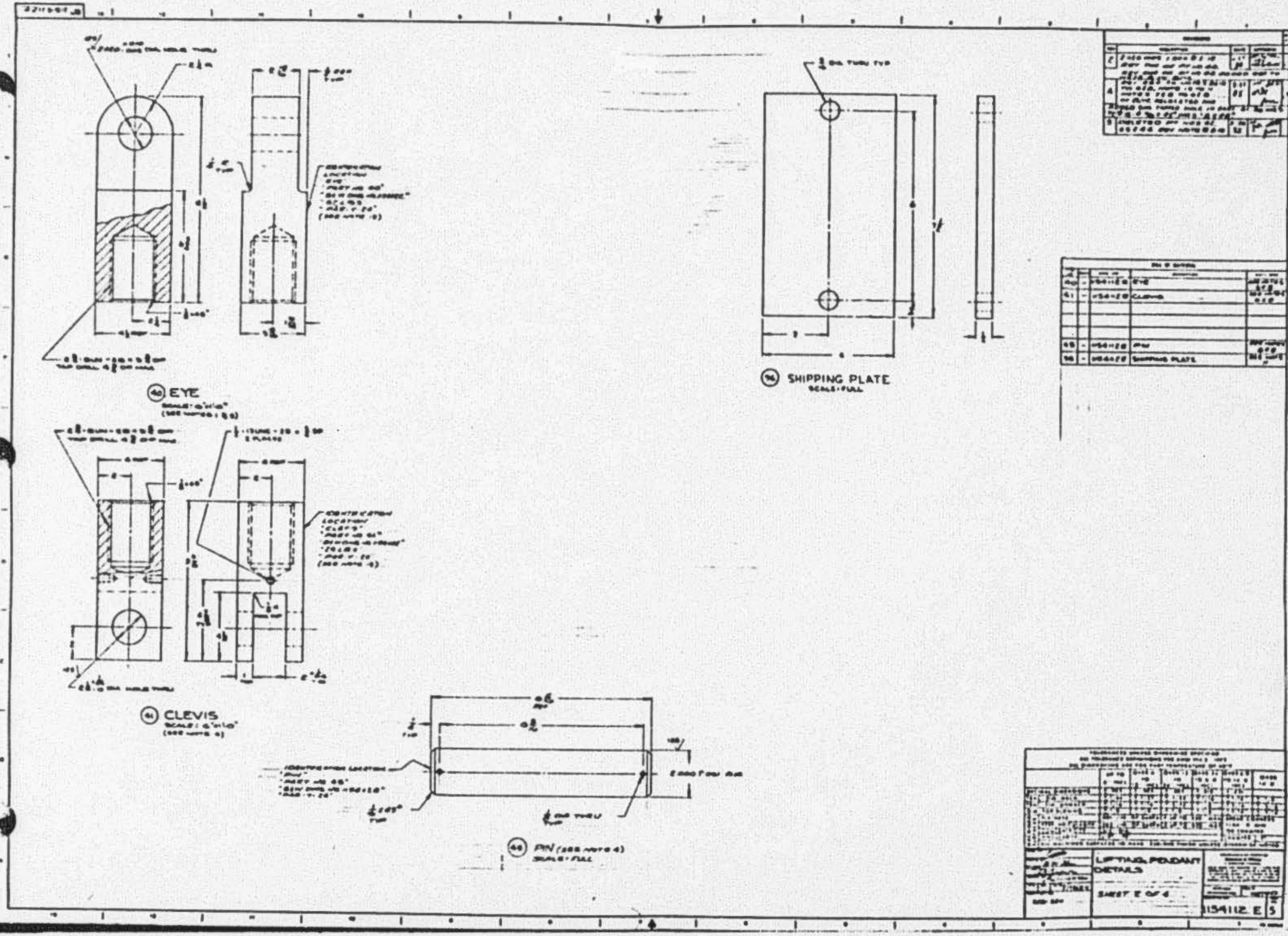
Industry Standards

13. NUREG 0612	Control of Heavy Loads at Nuclear Power Plants
14. ANSI N14.6	American National Standard for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials
15. American Institute of Steel Construction (AISC) Eight Edition	Manual of Steel Construction

