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10 CFR 50.90
L-2010-214
September 21, 2010

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
License Amendment Request No. 202
Response to Request for Additional Information

References:
1) FPL Letter L-2010-022 dated February 16, 2010, License Amendment Request No. 202, Technical Specification Changes Regarding Heavy Loads over the Spent Fuel Pools
2) NRC Letter dated August 24, 2010, Turkey Point Units 3 and 4 - Request for Additional Information Regarding Technical Specification Changes for Heavy Loads Over the Spent Fuel Pools (TAC Nos. ME3379 and ME3380)

Florida Power and Light Company (FPL) submitted an application for amendment to the Renewed Facility Operating Licenses for Turkey Point Units 3 and 4 in Reference 1. The NRC requested additional information (RAI) concerning the application in Reference 2. FPL's response to the RAI is enclosed.

Please contact Mr. Robert Tomonto at 305-246-7327 if there are any questions about this license amendment application and RAI response.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on Sept 21, 2010

Very truly yours,

Michael Kiley
Vice President – Turkey Point Nuclear Plant

Enclosure: Response to NRC Request for Additional Information dated August 24, 2010

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant
Turkey Point NRC Project Manager
Mr. W. A. Passetti, Florida Department of Health

A001
NRR

Enclosure

Response to NRC Request for Additional Information dated August 24, 2010

As requested by letter dated August 24, 2010, Florida Power and Light Company (FPL) hereby responds to the additional information requested by the NRC concerning the license amendment application submitted by FPL on February 16, 2010 (Reference). Each request and its response follow:

1. Section 3.0, "Background," of the licensee's February 16, 2010, submittal notes, in part, that the licensee is upgrading the spent fuel cask handling crane to a single-failure-proof crane design, and is also upgrading the crane support structure.

   Submit design information to provide reasonable assurance that the new crane support structure will meet the appropriate design specifications.

FPL Response to RAI 1

Attachment 1 contains PC/M 07-047, Revision 2, Turkey Point Cask Crane – Support Structure Upgrade. This document is the Engineering Package utilized for the design and installation of the upgrades to the spent fuel cask handling crane support structure.

2. Section 3.0, "Background," of the submittal notes, in part, that the licensee has decided on the implementation of an Independent Spent Fuel Storage Installation (ISFSI) for future storage of spent fuel in a dry cask storage system.

   Confirm that the proposed ISFSI will be addressed in a separate licensing submittal.

FPL Response to RAI 2

FPL is installing an ISFSI under the general license provisions of 10 CFR 72, Subpart K - General License for Storage of Spent Fuel at Power Reactor Sites. 10 CFR 72.214 of Subpart K lists approved spent fuel storage casks by certificate number. Turkey Point will utilize the storage system under Certificate 1030. Separate licensing submissions concerning that facility will be on Docket No. 72.62 and are not part of the license amendment application associated with this request for additional information.

3. Section 5.0, "Regulatory Analysis," of the licensee's February 16, 2010 submittal notes that Criteria 1 through 4 of Title 10 of the *Code of Federal Regulations,* Section 50.36(c)(2)ii are

not applicable to Technical Specifications (TSs) 3/4.9.7 and 3/4.9.12, and that the TSs can, therefore, be relocated to other licensee-controlled documents.

Describe how the TS restrictions will be maintained when the TSs are relocated to the Updated Final Safety Analysis Report or to other licensee-controlled documents.

FPL Response to RAI 3

The discussion in Section 5.0, Regulatory Analysis, of the February 16, 2010 FPL application is a general discussion of regulatory requirements applicable to various aspects in the application. Each regulatory requirement discussed is not applicable to the basis for change of both TS 3/4.9.7 and 3/4.9.12. The discussion concerning the four criteria in 10 CFR 50.36(c)(2)ii only applies to the basis for deleting TS 3/4.9.7 from the TS, as discussed in Section 4.0.A of the application.

The basis for deleting TS 3/4.9.12 from the TS, as discussed in Section 4.0.B of the application, is the installation of the new single-failure-proof cask handling crane that precludes the need for assuming a drop of the cask. Upon approval of the application to delete TS 3/4.9.12, Updated Final Safety Analysis Report (UFSAR) Section 14.2.1.3, Cask Drop Accident, will be deleted. TS 3/4.9.12 contains certain initial conditions assumed in the cask drop accident analysis described in UFSAR Section 14.2.1.3 that will no longer be needed to be met when handling a cask with the new single-failure-proof crane and handling system meeting the applicable requirements of NUREG-0612, Control of Heavy Loads at Nuclear Power Plants, Section 5.1.6, Single Failure Proof Handling Systems, July 1980.

The requirements of TS 3/4.9.7 will be relocated to the UFSAR and plant heavy load handling procedures. This will ensure that restrictions on movement of the cask crane over fuel assemblies in the spent fuel pool are in place for loads greater than 2000 pounds that are not handled by the single-failure-proof cask crane with a handling system meeting the applicable requirements of Section 5.1.6 of NUREG-0612. Otherwise, the crane travel restrictions of relocated TS 3/4.9.7 for loads greater than 2000 pounds would not be applicable when handled by the new single-failure-proof crane with the handling system meeting the requirements of Section 5.1.6 of NUREG-0612.

4. Section 8.2, "Static and Dynamic Load Tests," of Attachment 3 of the submittal notes, in part, that load testing of the fully assembled crane will be completed on site to verify the proper operation and structural integrity of the replacement bridge and runway support structure. Site load testing is performed at 125 percent of the crane maximum critical load design rated load.

Describe how the test procedure for the fully assembled crane will verify the proper operation and structural integrity of the replacement bridge and runway support structure.

FPL Response to RAI 4

Proper operation of the fully assembled crane will be demonstrated through the performance of the Site Functional Test in accordance with procedure REP-20872-013, Revision 2 (Attachment 2). The trolley of the replacement crane has been fully load tested at 125% of the crane's maximum critical load during Factory Acceptance Testing, structural integrity of the replacement bridge and runway support structure will be demonstrated through the performance of the Site Load Test in accordance with procedure REP-20872-014, Revision 2 (Attachment 3). A copy of these procedures is attached.

Reference: FPL Letter L-2010-022 dated February 16, 2010, License Amendment Request No. 202, Technical Specification Changes Regarding Heavy Loads over the Spent Fuel Pools

Attachments:
1) PC/M 07-047, Revision 2, Turkey Point Cask Crane – Support Structure Upgrade
2) Site Functional Test Procedure, REP-20872-013, Revision 2
3) Site Load Test Procedure, REP-20872-014, Revision 2

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
License Amendment Request No. 202
Response to Request for Additional Information

Enclosure
Attachment 1

PC/M 07-047, Revision 2
Turkey Point Cask Crane – Support Structure Upgrade

PC/M COVER SHEET

PC/M No. 07-047 **Revision** 2 **Supplement** _____

Safety Classification: ☒Safety Related ☐Quality Related ☐Non-Safety Related

Unit(s) ☒ Common ☐3 ☐4

1. Title: Turkey Point Cask Crane - Support Structure Upgrade

2. Sponsor's Name: D. Meade Department: NPE

☐ This PC/M is a Document Change Only.

☒ This PC/M requires modifications to the plant and is not Document Change Only.

3. Implementing Department:

☐ Electrical ☐ Mechanical ☐ I&C ☒ Projects ☐ SAO ☐ Engineering

4. This PC/M has been reviewed by the Maintenance Department. (See QI 3-PTN-1, Step 3.10.2.)

Sign: CCBEARS for Vaughn Harris (per telecon) 11/12/09
(Maintenance Manager or designee) *(Date)*

5. This PC/M has been reviewed by the Operations Department. (See QI 3-PTN-1, Step 3.7.3.)

Sign: R.J. [signature] 11/13/09
(Operations Manager or designee) *(Date)*

** 6. Reviewed by Plant Nuclear Safety Committee: 09-071 11/18/09
or Subcommittee (as applicable) *(PNSC No.)* *(Date)*

Sign: R.V. [signature] 11/18/09
(PNSC Chairman) *(Date)*

7. Approved by: [signature] 11/18/09
Plant General Manager *(Date)*

* 8. Verification of PC/M Completion: _____ _____
(Engineering Representative) *(Date)*

* Signatures required for completed turnover packages only.
** MSPs and NNS MEPs are EXEMPT from PNSC review.

FPL NUCLEAR ENGINEERING

ENGINEERING PACKAGE

PC/M NO: 07-047 REV: 2 SUPPL: |

PLANT: TURKEY POINT UNIT: 3 and 4

TITLE: TURKEY POINT CASK CRANE - SUPPORT STRUCTURE UPGRADE

REVISION DESCRIPTION: Incorporate Cask Crane Support Structure Erection Drawings into the PCM. |

LEAD DISCIPLINE: C/S EXPIRATION DATE: 12-31-10

CAR NO: 05-106 DWA NO:

PC/M CLASSIFICATION: SR X QR NNS

DESIGN ORGANIZATION: FPL DISC CHIEF REVIEW REQD? YES NO X |

EXTERNAL INTERFACES: N/A DISC CHIEF SIGNATURE:

REVIEW/APPROVAL:

GROUP	INTERFACE TYPE			PREPARED	VERIFIED	APPROVED	FPL APPROVED*
	INPUT	REVIEW	N/A				
MECH			X				
ELECT			X				
I&C			X				
CIVIL	X			D. Mas	11/9/09	11-9-09	
DESIGN BASIS**		X				11/11/2009	
CSI			X				
NUC FUEL			X				

* For Contractor Prepared EPs As Determined By Engineering Manager ** Review Interface As A Minimum On All EPs

FPL ENGINEERING MANAGER APPROVAL: DATE: 11/11/09

LIST OF EFFECTIVE PAGES

PAGE NO.	REV	REV
1	0	2
2	0	2
3	0	1
4	0	2
5	0	1
6	0	2
7	0	1
8	0	1
9	0	1
10	0	1
11	0	1
12	0	1
13	0	1
14	0	1
15	0	1
16	0	1
17	0	1
18	0	1
19	0	1
20	0	1
21	0	1
22	0	1
23	0	1
24	0	1
25	0	1
26	0	1
27	0	2
28	0	2
29	0	1
30	0	1
31	0	1
32	0	1
33		1

TABLE OF CONTENTS

LIST OF ATTACHMENTS

ABSTRACT

The Turkey Point Plant Units 3 and 4 (PTN) currently uses a single 105/15-ton main/auxiliary hook capacity, overhead bridge-type Cask Crane to service the Auxiliary Buildings. It is identified as "H4" in the PTN Total Equipment Data Base (TEDB). The crane is located outdoors, adjacent to the laydown areas and the plant road, where it can access each unit's Auxiliary Building. The existing crane is not single failure-proof and the original design of the support structure included static seismic factors only. Access to the cask handling/storage area of each unit's spent fuel pool is through an opening in the Auxiliary Building's roof and east wall, which is normally closed by an inverted sliding "L" shaped door and opened for cask loading. The crane is prevented from carrying a load over the fuel storage areas of the spent fuel pools by electrical interlocks and the physical location of the sliding roof/door opening, (Ref. UFSAR Section 9.5).

Based on current inventory and anticipated future generation of spent fuel, the Full Core Offload (FCOL) reserve capacity for storage of spent fuel will be adequate until 2010 (Unit 3) and 2012 (Unit 4). Therefore, Florida Power and Light (FPL) has decided to implement an Independent Spent Fuel Storage Installation (ISFSI) at PTN for future storage of spent fuel in a dry cask storage system. To facilitate the future cask handling operations, the crane must be upgraded to 130/26-ton main/auxiliary hook capacity, meeting single failure-proof criteria per NUREG-0554.

Since the support structure provides support to the upgraded crane, it will be upgraded by this PC/M to a Seismic Category 1 (Class I) SSC with the safety classification upgraded from Quality Related to Nuclear Safety Related.

A detailed 3D combined crane/support structure analysis (Reference IV.5.8) was performed to meet these upgraded conditions. The results of the analysis revealed that extensive structural modifications are required. These modifications will include reinforcement, replacement and addition of new framing and foundations to the A-Frames on the east side; addition of new framing and connections on the roof of the Auxiliary Building on the west side; replacement of the entire longitudinal bracing systems on the east side; replacement of the stability trusses for the plate girder on both east and west sides; and replacement of the crane rail with all new attachments.

All new structural and miscellaneous steel will be procured as Procurement Class (PC) 1 or 2 and components of the existing structure that remain in the upgraded structure will be accepted by a commercial grade dedication process.

The scope of this PC/M includes the activities required for removing existing members and installing the modifications described above, along with the associated engineering analysis and design. Structural integrity of the entire support structure shall be maintained during the installation process.

Removing the existing crane and installing the new crane are covered under the PC/Ms 07-048 and 07-049 respectively. Modifications needed to resolve interferences are addressed in PC/M 07-050.

Installation of this PC/M will require handling of heavy loads. All heavy loads will be handled in accordance with FPL commitments to the NRC in response to NUREG-0612 and plant procedures. A defense-in-depth approach will be adopted for heavy load handling by providing either redundant rigging (i.e., each having a 5:1 safety factor) or a single rigging with a 10:1 safety factor. All rigging and other lifting devices used in the implementation of this PC/M will meet this requirement. In addition, guidelines provided in NUREG-0612 Section 5.1, for the control of heavy loads, including safe load path definition, following plant procedures for heavy load handling, crane operators' training, crane inspection, etc., shall be strictly followed to minimize the probability of load drop.

It is anticipated that a mobile crane will be used for demolition and erection of the support structure. The mobile crane capacity will also be selected accordingly (i.e., the nominal capacity will be greater than twice the maximum lifted load). Mobile crane operations, including boom movement with the load will be administratively controlled via procedures including adherence to load limitations over safety-related SSCs.

Implementation of this PC/M will have no adverse effects on the safe operation of the plant or safe shutdown of the plant. The activities conducted in accordance with this PC/M do not adversely affect any safety related System, Structure, Component (SSC) or function. PC/M 07-047 can be implemented with the plant operating or shutdown since the activities can be accomplished in accordance with the existing Technical Specifications and licensing bases described in the Updated Safety Analysis Report (UFSAR). Activities conducted under this PC/M will not require prior NRC approval in accordance with 10CFR50.59 as demonstrated in the 50.59 Applicability/Screening (Attachment 2).

Revision 1 issues the entire document (as revision 1) with changes made marked by a revision bar in the right hand column. All pages are shown as revision 1 for administrative purposes only. All attachments except Attachment 1 remain unchanged and are not included in this package. The 10CFR50.59 Screening, approved in Revision 0 of this PC/M, is not affected by any changes made in Revision 1 of this PC/M.

Revision 1 to this EP provides a revised design for load transfer at the structural steel and concrete interface at column lines E1 and E6 to facilitate constructability. Also, due to the interference with an existing duct bank between column lines E5 and E6, the grade beam spanning between E5 and E6 will not be continuous. E5 and E6 will have independent grade beams with 4 piles each as shown in revised Attachment 1.

Revision 1 releases the "Holdpoint" at Bent 4.4, since a revised construction efficient design has been developed at this location and also releases the "Holdpoint" at the existing diagonal column of Bent 2.7. Revision 1 deletes drawings 5610-C-1930 thru 1934, as the information on these drawings has been appropriately placed on applicable steel drawings.

Revision 2 of this EP is issued only to incorporate 20 cask crane support structure erection drawings into the PC/M. Only affected pages of the PC/M are issued with Revision 2. A limited number of erection drawings have been issued against Revision 1 of the PC/M via CRN's in order to permit field work to be performed. Revision 2 will include re-issuance of these previously CRN issued drawings as well, see Attachment 14. All the erection drawings issued by this revision have been developed by the Fabricator and assigned FPL drawing numbers. All these drawing numbers are 5610-C-1921 with respective sheet numbers from 3 to 22. The revision level of the erection drawings issued by this PC/M Rev. 2 are Rev. 0.

The 10CFR50.59 Screening, approved in Revision 0 of this PC/M, is not affected by any changes made in Revision 2 of this PC/M.

This PC/M contains the following "Holdpoint":

Auxiliary Building Roof Anchorages at Bent W 2.7 (existing vertical column and new diagonal column locations) and at Bent W 3.6 (existing vertical and diagonal column and new diagonal column locations).

WGI Actions required for this Holdpoint are:

1. Develop suitable construction efficient designs at the two bents capable of withstanding the reaction loads calculated in calculation FPL001-CALC-001 Rev 1.

2. Revise steel drawings to include details of the new anchorage designs including the anchor bolt details.

3. Revise concrete drawings to include details of concrete removal and new concrete/grout bedding for the new anchorages.

4. Revise concrete calculation FPL001-CALC-002 Rev 1 to qualify the new anchorage designs.

Release: This holdpoint can be released by:

1. FPL review and acceptance of the documents discussed for revision above.

2. WGInt revising this PC/M by revision or Change Request Notice (CRN).

I. DESIGN

I.1. Structure, System, or Component (SSC) Involved:

This PC/M is in support of the cask crane upgrade required for the ISFSI project, which includes the cask crane structural steel supporting frames and foundations as the primary SSC. The crane support structure has isolated footings on the east side and is supported on the Auxiliary Building roof and walls on the west side. Since the seismic response spectrum for the Auxiliary Building is provided at ground level only, the entire Auxiliary Building, including foundations, is affected. The SSCs involved and/or affected by this PC/M are:

- the Auxiliary Buildings (Unit 3 and Unit 4)
- cask crane support structure (including foundations),
- the cask crane runway girder rails and associated attachments
- any existing SSCs and functions that could potentially be adversely affected by the activities conducted under PC/M 07-047 (e.g., the Refueling Water Storage Tanks, the Primary Water Storage Tanks, the Gas House, the haul path and laydown areas, security barriers, buried commodities including those which serve the Intake Structure, and other interferences). Refer to PC/M 07-050 (Ref. IV.5.6) for removal/reinstallation of interferences.

The cask crane will be replaced under PC/M 07-048, "Demolition of Cask Handling Crane" and PC/M 07-049, "Turkey Point Cask Crane - New Single Failure-Proof Crane Installation" (Ref. IV.5.1 & IV.5.2). Modifications

needed to resolve interferences are addressed in PC/M 07-050 "Turkey Point Cask Crane - Crane and Support Structure Upgrade Interference Modification."

I.2. SSC Purpose/Function/Design Basis:

The purpose of the cask handling crane support structure is to provide adequate structural support to the crane under all operating and extreme environmental loading conditions. The existing support structure was designed for a 105-ton crane as a Class III SSC (UFSAR Appendix 5A) with static seismic load factors only. No dynamic analysis was performed. The cask handling crane is being replaced with a single failure-proof crane that is classified as Seismic Category I (Class I) Nuclear Safety Related. Therefore, the modified support structure for the new single failure-proof crane is also designed as a Class I SSC per the requirements of the UFSAR. The new cask crane support structure is designed to maintain structural integrity for handling fully loaded casks (130-tons max) under earthquakes and operating wind loadings. The cask crane support structure has also been designed to withstand the PTN design basis tornado wind load of 225 mph with no load and the crane parked and locked down at one of the two lockdown positions. Tornado missile loading has been considered per UFSAR, as described in Section I.8.12 of this PC/M.

I.3. Safety Classification: SR X QR ____ NNS ____

The existing cask crane and the support structure are classified as Quality Related per FPL Quality Instructions ENG-QI 2.6. However, the existing crane will be upgraded to Nuclear Safety Related and will meet the requirements of single failure-proof criteria of NUREG-0554 (Reference IV.5.4), for handling 130-ton casks. If the support structure design remained as Class III SSC (UFSAR Appendix 5A), it could collapse under seismic and/or tornado loading conditions and thus jeopardize the functionality of the upgraded single failure proof crane. Therefore, the entire support structure is being upgraded to Seismic Category I (Class I) and Nuclear Safety Related in order to provide adequate structural support to the crane under all postulated loading conditions.

All new materials will be procured as PC-1 or PC-2 and the existing components that will remain in the upgraded structure will be commercially dedicated as equivalent to Nuclear Safety Related (Reference IV.5.22).

I.4. Reason for Design Change: ITS X NITS ____

Based on the current inventory and the anticipated future generation of spent fuel at PTN, the spent fuel pools presently have adequate Full Core Offload (FCOL) reserve capacity for the storage of spent fuel until 2010 (U3) and 2012 (U4) (Reference IV.5.3). FPL has decided to implement an Independent Spent Fuel Storage Installation (ISFSI) for on-site storage of Spent Fuel in Dry Storage Canisters (DSC). As envisaged, the casks will be loaded with spent fuel assemblies inside the fuel pool area. Then the casks will be lifted out of the pool using the cask crane and placed in a cask handling facility where they will be prepared for transfer to the ISFSI facility. The existing cask crane is not single failure-proof and its 105/15-ton main/aux hook capacity is not adequate to handle the future casks. Therefore, the crane will be replaced with a new crane with 130/25-ton main/aux hook capacity. The new upgraded crane will meet the single failure-proof requirements of NUREG-0554. The crane will also be analyzed and designed for Seismic Category I (Class I) requirements. In order to support functionality of the upgraded single failure-proof crane described above, the support structure must also be upgraded to be Seismic Category I (Class I) and be able to withstand tornado wind loading requirements as a Class I SSC.

A detailed 3-D computerized analysis indicates that the current steel structure and its foundation need major upgrading to satisfy the design criteria (Reference IV.5.11) for Seismic Category I, Safety Related (Class I) SSC.

I.5. Design Change Description:

The proposed design change includes upgrade and modification of the cask crane support structure and foundations from Seismic II/I and Quality Related to Seismic Category I (Class I) and Nuclear Safety Related SSC. Additionally, the existing structure was designed for sustained operating wind (maximum speed 45 mph) but will be upgraded to resist 225 mph tornado wind loading.

The major modifications involved in this design change are described below.