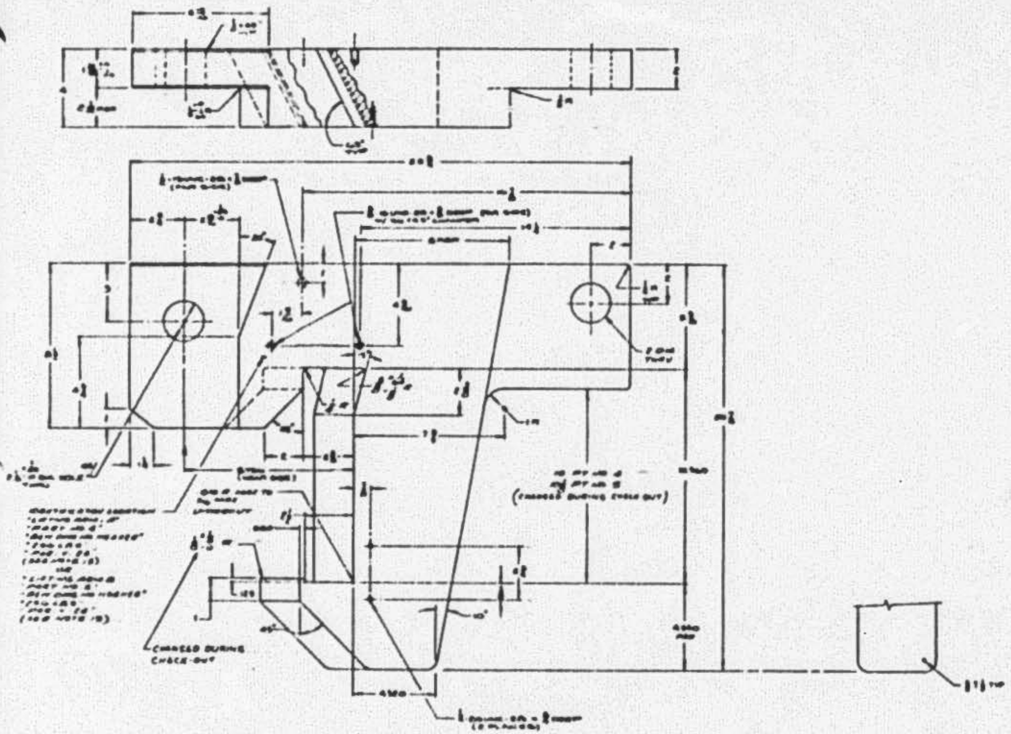

KEY PLAN PENDANT ARRANGEMENT
SECTION Z-Z
GENERAL ARRANGEMENT



ADAPTER PLATE-A
ADAPTER PLATE-B
PENDANT ROD-L
PENDANT ROD-S
TRANSFER BLOCK
CLEVIS
SPACER
SPACER
CLEVIS PIN
LIFTING PENDANT DETAILS
1154112 E



40 EYE
41 CLEVIS
44 PIN (SEE NOTE 4)
SCALE: FULL
96 SHIPPING PLATE
SCALE: FULL
LIFTING PENDANT DETAILS
SHEET 2 OF 4
154112 E 5



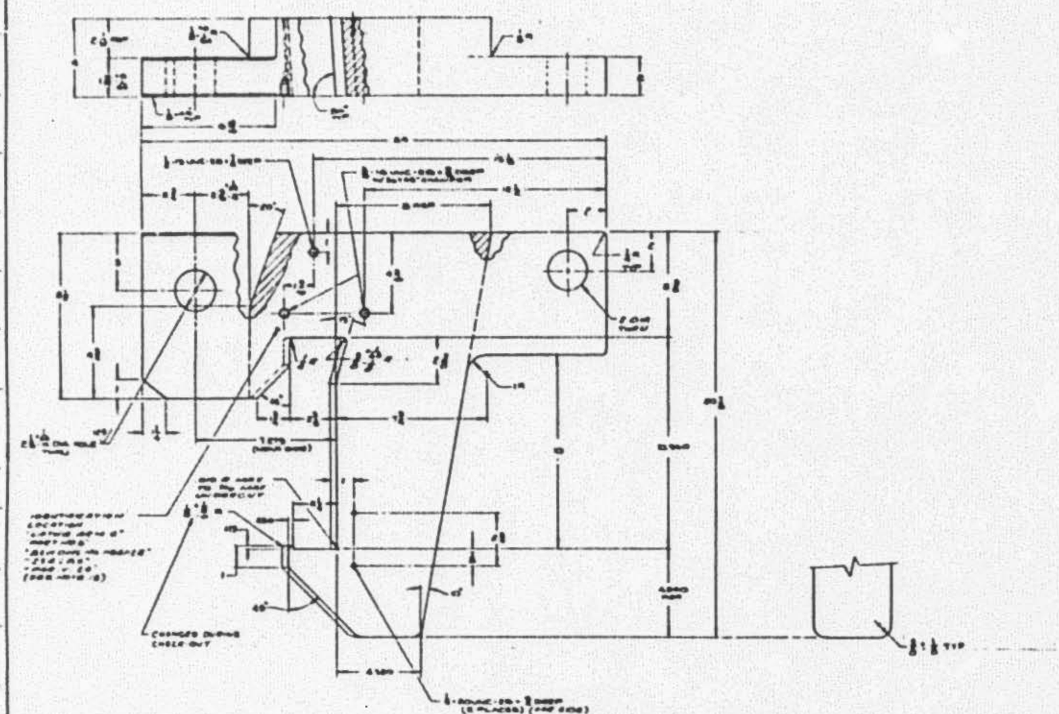
(4) LIFTING ARM-A

(5) LIFTING ARM-B

LIFTING PENDANT DETAILS

SHEET 2 OF 4

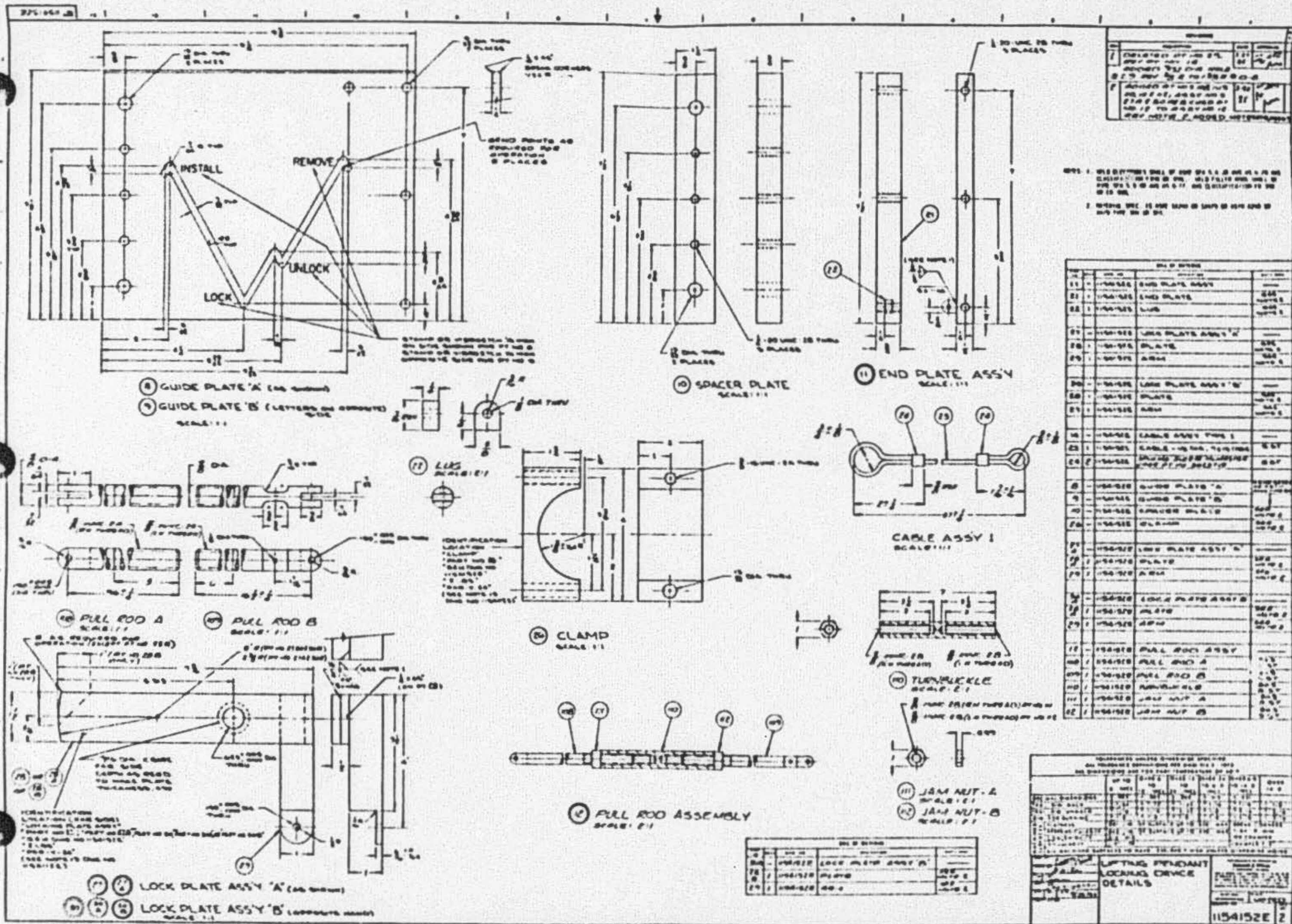
115A112 E 5



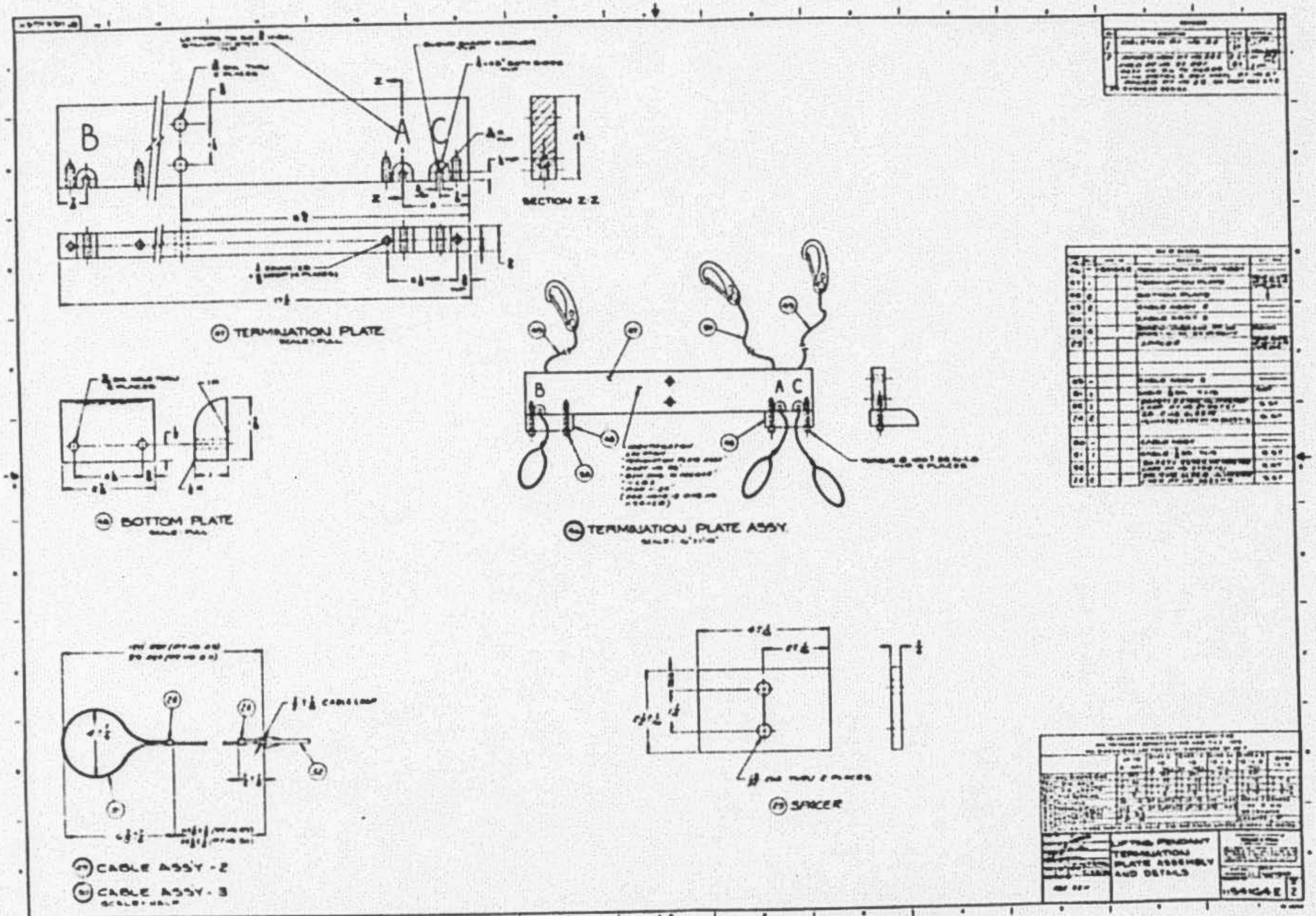
(6) LIFTING ARM-C

LIFTING PENDANT