I.5.1 Removal of Interferences

The cask crane support structure has been used for supporting many small bore pipes, conduits and other components at the grade level on the East side. Some of these items will create interferences to the installation of structural steel modifications described below. Therefore, temporary removal and/or replacement of the supports for these small bore pipes and conduits will be required. Other items that have been identified as potential interferences include the following: the guard rails on the west side of the Haul Road, Delay fence near the same area and pipes/conduit supports on the Auxiliary Building roof. Note that other interferences may also be identified during the field installation process. All modifications/changes required to SSCs other than the cask crane support structure will be covered under PC/M No. 07-050 (Reference IV.5.6).

I.5.2 East Side A-Frames Modifications

All of the drawings referred to below as Attachment IV.4.1 are included in Attachment 1. The two (2) multi-colored renderings (Figures FPL-080711-1 & FPL-080711-2) are included to provide an overview of the existing support structures and its surrounding SSCs; and the proposed modifications to the support structure and foundations.

Bents E 1 and E 6 (North and South Ends)

References: Attachment IV.4.1; Drawings 5610-C-1902/07-047, 5610-C-1903/07-047 (Shts. 1, 2, 3 and 4) and Calculations (Reference IV.5.7).

Superstructure: The vertical and inclined columns of the A-Frames at these locations will remain but will require major reinforcement and all the internal bracing members will be replaced. Existing anchorages need to be modified to resist the new design loads.

Foundations: The piers at the inclined columns are to be modified (as pile cap for the battered piles) to resist the lateral loads. A grade beam is provided between E1 & E2 to transfer the longitudinal loads to a set of eight battered piles located North of E1. Due to an existing duct bank between E5 and E6, the grade beam between E5 and E6 is discontinuous and a set of four battered piles are provided for each column. The orientation and the total number of piles remain the same.(refer to the 3D rendering-Attachment 1).

Bents E 2 and E 5

References: Attachment IV.4.1; Drawings 5610-C-1904/07-047 (Sht.5610-C-1903 1, 2, and 3), and Calculations (Reference IV.5.7).

Superstructure: The existing vertical and inclined columns of the A-frames shall remain but will require cover plates. All the existing bracing members inside the A-frames will be replaced. Additional lateral bracings to the East of the existing inclined columns of the A-Frames are required to resist the lateral loading.

Foundations: At E5 a set of four piles will be used for resisting vertical and horizontal loads. At E2, the vertical load will be taken by two vertical piles penetrating a minimum of 30'-0" into the existing Miami Oolite rock strata. This pile cap will be tied into the 2'-6" thick Haul Path to provide shear capability in the east-west direction. The pile cap at E2 will be installed in a manner so as not to interfere with the underground circulating water intake structure by straddling the Intake structure. Tying into the Haul Path does not affect the structural capability of the road. Also, the movement of the loaded cask on the Haul Path does not affect the proposed modifications to the structure (Reference IV.5.7).

Bents E 3 and E 4

References: Attachment IV.4.1; Drawings 5610-C-1902/07-047, and Calculations (Reference IV.5.7).

Superstructure: The proposed superstructure modifications are similar to those at locations of Bents E2 & E5.

Foundation: The foundation details at E3 is similar to that described for E2 and the modifications at E4 are similar to those described at E5 except that at E3 and E4 the existing vertical column does not require supplementary anchorage to the existing concrete pier as is required at E2 and E5 respectively.

I.5.3 West Side A-Frames and Wall Supports Modification

NOTE: The Foundations i.e., anchorages to the Auxiliary Building Roof for the Bents 2.7 and 3.6 are addressed by "Holdpoint" #1.

Revision of this EP removes the "Holdpoint" for Bent 4.4 in its entirety and the "Holdpoint" at the existing diagonal column of Bent 2.7, since construction efficient designs have been developed for these locations.

Bent 2.7

References: Attachment IV.4.1; Drawings 5610-C-1905/07-047 (Shts. 1 and 2), and Calculations (Reference IV.5.7).

Superstructure: Reinforcement to the existing inclined column above elevation 45'-0 and changes to the internal bracing are required. Also, a new additional brace to the east of the frame and new internal bracing is required in order to resist the revised lateral loads.

Foundation: The anchorage for uplift loads on the existing diagonal needs to be modified. The new brace requires attachment to Auxiliary Building walls to provide positive anchorage. The existing wall has been verified for the additional loading from the bent and found to be acceptable.

Bent 3.6

References: Attachment IV.4.1; Drawings 5610-C-1906/07-047 (Shts.1 and 2), and Calculations (Reference IV.5.7).

Superstructure: New additional lateral bracing will be located on the West side of the bent due to interferences on the East side. Changes to internal bracing members are also required.

Foundation: The additional load at the vertical column is directly transferred to the existing pier by anchorage to the shear wall below. The anchorage for uplift for the new diagonal brace is provided by drilling and epoxy grouting anchor rods into the 3'-6" thick Auxiliary Building wall below.

Bent 4.4

References: Attachment IV.4.1; Drawings 5610-C-1907, (Sht 1 thru 3) and Calculations (Reference IV.5.7).

Superstructure: Existing inclined column is reinforced with two WT-sections, one on each flange. Additional kicker and internal bracings are provided to the east of the bent to resist the revised design loads.

Foundation: Extensive detailed steel grillage with stub columns to the Auxiliary Building roof and anchorage to the walls below are provided to effectively transfer the revised superstructure loads.

Bents 1.1 & 1.9 and 5.2 & 6.1 (Auxiliary Building Wall Supports)

References: Attachment IV.4.1; Drawings 5610-C-1908/07-047 (Shts. 1 and 2) and Calculations (Reference IV.5.7).

Superstructure: Due to the increased loads both the vertical and inclined members are reinforced with cover plates. Also, the 3/8" x 6" connection plate between the rail girder and the frame is being replaced.

Foundation: These supports are directly supported on the upper elevation of East-West walls of the spent fuel building. The load transfer of the lateral crane girder support frames is achieved with plates on each side of the wall and through bolts connecting these plates. The wall reinforcing #9 @8" (drawing 5610-C-260 Sect. E & K) extends from elevation 58'-0" through the roof and into the support piers. Extensive shear reinforcing, #4 ties @ 8" spacing are provided so that proper transfer of the applied loads into the existing structural system is achieved.

I.5.4 Modification of Bracing Systems at 94' and 59'-6"

Reference: Attachment IV.4.1; Drawings 5610-C-1909/07-047 (Shts. 1, 2, and 3), -1910 & -1911 (Shts. 1 and 2), -1912 and Calculations (Reference IV.5.7).

Entire bracing system will be replaced due to overstress.

I.5.5 Crane Rail and Rail Clips

References: Attachment IV.4.1; Drawings 5610-C-1910/07-047 and Calculations (Reference IV.5.7).

The existing 104 lb rail and attachments to the rail girder are not adequate for the proposed new crane and wheel loads. The rail will be replaced with a 175 lb/yd rail and the crane-rail attachments will be replaced.

I.5.6 Attachment to Haul Path

References: Attachment IV.4.1; Drawing 5610-C-1913/07-047 and Calculations (Reference IV.5.7).

To resist the lateral forces in the East-West direction, the concrete pile caps at column locations E2 and E3 will be doweled into the existing 2'-6" thick reinforced concrete Haul Path.

I.5.7 Modification of Crane Rail Girders

References: Attachment IV.4.1; Drawings 5610-C-1909/07-047 (Sht. 1 and 2), and Calculations (Reference IV.5.7).

Existing horizontal trusses at top and bottom flanges of the crane rail girders (East and West) are being replaced with heavier sections. Additional trusses are added on the Auxiliary Building roof at North and South ends to transfer the lateral loads. Flange plates are added to the bottom flange of the West girder between the columns, starting in the mid-span and ending at 9'-0" from the center line of the columns.

I.5.8 Modifications per Inspection Report 29142-01

Reference: IV.5.12

Replacement of all the bolts at the expansion joint on both East and West plate girders.

Replacement of bearing pads recommended under the West plate girder support on Auxiliary Building walls at column locations W1.1, W1.9, W5.2 and W6.1. Also concrete cracks on the wall at these locations must be repaired. Damaged grout under base plates at column locations E2, E5 and E6 must be replaced.

Concrete and grout work shall be performed per Reference IV.5.18 and IV.5.27 respectively.

FPL will, during progression of the work, identify, characterize, assess and recommend appropriate remedy for all areas of structural degradation/corrosion found on the structural members to remain.

I.6. Design Change Checklist

Does the Design Change involve/impact/require justification of:

	YES	NO	REFERENCE
Accessibility/Laydown/Clearance Requirements	X		I.8.1
Air Operated Valve (AOV) Program		X	
ALARA Exposure Criteria	X		I.8.2 Form 71 (Attachment 9)
ASME Code		X	
B5b, "Beyond Design Basis Accident mitigation Strategies" (Reference NEI-06-12)		X	

* Forms 3E, 3F, 3G, 3H and 71 as applicable shall be attached to justify the conclusion for these items.

	YES	NO	REFERENCE
(PSL and PTN PC/Ms 07042, 07043,07024, and 07025) (If YES, CIRCLE applicable)			
Cable Tray Seismic Loading		X	
Cask Handling Crane(s) including Loading Ops, Crane Capacity	X		Explained in this PC/M
Coatings Inside Containment		X	
Containment Sump Debris Generation & Transport Analysis and/or Recirculation Functions		X	
Control Room Habitability/Systems/Envelope		X	
EDG/Battery Loading/Load Sequencing		X	
Electrical Equipment Grounding	X		I.8.3
Electrical Separation Criteria		X	
Emergency Lighting Criteria		X	
Emergency Planning		X	
Emergency Plant Operating Procedures (EOPs/ONOPs)		X	
Emergency Response Data System (ERDS)		X	
Environmental Criteria	X		I.8.4
Environmental Qualification*		X	Form 3E (Attachment 7)
Fire Protection Capability*		X	Form 3F (Attachment 3) & References IV.5..24, 25 and 26.
Functional Equipment Group (FEG)		X	
Functional Importance Determination (FID)		X	
Heat Sinks In Containment		X	
Heavy Load Handling, including Haul Paths, ISFSI Haul Paths	X		I.8.5
HELBA Criteria/Analyses		X	
Human Factors*		X	Form 3H (Attachment 6)
Hurricane/Tornado Wind Loading	X		I.8.6
Hydrogen Generation In Containment		X	
Independent Spent Fuel Storage Installation (ISFSI) Area impacts (e.g., grading, drainage, parking, Security)	X		Explained in this PC/M
Internal/External Flooding	X		I.8.7
Instrument Setpoints		X	
Insulation within the containment		X	
License Renewal SSCs*	X		Form 3G (Attachment 4)
Loads Applied to Existing Structures (+ buried)	X		I.8.8
Masonry Block Wall Interaction		X	
Material Compatibility/Hazardous Materials	X		I.8.9
NML Property Insurance Requirements		X	
Paging System Audibility		X	

	YES	NO	REFERENCE
Plant Security Capability	X		I.8.10
Safe/Alternate Shutdown Capability*		X	
Seismic Interaction	X		I.8.11
Seismic Qualification	X		I.8.11
Single Failure Criteria		X	
Single Point Vulnerability (SPV)		X	
Susceptibility to electromagnetic and radio-frequency interference, surge or electromagnetic discharge		X	
Thermal/Hydraulic Performance		X	
Tornado/Internal Missiles	X		I.8.12

I.7. Design Evaluation/Justification

Design Evaluation

Wheel loads from the new crane resulting from dead load, operating wind, hurricane wind, tornado wind, and impact loads from crane operation, developed and combined in accordance with the requirements of ASME NOG-1 (Reference IV.5.9), were generated and used as input for support structure analysis. These wheel loads were applied at the top of the runway girder rail at selected critical locations to maximize the forces on the support structure members. Dynamic analyses were performed (Reference IV.5.8) for the applicable seismic conditions. The controlling seismic responses of the various elements of the mathematical model were determined considering seven main hook and one aux hook configurations that reflect various placements of the bridge, trolley, and loaded hook in up or down positions. For each configuration thirty-two load combinations were considered as representing all load combinations required by the licensing design basis.