DETAILS
SHEET 4 OF 4

1134112 E 5



INSTALL
REMOVE
UNLOCK
LOCK
GUIDE PLATE 'A'
GUIDE PLATE 'B'
SPACER PLATE
END PLATE ASS'Y
LUG
CLAMP
CABLE ASSY 1
PULL ROD A
PULL ROD B
TURNBUCKLE
PULL ROD ASSEMBLY
JAM NUT - A
JAM NUT - B
LOCK PLATE ASS'Y 'A'
LOCK PLATE ASS'Y 'B'
LIFTING PENDANT
LOCKING DEVICE
DETAILS
1154152E
2


B
A C
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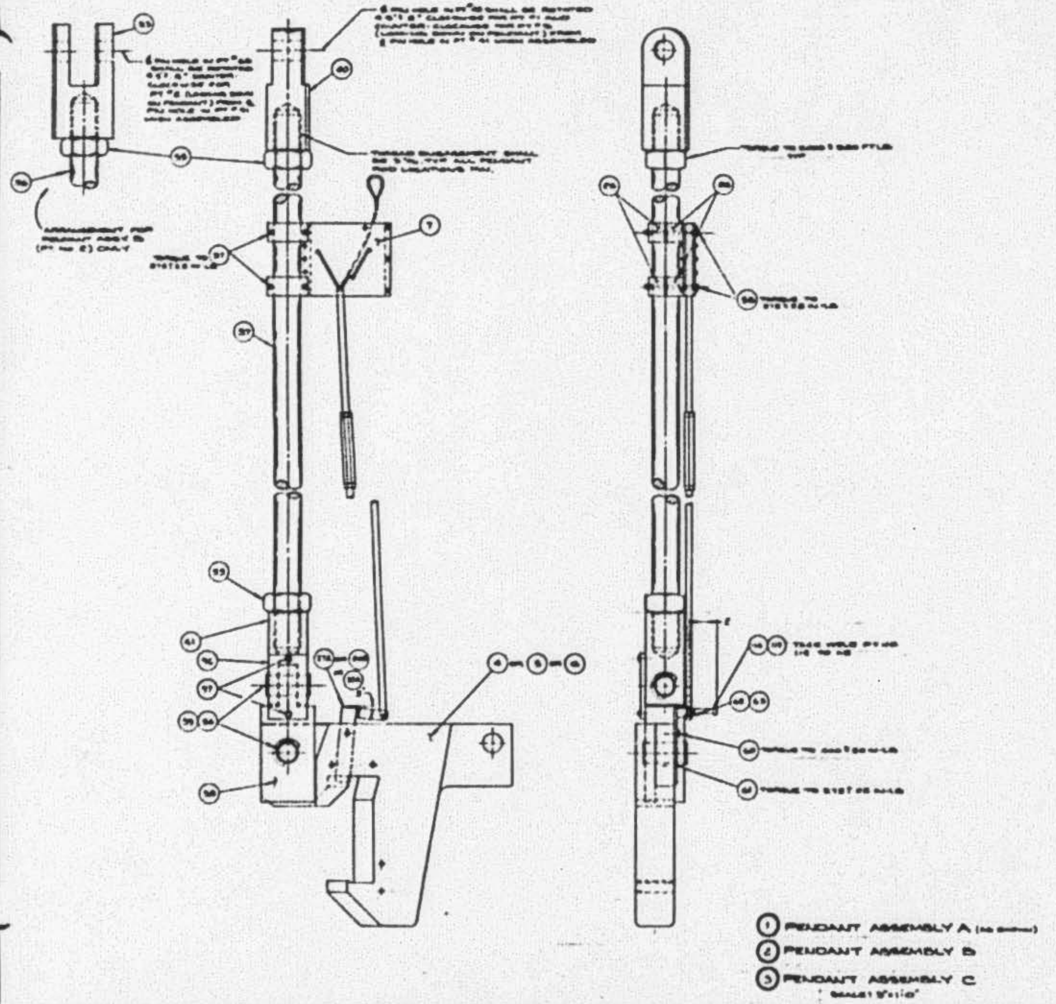
TERMINATION PLATE
BOTTOM PLATE
TERMINATION PLATE ASSY.
CABLE ASSY -2
CABLE ASSY - 3
SPACER



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6	[illegible]	[illegible]	[illegible]	[illegible]	LIFTING ARM C	[illegible]
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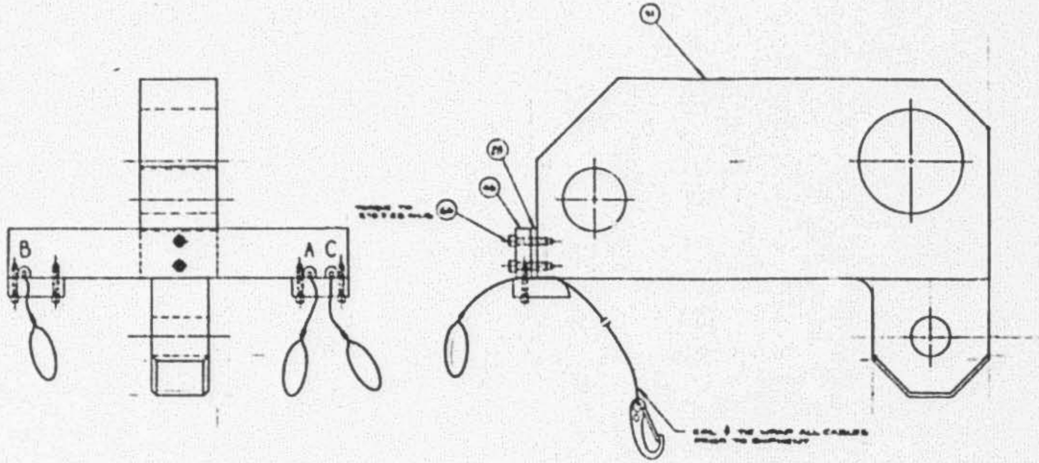
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	STOPPING PLATE	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1. [illegible]
2. [illegible]