The combined mathematical model included all the structural steel members starting at the crane rails and extending downward to the base plates of the Columns and A-Frames. The base plate to foundation connections are considered fixed, per drawings and field verification. The Auxiliary Building roof, walls, and floor are modeled as plate elements to represent the overall stiffness effects of the building. The ground response spectra were used for seismic input. The bracing system replacement is mostly due to the results of the seismic analysis.

An equivalent static analysis was performed for the tornado wind loading, with wind velocity of 225 mph on the structure, including the crane rail girders. The lateral bracing at the bents (east and west) were necessary to resist the tornado wind loading.

The modification involves removal of many members of the A-Frames and the entire bracing system at elevations of 59'-0" and 94'-6". The process of installation is so designed that during installation every interim configuration is evaluated for stability under earthquake loading per Seismic II/I requirement and the operating wind loading, which is the current design basis (Reference IV.5.10).

Justification

This proposed modification upgrades the cask crane support structure from a Seismic II/I to Seismic Category I (Class I) SSC. It also qualifies the structure for tornado wind loading in addition to the operating wind loading of the existing design. The support/interface systems involve the Auxiliary Building on the west side and the isolated footings on the east side. The detailed structural analysis shows that the effects on the Auxiliary Building due to the increased loading from the upgraded support structure are minimal, and functionality and operability of any equipment inside and/or on the roof are not affected either during the installation or after the installation. The East side foundations are modified for the revised loading as described in Section I.5 and shown on the attached drawings., thus maintaining the bearing pressures of the supporting subgrade within the design basis limits (Reference IV.5.11).

The analysis was performed utilizing industry accepted methodology and per analytical methodologies described in the UFSAR.

Therefore, this modification, since it involves the upgrade of an existing passive structure and has no adverse effects on the plant functionality and operability or safe shutdown capability, can be implemented.

Design/Operability Reference Guide Review

This design change poses no additional design, safety and/or regulatory considerations since all design has been performed in accordance with design bases and none of the active SSCs required for plant operation or safe shutdown of the plant are affected and it can be implemented without prior NRC approval (Ref. Attachment 2).

I.8. Evaluation of any "YES" responses in Design Change Checklist

I.8.1 Accessibility/Laydown/Clearance Requirements

This installation may be performed during plant operation. Thus, accessibility and laydown of the structural steel members and the mobile crane to install them safely has been a very important consideration. Erecting the east side frames and bracings are relatively less complicated, since the area of installation is easily accessible via a mobile crane parked on the heavy Haul Road. However, for the A-Frames and bracing systems on the west side, the clearances for installation and the available laydown areas on the roof of the Auxiliary Building, due to numerous existing SSCs on the roof, are both critical and must be chosen carefully (refer to the suggested Installation sequence in Attachment #12 for details). A constructability/erectability/rigging workshop was held for this purpose and it was concluded that if all of the proposed procedures for installation are properly implemented, installation of this modification is feasible, without any effects on the plant functionality and operability. During the walkdown, the transport route and laydown of all construction vehicles was also evaluated by visual inspection only. No actual physical measurements were considered essential.

I.8.2 ALARA Exposure Criteria

The cask crane support structure is located in the RCA. Therefore, the possibility exists for an exposure to radiation. However, the dose limits are extremely small and it is believed that little or no dose will be experienced by the workers associated with the installation of this PC/M.

Refer to the ALARA Review Form (Form 71) attached to this PC/M.

I.8.3 Electrical Equipment Grounding

Existing grounding system as shown on Drawing 5610-E-301: "Grounding Notes, Symbols and Details," shall be maintained. If the existing grounding system must be disturbed temporarily (e.g., to facilitate the installation of replacement and/or reinforcement to existing structural steel members), the original conditions shall be restored promptly.

I.8.4 Environmental Criteria

This design attribute is applicable only if field application of painting/coating is required. All structural steel frames/members will be fabricated and painted/coated/galvanized in the shop per SPEC-C-099 (Reference IV.5.15). If any field touch-up is required, it will be performed per FPL Specification C-004 (Reference IV.5.16). Thus, the environmental effect, if any, will be minimal.

I.8.5 Heavy Load Handling

Regulatory Requirements:

All heavy loads (>1,760 lbs. at PTN) will be handled per NUREG-0612 (Reference IV.5.20). In accordance with NUREG-0612, heavy load handling may be performed under the following two conditions:

- to show that the probability of load drop is extremely low or
- to perform a load drop analysis to show that the consequence of load drop does not affect plant safety.

The first approach was adopted for this modification, i.e., all loads will be handled per Turkey Point heavy load handling procedures that implement the requirements of NUREG-0612. Per NUREG-0612, this may be achieved by providing either redundant rigging with a safety factor of 5:1 on each of the riggings or a single rigging with a safety factor of 10:1. Note that the safety factor is defined as "the ratio of ultimate capacity to nominal working capacity or rated load for the rigging." This will ensure that the probability of load drop is minimal and no load drop analysis is required. Since most of the structural steel members to be replaced are heavy loads per PTN limits, and since the worst mode of load drop must be considered as required by NUREG-0612, load drop analysis is not the appropriate approach for this installation. Therefore, the Regulatory Requirements of NUREG-0612 for heavy load handling will be met by ensuring that the probability of load drop is extremely low.

It may be noted no NRC-mandated regulatory requirements exist for mobile cranes. General practice is to use a higher capacity crane with inspections, operator training and other guidance per NUREG-0612, Section 5.1, to make the mobile crane operation as reliable as possible to ensure that the probability of load drop is extremely low. A mobile crane with adequate lifting capacity, maximum boom length and boom angle like Grove GMK4090, or equivalent will be used for the installation in the East side; and LTM 1150-5.1 or equivalent will be used for the West side. In addition to NUREG-0612, all rigging shall meet the requirements of 0-ADM-726 (Reference IV.5.21). Movement of the boom will be administratively controlled; e.g., not going over RWST and PWST, area of spent fuel pool containing spent fuel or any identified Safety Related SSCs in the area of installation.

PTN commitments and Administrative Procedures:

In response to NUREG-0612 requirements, PTN prepared Procedure 0-ADM-717, "Heavy Load Handling" (Reference IV.5.5) that provides the guidelines for handling heavy loads at the site. Attachment 1 of 0-ADM-717 provides the areas of restrictive load handling. In accordance with these limits, the roof of the Auxiliary Building is restricted for any loads greater than 5-tons and no loads greater than 2000 lbs. can be handled over the spent fuel pools. In addition, the area that contains the Refueling Water Storage Tanks (RWSTs), the Primary Water Storage Tanks (PWSTs), and the Gas House is restricted to 1,760 lbs by Procedure 0-ADM-717. The limits over the spent fuel pools will be met by Administrative controls imposed in the Installation Procedure . The cask crane upgrade installation should be reviewed against the requirements of Procedure 0-ADM-217 (Reference IV.5.13), since it is "not specifically covered by existing plant procedures." Attachment 9 of 0-ADM-717 designates the entire area of the RWST and PWST tanks as "restricted for loads greater than 1760 pounds to be lifted with mobile crane/hoisting rig." The figure in Attachment 9 does not recognize the distance between tanks, where the A-Frames on the east side of the cask crane support structure are located and heavy loads will be lifted in these areas and not over the tanks.

Note that 0-GMM-102.18, "Implementation Procedure for Heavy Hauls" (Reference IV.5.14) will not be required for this PC/M since "loads greater than 165,000 pounds (Gross Vehicle Weight)" will not be "transported on east, south and west plant roads" for this modification. It is estimated that Gross Vehicle Weight (GVW) for this installation will be less than 165,000 pounds. However, if a heavier (dead load) mobile crane is selected and the combined structural steel component/mobile crane weight exceeds 165,000 pounds, procedure 0-GMM-102.18 will be adopted.

I.8.6 Hurricane/Tornado Wind Loading

The governing hurricane wind speed considered for this design change is 150 mph (Reference IV.5.11). Although the crane is required to be parked and locked at either end with a forecasted hurricane conditions, the upgraded structure is satisfactory for the sustained hurricane wind loading. Hurricane wind loading is not considered during installation, since no installation is proposed during hurricane conditions. This will be administratively controlled in the Installation Procedure.

Tornado wind loading with maximum wind speed of 225 mph has been considered in the analysis of the support structure. However the live load due to the cask is not added to tornado loading, since "there will be sufficient time after sighting a tornado to remove significant live loads such as loads on cranes" (Reference: UFSAR Section 5A-1.3.5).

I.8.7 Internal/External Flooding

The entire support structure including the foundations are outside the plant structures and will not be affected by any internal flooding. External flooding will have no effects on this modification, specifically, the isolated spread footings on the East side, since additional concrete mass and piles (with 180 tons tension capacity) are added for each isolated footing.

I.8.8 Loads Applied to Existing Structures (+ Buried)

Above-Ground SSCs:

The only existing structures affected by this PC/M are the Auxiliary Buildings (Unit 3 and Unit 4), the RWST and PWST tanks and the Gas House. The Auxiliary Building walls have been checked for the additional tension and shear loads and found to be acceptable (Reference IV.5.7). The walls are considered acceptable for the additional compression loading as well, as indicated in Reference IV.5.7. The other SSCs mentioned will have no additional superimposed loads.

Buried Structures/Utilities:

The haul road for the future movement of a loaded cask handling vehicle has been evaluated for the ISFSI project (Reference: PC/M 06-011, drawing No. FPL012-Sk-008). Most of the proposed haul path for this PC/M (Reference Attachment #11) has been qualified for the loads imposed by cask handling vehicle for the ISFSI project except for the road between the Auxiliary Building and the East side A-frames of the cask support structure. The imposed loads on the ground/road surface and underground utilities for this installation are enveloped by those of the loaded cask handling vehicle (References: ISFSI Heavy Haul path Evaluation calculation No. FPL012-CALC-015 and Engineering Evaluation No. PTN-ENG-SECS08-035). Therefore, all utilities under the haul road proposed for ISFSI vehicle including the East Heavy Haul Road are qualified for the imposed loading by the mobile crane/steel components during installation of this design change. However, underground utilities below the road between the Auxiliary Building and East side A-frames, mobile crane travel path and outrigger locations have been evaluated in an Engineering Evaluation (Reference IV.5.23) for the selected mobile crane for this installation. Per Reference IV.5. 23, the pipe trench located between Bents E 2 and E3 (currently covered with ¼" checker plate, stiffened by angle 2" x 3" x ¼") is inadequate for the LTM 1250-6.1 mobile crane wheel load. The pipe trench must be covered with 1 ¼ " thick steel plate for this load (static or moving). The trench has not been checked for the outrigger loads, since the crane cannot be staged at this location with the pedestal proposed by the vendor.

GPR will be used to determine existence of underground utilities, prior to any excavation. To avoid deep excavations at the footings of the A-frames, micro piles (vertical and battered) are to be utilized. The piles at all locations are installed using micropile technology,, precluding vibratory motions imposed on the Intake Structure or any other underground utilities by pile driving machinery. The piles will be installed to a depth into the rock stratum required to resist the uplift forces. Since the load is transferred directly to the rock below, it has negligible effect on the Intake Structure or any other underground utilities, per review of existing plant drawings (Reference drawing 5610-C-1922/07-047).

I.8.9 Material Compatibility/Hazardous Materials

All the materials specified for the new structural steel and miscellaneous members/components are compatible with the existing materials (References IV.5.15, IV.5.17 and IV.5.18) and are procured as PC-1 or PC-2. Any members/components remaining in the final configuration of the support structure will be dedicated to PC-1or PC-2 requirements per the Dedication Report (Reference IV.5.22). Minor items like paint etc may be procured as PC-3.

I.8.10 Plant Security Capability

A portion of the delay fence shall be temporarily removed to facilitate the installation of foundation on the east side along the ISFSI haul road. The delay fencing is a NNS-related component and is not associated with any power generation functions or active plant equipment. Therefore, the temporary removal of the fencing does not have the potential to adversely affect any plant safety-related SSCs. Whenever delay fence is removed, every reasonable effort shall be made to replace with temporary fencing or other equipment that can be used as a temporary barrier. If this cannot be done, Security must evaluate to determine if compensatory actions are required.

I.8.11 Seismic Qualification/Seismic Interaction

Seismic Qualification:

The existing cask crane support structure is a Class III SSC and has been evaluated for Seismic II/I requirements. This categorization does not require that the structure be operational during or after a design basis earthquake. However, the structure has been evaluated to ensure that it will not collapse under the earthquake loading and affect any Class I SSC (e.g., the Auxiliary Building). The upgraded structure will be

Seismic Category I (Class I). As a result, the new support structure will be seismically qualified to remain functional during and after a design basis earthquake.

Seismic Interaction:

Since the cask crane support structure is upgraded to a Seismic Category I (Class I) SSC, a collapse under design basis earthquake (SSE) loading is not postulated. Therefore, seismic interaction is not feasible.

I.8.12 Tornado/Internal Missiles

The following is a basis to conclude that the Cask Crane support structure as designed comply with the tornado missile bases described in the UFSAR:

4'x8' Corrugated Sheet of Siding: The impact energy of this missile will be absorbed in the deformation of the missile itself and the stored strain energy of the target support member. Therefore, the missile will cause no credible damage to the crane or the support structure and no catastrophic structural failure is predicted.

12'x4'x4" Bolted Wood Decking: This missile is a high kinetic energy missile. However, the UFSAR has no mention of orientation of the impact geometry. It is reasonable to assume that the missile is expected to strike the support structure in a random orientation at any height. It is also reasonable to assume that a single member impact be considered the worse case since a joint or main A-frame is structurally more robust. An impact to a joint would result in significant damage. It is postulated that substantial local damage could occur to a single member such that failure of that single member would result. However, failure of any one member by itself will not cause a catastrophic structural failure.

Passenger car (on the ground): By visual inspection of the site general arrangement, most of the crane support structure is protected from a direct impact of a passenger car tumbling on the ground by buildings and other structures in the vicinity of the support structure. Those members not protected by buildings or structures have specific ballards or a similar type barrier which will absorb a large portion of the impact energy of the car missile. These protective structures will dissipate sufficient amounts of energy such that any subsequent impact to the support structure will not have enough magnitude to cause significant damage or result in a catastrophic structural failure of the crane support structure.

Internal Missiles

Per 5610-000-DB-001, Sect XIII (Selected Licensing Issues), internal missiles are associated with systems containing significant amounts of kinetic or potential energies like high pressure fluid system or rotating equipment. All of these sources are within the power block and all potential internal missiles are prevented by barriers/shields to prevent them from flying outside of the buildings and/or structures. Therefore, no internal missiles need be considered for the cask crane support structure.

I.9. Design Verification Statement

The design basis was reviewed against the DBDs, UFSAR, Technical Specifications, 10CFR50, and Engineering Quality Instructions to ensure that the design considered all applicable codes, standards and regulatory requirements.

The upgraded cask crane support structure was evaluated to ensure proper sizing (for stresses) and use of compatible materials. In addition, a review of the crane design inputs and analytical methodology verified the structural/seismic design analysis. Any assumptions used in the design are adequately described and are reasonable. The design inputs were properly selected using the latest revisions of drawings and other references and were correctly incorporated into the design.

Changes to the UFSAR have been identified and documented in a UFSAR Change Package (Attachment 8). No changes are required to be made to the Technical Specifications since no load greater than 2000 lb will be carried over spent fuel in the pool by administrative controls of the load path during the removal and installation of the heavy steel members. The Safety Classification was verified against the UFSAR and the requirements of ENG-QI 2.6, "Safety Classifications."

The impact of this modification on existing Safety Evaluations and other design modifications pending or in progress was initially verified by review of the PC/M Log, Safety Evaluation Log and Passport in February, 2008. It will be reviewed again. Qualified engineers working in the structural discipline of WGInt performed design verification for the structural discipline. An independent verification was performed for the methodology, the correctness of analysis inputs, verification of components design, etc. An independent third party review was also performed. Accordingly, the design verification meets the criteria established in ENG-QI 1.7.

This design change does not involve any special coatings, welding outside the guidance of the FPL Weld Manual, NDE, ASME Section XI (ISI) or equipment in corrosive environments. The fabricator of the structural steel will submit their welding procedure to FPL for approval (Reference IV.5.15). All coating will be performed per FPL Specification SPEC-C-004 (Reference IV.5.16). No active plant SSCs involved in the ISI program are affected by this PC/M.

An Engineering Evaluation has been prepared per ENG-QI 2.0 to dedicate the upgraded cask crane support structure as a Seismic Category I, Safety-Related (Class I) SSC (Ref. IV.5.22).

II. SAFETY

NOTE:

This PC/M contains the following "Holdpoint":
Auxiliary Building Roof Anchorages at Bents W 2.7, W 3.6.

Revision 1 of this PC/M releases the "Holdpoint" for Bent 4.4 in its entirety and the "Holdpoint" at the existing diagonal column of Bent 2.7, since construction efficient designs have been developed at these locations.

WGInt Actions required for this "Holdpoint" are:

1. Develop suitable construction efficient designs at the two bents capable of withstanding the reaction loads calculated in calculation FPL001-CALC-001 Rev 1.

2. Revise steel drawings to include details of the new anchorage designs including the anchor bolt details.

3. Revise concrete drawings to include details of concrete removal and new concrete/grout bedding for the new anchorages.

4. Revise concrete calculation FPL001-CALC-002 Rev 1 to qualify the new anchorage designs.

Release: This "Holdpoint" can be released by:

1. FPL review and acceptance of the documents discussed for revision above.

2. WGInt revising this PC/M by revision or Change Request Notice (CRN).

II.1. Description and Purpose

The existing fuel cask crane is not a single failure-proof design. It is designated as Seismic II/I, Quality Related. The existing cask crane support structure has been evaluated for Seismic II/I only. In addition, since the crane is parked at the lock-down position on the rail girder for any hurricane or high wind warnings, the support structure has been designed for operating wind load only. The existing crane and its support structure have not been evaluated for, or protected against tornado missiles.

The crane will be upgraded to Nuclear Safety Related meeting the requirements of single failure-proof per NUREG-0554 for the ISFSI project. Therefore, the support structure must also be upgraded to perform under all design basis loads, since its failure will jeopardize the functionality and operability of the new safety related crane. The upgraded support structure is designed as Seismic Category I (Class I) in order to remain functional during and after an SSE. It is also capable of withstanding tornado wind loadings. Tornado-generated missiles are considered for this upgrade, per UFSAR, as described in Section I.8.12 of this PC/M.

Cask handling will be performed in the north and south bays only, so this upgrade is essential for the north and south bays. The three (3) intermediate bays might remain as Seismic II/I and Quality Related. However, since the entire support structure is continuous and integral, the entire support structure is qualified as Seismic Category I (Class I).

Implementation of this PC/M will not require prior approval from the NRC and it will be performed under 10CFR50.59 Applicability/Screening (Attachment IV.4.2). The PTN cask crane support structure is a unique structural support system designed to meet the PTN requirements to handle casks using a single crane for both the units.

This PC/M performs the demolition and installation of the support structure members found to be unsuitable (either overstressed per the detailed 3D structural model analysis of the combined crane and support structure or due to excessive degradation). This design change enhances the safety and operability of the plant by providing an upgraded support structure for the cask crane.

II.2. Analysis of Effects on Safety

Safety Classification: The design change modifies the cask crane support structure (currently designated as Quality Related) and upgrades it to Nuclear Safety Related. Currently, the structure is Seismic II/I. It is not required to remain functional during and after an SSE but its design assures that it will not collapse under an SSE. As a result, the existing cask crane and its support structure cannot adversely affect any Class I SSCs or functions. However, since this structure will be providing support to the upgraded Nuclear Safety Related cask crane, its performance under all design bases load conditions must be assured. Therefore, the support structure is being qualified as Seismic Category I (Class I). This assures that the cask crane remains functional during and after an SSE and also maintains structural integrity under tornado wind loading. This upgrades the support structure to Safety Related and enhances the safety of the plant by precluding failure under all design bases loading.

Justification: Postulated failure of the support structure could result in the failure of the crane. The failed crane could adversely affect the Auxiliary Building and other Nuclear Safety Related SSCs and functions in its vicinity. As a result the support structure must be upgraded to perform under all design bases conditions.

This design change involves installation of upgrades to the cask crane support structure. The existing support structure, which is a passive Seismic II/I, Quality Related SSC is not required for safe operation or safe shutdown of the plant. However, it is designed so that it cannot lose structural integrity following a design basis seismic event. This assures that the support structure cannot adversely affect Nuclear Safety Related SSCs and required functions. Also, all heavy loads will be handled per Turkey Point heavy load handling procedures that implement the requirements of NUREG-0612.

All materials selected for this installation, such as structural steel, concrete, high strength bolts, etc., are suitable for their intended use. They will be compatible with the existing materials. All the structural steel materials will be procured as PC-1 or PC-2 and concrete will be procured as PC-2. This installation will have no effects on the materials in the existing plant stores.

II.3 Design Integration Review.

The following PC/Ms are part of the overall Cask Crane Upgrade Project. These PC/Ms will be coordinated with this PC/M as follows:

PC/M 07-048, Removal of existing Whiting Crane: the existing 105/15 ton non-single-failure-proof crane will be upgraded to a 130/25 ton single failure-proof crane. This PC/M involves the process of removal of the existing crane in accordance with plant procedures and regulatory requirements regarding heavy load handling and other applicable criteria. The single-failure-proof crane is being manufactured by ACECO and will also be installed by ACECO.