1 PENDANT ASSEMBLY A
2 PENDANT ASSEMBLY B
3 PENDANT ASSEMBLY C

LIFTING PENDANT ASSEMBLY & SUB-ASSEMBLIES

1154160 E 4



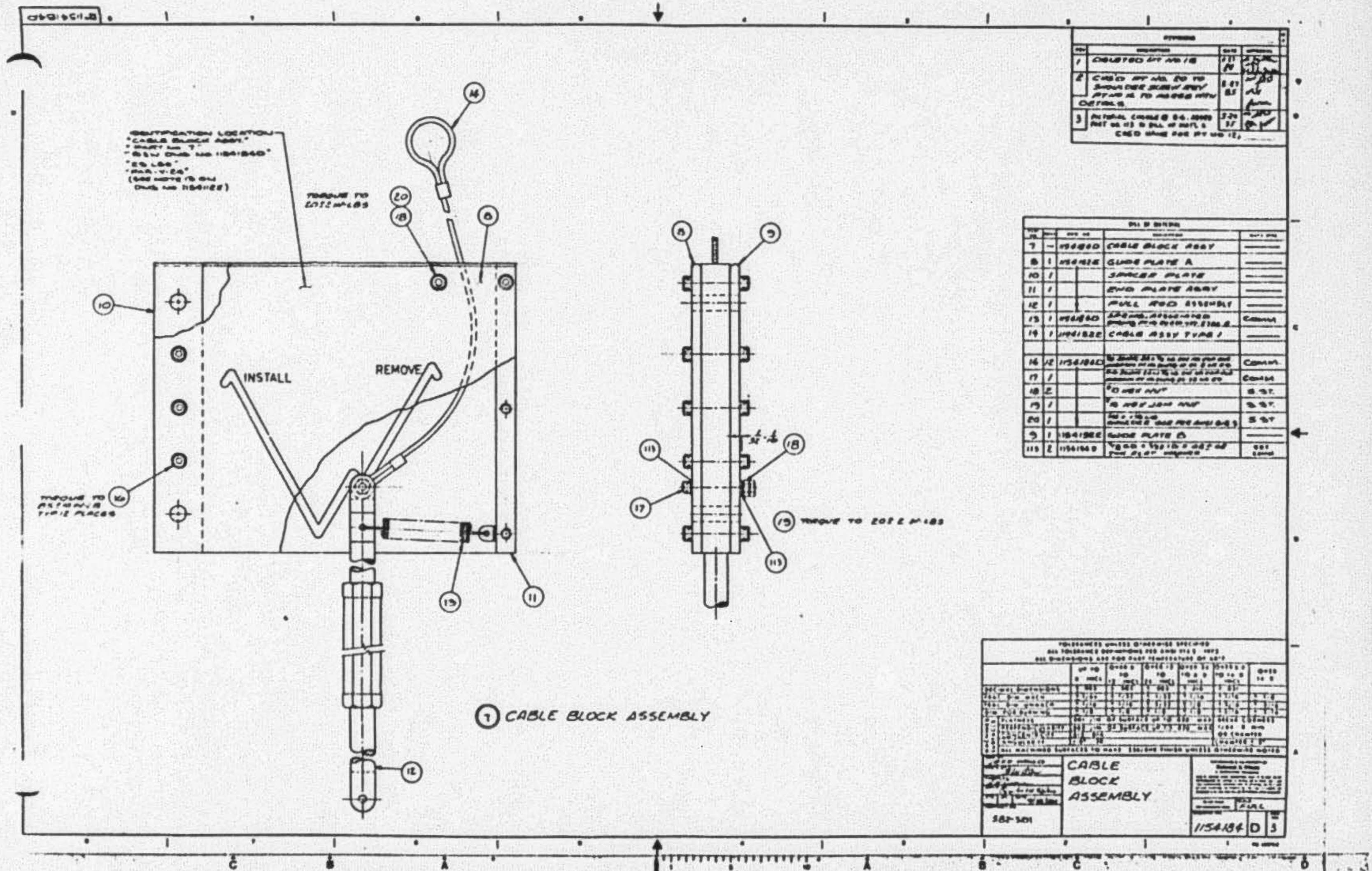
(65) ADAPTER PLATE / TERMINATION PLATE ASSEMBLY

[illegible]	–	[illegible]	ADAPTER PLATE / TERMINATION PLATE ASSY	
[illegible]	1	[illegible]	ADAPTER PLATE - A	
[illegible]	1	[illegible]	TERMINATION PLATE ASSY	
[illegible]	2	[illegible]	[illegible]	
75	1	[illegible]	SPACER	

LIFTING PENDANT ASSEMBLY & SUB-ASSEMBLIES

(SHEET 6 OF 6)