PC/M 07-049, Installation of New Single-Failure-Proof Crane: The new crane can only be installed after the existing crane is removed and all the post-modification verifications are complete. The installation will be performed by the manufacturer, ACECO, in accordance with the installation procedure delineated in PC/M 07-049, conforming to regulatory and plant procedures.

PC/M 07-050, Removal of Interferences: The modifications proposed under the current PC/M cannot be installed as designed, since there are numerous interferences in the way. Most of the above ground interferences are small bore piping and conduits at the grade level on the East crane structure and walls of the Auxiliary building. A GPR investigation will be performed to identify any underground interferences/utilities that may exist that are not identified on plant documentation. Note that removal of interferences must be completed prior to the installation of the structural modifications. Thus PC/Ms 07-047 and 07-050 must be coordinated closely.

PC/M 07-058, Modification to Unit 3 & 4 RWST Purification Pump Drain Lines: This modification utilized the cask crane support structure (Bent E 3) to support the lines. Temporary support will be provided to facilitate the installation of this PC/M and the existing support will be re-installed after the completion of the current modification. PC/M 07-050 will be coordinated with PC/M 07-058.

II.4 Failure Modes and Effects Analysis (FMEA)

Heavy load handling during installation will be performed in accordance with NUREG-0612; (i.e., either redundant rigging will be provided with a 5:1 factor of safety or a single rigging with a factor of safety of 10:1 will be provided). This capability, in conjunction with the application of administrative (procedural) controls, will minimize the probability of load drop. Therefore, no load drop analysis needs to be performed. The entire support structure will be classified as Nuclear Safety Related after the installation is complete. Therefore, after the installation is complete, no failure of the support structure is postulated under any design bases loading conditions. Structural integrity shall be maintained during the process of installation also, i.e., all interim configurations during the installation are verified to be structurally stable under construction loading (Ref. IV.5.10) and no failures are postulated
Thus, the risk to the plant from this modification is extremely negligible and a detailed FMEA (per ENG-QI 2.8) is not considered necessary.

II.5. Plant Restrictions

The cask crane will be used in the future for handling the spent fuel storage and transport casks, as well as maintenance and plant operational tasks. These casks are loaded with spent nuclear fuel bundles in the spent fuel pools. The cask crane support structure is a passive SSC and provides structural support to the crane. This Class I support structure assures its structural integrity during and following an SSE and has no effects on the operation of the plant. Since the upgraded design will assure both structural and functional capability, no design-related plant restrictions are applicable to this design change.

During the implementation of this PC/M, the following minor restrictions with no effects on the operation of the plant, shall be required:

- No work shall be performed at the Auxiliary Building Roof Anchorages at Bents W 2.7, W 3.6 and W 4.4 under this PC/M, in accordance with the "Holdpoint" described above.
- The haul road on the east side between bents E2 and E5 may be blocked off temporarily for the installation of the new concrete foundations.
- The cask handling crane will be parked at the north or south end while working on the other half of the span respectively and will not be available for any maintenance activities during the period of this modification.
- The delay fence along the west end of the haul road will be temporarily removed for concrete foundation work in the area during the period of actual work only.
- Safe load handling path shall be defined and must be followed (Reference Section VI of this PC/M).

These restrictions do not require any safety trains to be off or any operator actions.

II.6. Conclusions

UFSAR Section 9.5 describes the fuel cask handling crane but does not discuss the crane runway or its support structure, nor is the crane support structure mentioned elsewhere in the UFSAR or in the Technical Specifications. The original crane support structure was designed and installed as a Class III SSC. The proposed modification will upgrade the support structure to a Seismic Category I (Class I) Safety Related SSC. The proposed modification is an enhancement of the support structure and will not affect the operation or functionality of any safety related SSCs.

Load handling during installation will be performed per defense in depth guidelines of NUREG-0612 and load drop probability is considered to be minimal during the process.

Existing underground commodities and/or the Intake Structure are not adversely affected by the proposed activity. The calculation (Reference IV.5.7) showed that the increased loads on the Auxiliary Building, as a result of the design modifications, are acceptable.

This installation is an enhancement of a passive SSC not required for plant operation or plant safe shutdown. It will not result in any degradation, either directly or indirectly, to any Nuclear Safety related SSCs or functions required for analyzed accidents. The implementation of this modification does not increase any radiological consequences.

This modification requires minor changes in the UFSAR and no change to the Technical Specifications.

Since this installation has no effect on the safe operation or safe shutdown of the plant and all questions on the safety review of 10CFR50.59 (Attachment IV.4.2) received a "no" answer, this modification will be performed under a 10CFR50.59 Applicability/Screening and does not require prior NRC approval.

III. 10CFR50.59/10CFR72.48

III.1 Effects of the Design Change on the Technical Specifications

The Technical Specifications do not include any description and/or functions of the cask handling crane or the support structure. However, the Technical Specification 3/4.7.7 restricts movement of any load greater than 2000 lbs. over spent fuel assemblies in the spent fuel storage pool. This PC/M will not involve movement of loads exceeding 2000 lbs over the spent fuel pool by administrative control. This activity complies with the Technical Specifications.

III.2 Effects of the Design Change on the UFSAR

By administrative controls, as delineated in the Installation Procedure, installation of this PC/M will not involve handling loads in excess of 10,000 lbs. over the Auxiliary Building and no load greater than 2000 pounds to be handled over fuel in the spent fuel pool (Reference IV.5.5). Additionally, the mobile crane that supports the implementation of this PC/M will satisfy the general guidelines of NUREG-0612 Section 5.1 requirements for heavy load handling. All load handling devices will either have redundant rigging (5:1 safety factor) or a single rigging with a 10:1 safety factor and all defense-in-depth steps shall be utilized. As a result, the probability of load drop will be minimal. The use of a mobile crane in implementing this PC/M will meet the requirements of the Turkey Point procedures that implement the guidelines of NUREG-0612 for heavy load handling operations. This will include the application of administrative controls as well as defense-in-depth measures detailed in Section 5.1 of NUREG-0612. Thus this PC/M will be performed in conformance with the Technical Specifications and the design and licensing bases presented in the UFSAR. An UFSAR upgrade will be performed to include the Cask Handling Crane support structure in the list of Class I SSCs.

III.3 Conclusions

A 10CFR50.59 Applicability/Screening (Attachment IV.4.2) concluded that this installation does not introduce an unreviewed safety issue. It does not adversely affect any SSCs required for either safe operation of the plant or safe shutdown of the plant. Therefore, a 10CFR50.59 Evaluation is not required, and prior approvals from the NRC will not be required for the implementation of this PC/M.

IV. CONFIGURATION

IV.1. Affected Document Checklist

	YES	NO	Reference
FSAR	X		
Technical Specifications		X	
TEDB		X	
Security Plan	X		Note (1)
DBDs		X	Note (2)
Snubber List		X	
ISI/IST Program (If "Yes", CSI review is required)		X	
Code Stress Reports		X	

Note (1): Refer to Sect. 1.8.10
Note (2): Reviewed DBD 5610-000-DB-001, Sect II. No changes are required to this document.

IV.2. Affected Drawings

PC/M DRAWING NO.	REV.	DESCRIPTION/TITLE	DISC.	AFFECTED PLANT DWGS	REV.	PRIORITY	EP REV.
5610-C-1901 /07-047	1	STRUCTURAL STEEL TYPICAL STEEL DETAILS AND GENERAL NOTES	C	5610-C-1901	0	N/A	1
5610-C-1902 /07-047	1	STRUCTURAL STEEL PLAN VIEW	C	5610-C-1902	0	N/A	1
5610-C-1903 SH. 1 /07-047	1	STRUCTURAL STEEL BENTS 1 AND 6 MODIFICATION TO EXIST. STRUCTURE SECTIONS AND DETAILS	C	5610-C-1903 SH. 1	0	N/A	1
5610-C-1903 SH. 2 /07-047	1	STRUCTURAL STEEL BENT 6 MODIFICATION TO EXIST. STRUCTURE SECTIONS AND DETAILS	C	5610-C-1903 SH. 2	0	N/A	1
5610-C-1903 SH. 3 /07-047	1	STRUCTURAL STEEL BENTS 1 AND 6 MODIFICATION TO EXIST. STRUCTURE SECTIONS AND DETAILS	C	5610-C-1903 SH. 3	0	N/A	1
5610-C-1903 SH. 4 /07-047	1	STRUCTURAL STEEL BENTS 1 AND 6 MODIFICATION TO EXIST. STRUCTURE SECTIONS AND DETAILS	C	5610-C-1903 SH. 4	0	N/A	1
5610-C-1904 SH. 1 /07-047	1	STRUCTURAL STEEL BENTS 2, 3, 4, AND 5 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1904 SH. 1	0	N/A	1
5610-C-1904 SH. 2 /07-047	1	STRUCTURAL STEEL BENT 5 MODIFICATION TO EXIST. STRUCTURE SECTIONS AND DETAILS	C	5610-C-1904 SH. 2	0	N/A	1
5610-C-1904 SH. 3 /07-047	1	STRUCTURAL STEEL BENT 2 MODIFICATION TO EXIST. STRUCTURE SECTIONS AND DETAILS	C	5610-C-1904 SH. 3	0	N/A	1
5610-C-1905 SH. 1 /07-047	1	STRUCTURAL STEEL BENT 2.7 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1905 SH. 1	0	N/A	1
5610-C-1905 SH. 2 /07-047	1	STRUCTURAL STEEL BENT 2.7 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1905 SH. 2	0	N/A	1
5610-C-1905 SH. 3 /07-047	1	STRUCTURAL STEEL BENT 2.7 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1905 SH. 3	0	N/A	1
5610-C-1906 SH. 1 /07-047	1	STRUCTURAL STEEL BENT 3.6 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1906 SH. 1	0	N/A	1
5610-C-1906 SH. 2 /07-047	1	STRUCTURAL STEEL BENT 3.6 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1906 SH. 2	0	N/A	1
5610-C-1906 SH. 3 /07-047	1	STRUCTURAL STEEL BENT 3.6 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1906 SH. 3	0	N/A	1
5610-C-1907 SH. 1 /07-047	1	STRUCTURAL STEEL BENT 4.4 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1907 SH. 1	0	N/A	1