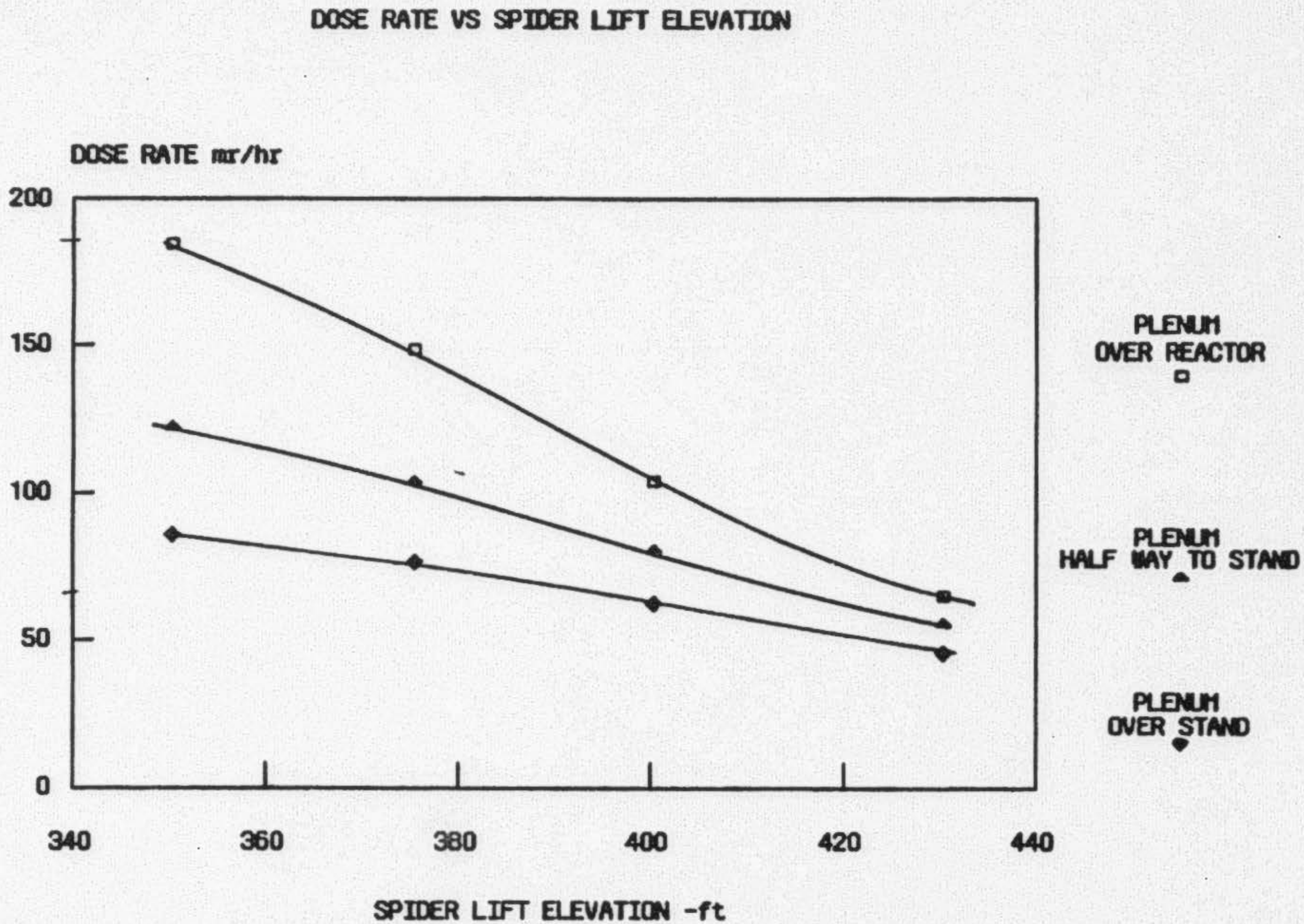
1154180E | 4



INSTALL
REMOVE
TORQUE TO 20±2 IN-LBS
CABLE BLOCK ASSEMBLY
CABLE BLOCK ASSEMBLY
GUIDE PLATE A
SPACER PLATE
END PLATE ASSY
PULL ROD ASSEMBLY
CABLE ASSY TYPE I
GUIDE PLATE B
1154184
D
3

Attachment 1

FIGURE 1
(4410-85-L-0101)



Dose rate from plenum calculated when the bottom of the plenum is at the maximum transfer elevation 333'11-3/4".