5610-C-1907 SH. 2 /07-047	1	STRUCTURAL STEEL BENT 4.4 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1907 SH. 2	0	N/A	1
5610-C-1907 SH. 3 /07-047	1	STRUCTURAL STEEL BENT 4.4 MODIFICATION TO EXIST. STRUCTURE AND NEW BRACING - SECTIONS AND DETAILS	C	5610-C-1907 SH. 3	0	N/A	1
5610-C-1908 SH. 1 /07-047	1	STRUCTURAL STEEL BENTS 1.1 - 1.9 - 5.2 - 6.1 MODIFICATION TO EXIST. STRUCTURE SECTIONS AND DETAILS	C	5610-C-1908 SH. 1	0	N/A	1
5610-C-1908 SH. 2 /07-047	1	STRUCTURAL STEEL BENTS 1.1 - 1.9 - 5.2 - 6.1 MODIFICATION TO EXIST. STRUCTURE SECTIONS AND DETAILS	C	5610-C-1908 SH. 2	0	N/A	1
5610-C-1909 SH. 1 /07-047	1	STRUCTURAL STEEL TRUSS ASSEMBLY AT EL. 94'-6" PLAN AND SECTIONS	C	5610-C-1909 SH. 1	0	N/A	1
5610-C-1909 SH. 2 /07-047	1	STRUCTURAL STEEL TRUSS ASSEMBLY AT EL. 94'-6" PLAN AND SECTIONS	C	5610-C-1909 SH. 2	0	N/A	1
5610-C-1909 SH. 3 /07-047	1	STRUCTURAL STEEL GRATING-HANDRAILS-LADDERS AT EL. 94'-6"	C	5610-C-1909 SH. 3	0	N/A	1
5610-C-1910 SH. 1 /07-047	1	STRUCTURAL STEEL CRANE RAIL - CRANE STOP - RAIL CLIPS - PLAN, SECTIONS AND DETAILS	C	5610-C-1910 SH. 1	0	N/A	1
5610-C-1910 SH. 2 /07-047	1	STRUCTURAL STEEL CRANE LOCK - PLAN, SECTIONS AND DETAILS	C	5610-C-1910 SH. 2	0	N/A	1
5610-C-1911 SH. 1/07-047	1	STRUCTURAL STEEL TRUSS ASSEMBLY AT EL. 59'-0" PLANS AND SECTIONS	C	5610-C-1911 SH. 1	0	N/A	1
5610-C-1911 SH. 2/07-047	1	STRUCTURAL STEEL TRUSS ASSEMBLY AT EL. 59'-0" PLANS AND SECTIONS	C	5610-C-1911 SH. 2	0	N/A	1
5610-C-1912 SH. 1 /07-047	1	STRUCTURAL STEEL UNIT 4 SPENT FUEL BLDG. ROOF BRACING AT EL. 84'-0" SECTIONS AND DETAILS	C	5610-C-1912 SH. 1	0	N/A	1
5610-C-1912 SH. 2 /07-047	1	STRUCTURAL STEEL UNIT 4 SPENT FUEL BLDG. ROOF BRACING AT EL. 84'-0" SECTIONS AND DETAILS	C	5610-C-1912 SH. 2	0	N/A	1
5610-C-1913 SH. 1 /07-047	1	STRUCTURAL STEEL UNIT 3 SPENT FUEL BLDG. ROOF BRACING AT EL. 84'-0" SECTIONS AND DETAILS	C	5610-C-1913 SH. 1	0	N/A	1
5610-C-1913 SH. 2 /07-047	1	STRUCTURAL STEEL UNIT 3 SPENT FUEL BLDG. ROOF BRACING AT EL. 84'-0" SECTIONS AND DETAILS	C	5610-C-1913 SH. 2	0	N/A	1

5610-C-1922 /07-047	1	CONCRETE PLAN VIEW EAST SIDE BENTS	C	5610-C-1922	0	N/A	1
5610-C-1923 /07-047	1	CONCRETE PLAN VIEW WEST SIDE BENTS	C	5610-C-1923	0	N/A	1
5610-C-1924 /07-047	1	CONCRETE BENTS 6 AND 1 PILE AND PILE CAP SECTIONS AND DETAILS	C	5610-C-1924	0	N/A	1
5610-C-1925 SH. 1 /07-047	1	CONCRETE BENT 6 MODIFICATION TO EXIST. FOUNDATION	C	5610-C-1925 SH. 1	0	N/A	1
5610-C-1925 SH. 2 /07-047	1	CONCRETE BENT 5 MODIFICATION TO EXIST. FOUNDATION	C	5610-C-1925 SH. 2	0	N/A	1
5610-C-1925 SH. 3 /07-047	1	CONCRETE BENT 6 AND BENT 5 GRADE BEAM - PILE AND PILE CAP SECTIONS AND DETAILS	C	5610-C-1925 SH. 3	0	N/A	1
5610-C-1926 SH. 1 /07-047	1	CONCRETE BENT 2 MODIFICATION TO EXIST. FOUNDATION	C	5610-C-1926 SH. 1	0	N/A	1
5610-C-1926 SH. 2 /07-047	1	CONCRETE BENT 1 MODIFICATION TO EXIST. FOUNDATION	C	5610-C-1926 SH. 2	0	N/A	1
5610-C-1926 SH. 3 /07-047	1	CONCRETE BENT 2 AND BENT 1 GRADE BEAM - PILE AND PILE CAP SECTIONS AND DETAILS	C	5610-C-1926 SH. 3	0	N/A	1
5610-C-1927 /07-047	1	CONCRETE BENTS 4 AND 5 PILE AND PILE CAP - SECTIONS AND DETAILS	C	5610-C-1927	0	N/A	1
5610-C-1928 /07-047	1	CONCRETE BENT 3 PILE AND PILE CAP - SECTIONS AND DETAILS	C	5610-C-1928	0	N/A	1
5610-C-1929 /07-047	1	CONCRETE BENT 2 PILE AND PILE CAP - SECTIONS AND DETAILS	C	5610-C-1929	0	N/A	1
5610-C-1930 /07-047	1	CONCRETE BENT 2.7 ANCHOR BOLT AND SHEAR KEY LOCATION AND DETAILS	C	5610-C-1930	0	DELETED	1
5610-C-1931 /07-047	1	CONCRETE BENT 3.6 ANCHOR BOLT AND SHEAR KEY LOCATION AND DETAILS	C	5610-C-1931	0	DELETED	1
5610-C-1932 /07-047	1	CONCRETE BENT 4.4 ANCHOR BOLT AND SHEAR KEY LOCATION AND DETAILS	C	5610-C-1932	0	DELETED	1
5610-C-1933 /07-047	1	CONCRETE BENT 6.1 AND 5.2 ANCHOR BOLT LOCATIONS AND DETAILS	C	5610-C-1933	0	DELETED	1
5610-C-1934 /07-047	1	CONCRETE BENT 1.9 AND 1.1 ANCHOR BOLT LOCATIONS AND DETAILS	C	5610-C-1934	0	DELETED	1
5610-C-23-597 SH 1/07-047	1	CRANE RAIL CLIPS	C	5610-C-23-597 SH. 1	0	N/A	1

5610-C-23-647 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-647 SH 1	0	N/A	1
5610-C-23-648 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-648 SH 1	0	N/A	1
5610-C-23-649 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-649 SH 1	0	N/A	1
5610-C-23-650 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-650 SH 1	0	N/A	1
5610-C-23-651 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-651 SH 1	0	N/A	1
5610-C-23-652 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-652 SH 1	0	N/A	1
5610-C-23-653 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-653 SH 1	0	N/A	1
5610-C-23-654 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-654 SH 1	0	N/A	1
5610-C-23-655 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-655 SH 1	0	N/A	1
5610-C-23-669 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-669 SH 1	0	N/A	1
5610-C-23-766 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-766 SH 1	0	N/A	1
5610-C-23-767 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-767 SH 1	0	N/A	1
5610-C-23-768 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-768 SH 1	0	N/A	1
5610-C-23-769 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-769 SH 1	0	N/A	1
5610-C-23-770 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-770 SH 1	0	N/A	1
5610-C-23-771 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-771 SH 1	0	N/A	1
5610-C-23-772 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-772 SH 1	0	N/A	1
5610-C-23-773 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-773 SH 1	0	N/A	1
5610-C-23-774 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-774 SH 1	0	N/A	1

5610-C-23-774 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-774 SH 1	0	N/A	1
5610-C-23-775 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-775 SH 1	0	N/A	1
5610-C-23-776 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-776 SH 1	0	N/A	1
5610-C-23-777 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-777 SH 1	0	N/A	1
5610-C-23-778 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-778 SH 1	0	N/A	1
5610-C-23-779 SH 1/07-047	1	FLORIDA STEEL CORPORATION CASK CRANE SUPPORT	C	5610-C-23-779 SH 1	0	N/A	1
5610-C-252 SH 1/07-047	18	AUXILIARY BUILDING	C	5610-C-252 SH. 1	0	N/A	0
5610-C-253 SH 1/07-047	16	AUXILIARY BUILDING	C	5610-C-253 SH. 1	1	N/A	1
5610-C-291 SH 1/07-047	6	AUXILIARY BUILDING	C	5610-C-291 SH. 1	1	N/A	1
5610-C-292 SH 1/07-047	6	AUXILIARY BUILDING	C	5610-C-292 SH. 1	1	N/A	1
5610-C-384/07-047	2	CASK HANDLING CRANE FOUNDATION PLAN AND DETAILS	C	5610-C-384	0	N/A	0
5610-C-650 SH 1/07-047	6	CASK CRANE SUPPORT SYSTEM GIRDERS, BRACING, A-FRAME	C	5610-C-650 SH. 1	0	N/A	0
5610-C-650 SH 2/07-047	0	CASK CRANE SUPPORT SYSTEM GIRDERS, BRACING, A-FRAME	C	5610-C-650 SH. 2	1	N/A	1
5610-C-651/07-047	2	CASK CRANE SUPPORT SYSTEM STRUCTURAL DETAILS SHEET #2	C	5610-C-651	0	N/A	0
5610-C-1156 SH 1/07-047	4	PERMANENT EAST PLANT HAUL ROAD MODIFICATIONS	C	5610-C-1156 SH 1	0	N/A	0
5610-C-1156 SH 2/07-047	3	PERMANENT EAST PLANT HAUL ROAD MODIFICATIONS	C	5610-C-1156 SH 2	0	N/A	0
5610-C-1921 SH 3 through 22/07-047 – See Attachment 14 – All drawings are Rev 0 – See Attachment 14 for drawing titles – Discipline are all C for Civil – Affected plant drawings are the same as the PCM drawing number – All plant drawings are Rev 0 – All drawings are Priority N/A – EP Rev is 2.							

IV.3. Affected Vendor Manuals N/A

Plant Doc No	Rev	Vendor/Equip	Disc	Remarks	EP Rev

IV.4. Attachments

	Title	Rev
1.	3-D Renderings (2 pages)	1
2.	10 CFR 50.59 Applicability Determination/Screening (10 pages)	0
3.	Fire Protection Review Checklist ENG-QI Form 3F (4 pages)	2
4.	License Renewal Review Checklist ENG-QI Form 3G (1 page)	4
5.	PC/M/MSP Pre-Implementation Walkdown Form 149 (1 page)	3
6.	Human Factors Engineering (HFE) Screening ENG-QI Form 3H (1 page)	0
7.	Environmental Qualification (EQ)Checklist ENG-QI Form 3E (1 page)	1
8.	UFSAR Change (4 pages)	As Noted
9.	ALARA Exposure Criteria Form 71 (1 page)	1
10.	Gantrex Rail Catalog Cut (14 pages)	N/A
11.	Proposed Haul Path (1 page)	0
12.	C/E/R Paper (51 pages)	0
13.	Affected Existing Plant Drawing (11pages)	0
14.	Erection Drawings (Index page and 20 drawings)	0

IV.5. References

Please note that the latest revisions will apply.

1. PC/M 07-048: Turkey Point Cask Crane - Existing Crane Removal
2. PC/M 07-049: Turkey Point Cask Crane - New Single Failure-Proof Crane Installation
3. FPL Specification SPEC-C-091: Turkey Point Units 3 and 4 Fuel Cask Crane Upgrade - Architect/Engineer Scope of Work
4. NUREG-0554: Single Failure-Proof Cranes for Nuclear Power Plants
5. FPL Procedure 0-ADM-717: Heavy Load Handling
6. PC/M 07-050: Turkey Point Cask Crane - Crane and Support Structure Interference Modifications
7. Washington Group Calculations FPL001-CALC-002:Design of Foundations and Steel Structure Support Connections
8. Washington Group Calculations FPL001-CALC-001: Supporting Crane Structure Seismic and Wind Load Analysis
9. ASME-NOG-1: Rules for Construction of Overhead Cranes
10. Washington Group Calculations FPL001-CALC-003: Stability Analysis During Installation
11. Washington Group Specification SPEC-WGInt-C-001: Design Criteria Document
12. Washington Group Report No. 29142-01; Cask Crane Support Structure Inspection Report
13. FPL Procedure 0-ADM-217: Conduct of Infrequently Performed Tests or Evolutions
14. FPL Procedure 0-GMM-102.18: Implementation Procedure for Heavy Hauls
15. FPL Specification SPEC-C-099: Fabrication of Structural and Miscellaneous Steel
16. FPL Specification: SPEC-C-004: Protective Coatings for Areas Outside the Reactor Containment
17. FPL Specification SPEC-C-101: PTN Cask Crane Upgrade - Steel Work and Miscellaneous Activities Construction Bid Specification
18. FPL Specifications CN-2.9 and CN-2.11: Concrete Specifications
19. Washington Group Document – The Project Work Plan (PWP)
20. NUREG-0612: Heavy Load Handling in Operating Nuclear Power Plant

22. Fuel Cask Crane Upgrade: Support Structure Dedication Report PTN-ENG-SECJ-08-025
23. Engineering Evaluation PTN-ENG-SECS-08-035: Underground Utilities Evaluation for Cask Crane Support Structure.
24. FPL/PTN Procedure 0-ADM-016: Fire Protection Program
25. FPL/PTN Procedure 0-ADM- 016.1: Transient Combustible and Flammable Substance Program
26. FPL/PTN Procedure 0-ADM-016.5: Hot Work Program
27. Specification SPEC-C-042: Specification for Grout PSL Units 1 & 2 and PTN Units 3 & 4
28. Specification CN-2.24: Drilled-In Expansion Anchor in Concrete St. Lucie Unit 1 & 2 and Turkey Point Unit 3 & 4

V. MATERIAL

V.1. Equipment and Material

Item	Quantity	Description	Reference	Pre-Purchased?
Concrete	As Required	Foundations	IV.5.18	No
Grout	As Required	Under Base Plates	IV.5.27	No
Steel	As Required	Superstructure	IV.5.15 & 17	Yes
Anchor Bolts/ Rods	As Required	Foundations	IV.5.17 & 28	Yes

Installation of all materials shall be performed per applicable specifications.

V.2. Spare Parts

Item	Quantity	Description	Reference	Pre-Purchased?
NONE				

VI. IMPLEMENTATION

NOTE:
No work shall be performed at the Auxiliary Building Roof Anchorages at Bents W 2.7 and W 3.6 under this PC/M, in accordance with the "Holdpoint" described under ABSTRACT Section.
Revision 1 of this PC/M released the "Holdpoint" for Bent 4.4, since a construction efficient design has been developed for this location.

VI.1. Implementation Instructions/Specifications

VI.1.1 Implementation Instructions:

NOTE: Adherence to these construction conditions is **MANDATORY** so as to prevent collapse of the cask crane support structure during the upgrade work. If these conditions cannot be met for some unforeseen reason, the project engineer shall be notified immediately prior to proceeding with further work activities.

Definitions:

1) NS bracing (**NSB**) – this is the bracing in the east side support structure which is oriented in the NS direction in the column line between bents E1-E2 and E5-E6.
2) Horizontal bracing at 59' Elevation (**HB59**) – this is the bracing in the east side support structure at El 59' that spans between E1-E2, E2-E3, E3-E4, E4-E5, E5-E6.

3) Lateral bracing (LB) - this is the bracing which is connected to both the east and west runway girders and which provides lateral stability for these girders.
4) Webs – these are the members which connect between the vertical and inclined columns of all the bents.

General:

1) Prior to the initiation of any field work associated with the PTN cask crane upgrades, including excavations, pile work, concrete grade beam work and steel modifications, operation of the existing cask crane will be turned over to the ISFSI project manager. At this point, the crane will be declared 'Out of Service' (OOS) and, operation and use of the crane for plant maintenance or ISFSI related tasks will be under the direction of the ISFSI project manager. As discussed in the 'Limitations on Excavation' section below, the existing cask crane may remain operational while the excavation work is in progress. During this period, the crane will be administratively limited to 50 tons lift capacity, which is less than half its rated capacity. Therefore, use of the crane during this period, will require a release authorization by the ISFSI project manager. Prior to commencement of any steel modification work, the crane will be permanently declared OOS.
2) Cover plating/reinforcement of existing members as specified on design drawings should be completed to the extent possible prior to removal and replacement of adjacent structural members. This will enhance structural stability during interim configurations.
3) Unless otherwise noted below, removal and replacement of structural steel members or assemblies should be carried out on a one for one basis with the intent that upon removal of a member its replacement will be installed. No members or assemblies whose replacements are not ready and available for immediate installation shall be removed.
4) It is anticipated that during the course of the work the existing crane will be moved along its runway numerous times. This is because of the conditions outlined below. The crane shall not be moved across any bent or bay whose members or bracing are not structurally intact.
5) After the crane is moved to the desired location it will be securely locked down to the runway girder to prevent movement. Special clips to engage the runway girder flanges have been designed for attachment to heavy duty chain binders for locking down the crane. Two binders shall be placed on each east and west end of the crane for a total of four. The crane shall only be locked down in the end bays. On the north end this is between bents E1-E2 on the east side and U3 SFB wall supports W1.1-W1.9 on the west side. On the south end this is between bents E5-E6 on the east side and U4 SFB wall supports W5.2-W6.1 on the west side.
6) Work during the entire evolution of removal and replacement of all structural elements/assemblies must be planned to be performed and completed when the wind is less than 40 mph. Any interim configurations for which this condition cannot be complied with must be temporarily braced as outlined below.
7) Provided all other conditions outlined within this paper are met, modifications to the steel structure may be performed concurrent with the earthwork excavation.

North-South Direction Stability:

1) NSB and its associated HB59 can only be removed from between one set of bents at a time (i.e. either between E1-E2 while E5-E6 NSB and HB59 is intact or between E5-E6 while E1-E2 NSB and HB59 is intact).
2) During the period of removing and replacing the NSB and HB59 from between E1-E2 or E5-E6, the existing crane must be parked and locked down at the extreme opposite end of the support structure.
3) Removal and replacement of HB59 between E2-E3 or E3-E4 or E4-E5 shall be done between one set of bents at a time and while NSB (either existing or new) is intact in both end bays.
4) During removal and replacement of HB59 between bents E2-E3, E3-E4, E4-E5, the crane must be securely locked down at the end bay across the runway girder expansion joint away from the bay being worked. The runway girder expansion joint on the east side support structure is at bent E3. So, during removal and replacement of HB59 between bents E2-E3, the crane must be securely locked down in bay E5-E6 and, during removal and replacement of HB59 between bents E3-E4 and E4-E5, the crane must be securely locked down in bay E1-E2.
5) During removal and replacement of NSB and HB59 in any particular bay, the runway girder LB shall not be removed in that bay or an adjacent bay.

East-West Direction Stability:

1) Removal and replacement of web members of bents E1 and E6 shall be performed one joint at a time and when the NSB and HB59 (either existing or new) connecting to these bents is intact. One joint at a time means that two members framing into a joint may be removed at the same time.
2) Removal and replacement of web members of bents E2, E3, E4, E5, W2.7, W3.6 and W4.4 shall also be performed one joint at a time and when HB59 (either existing or new) on both sides of the bent is intact. Ideally, web member removal and replacement in these bents should be performed after the new trusses attaching to them have been installed.
3) Removal and replacement of the horizontal web at elevation 84' – 1 ¾" in all bents must occur prior to removal and replacement of the web members above it within each bent (Ref dwg 5610-C-1903 Sht 1, Detail A).
4) When it is anticipated that removed webs from any bent cannot be immediately replaced and that winds in excess of 40 mph are predicted, then the bent shall be temporarily braced as shown on the attached sketch. It is acceptable to attach the temporary bracing angles to the column flanges with heavy duty C-clamps capable of developing at least 35,000 lb clamping force with a 1 ¼" screw as shown in the attached sketch. Each angle shall be fastened to the column and column brace flanges with 2 clamps per end, for a total of 8 clamps per angle set. The clamps shall be set so that the screw bears on the temporary bracing angle and not the column. The clamp screws shall be tightened to 625 ft-lbs of torque.
5) During removal and replacement of the web members in each bent, the crane must be securely locked down at the end bay across the runway girder expansion joint away from the bent being worked. The runway girder expansion joint on the east side support structure is at bent E3. So, during removal and replacement of the web members in bents E1, E2 and E3, the crane must be securely locked down in bay E5-E6 and, during removal and replacement of web members in bents E4, E5 and E6, the crane must be securely locked down in bay E1-E2. The runway girder expansion joint on the west side support structure is at bent W3.6. So, during removal and replacement of the web members in bent W2.7 the crane must be securely locked down in bay W5.2-W6.1 and, during removal and replacement of web members in bent W4.4, the crane must be securely locked down in bay W1.1-W1.9. Finally, during removal and replacement of web members in bent W3.6, the crane must be securely locked down in either bay W1.1-W1.9 or bay W5.2-W61.
6) During removal and replacement of the web members of any particular bent, the runway girder LB shall not be removed in the bays on either side of this bent.

Runway Girder Stability:

1) During removal and replacement of the runway girder LB, only one bay may be worked at a time on either the east or west runway girder.
2) During removal and replacement of the runway girder LB the crane must be securely locked down at the end bay across the runway girder expansion joint away from the bay being worked. The runway girder expansion joint on the east side support structure is at bent E3. So, during removal and replacement of the LB in bays E1-E2 and E2-E3, the crane must be securely locked down in bay E5-E6 and, during removal and replacement of the LB in bays E3-E4, E4-E5 and E5-E6, the crane must be securely locked down in bay E1-E2. The runway girder expansion joint on the west side support structure is at bent W3.6. So, during removal and replacement of the LB bays W1.1-W1.9 and W1.9-W2.7 and W2.7-W3.6, the crane must be securely locked down in bay W5.2-W6.1 and, during removal and replacement of LB in bays W3.6-W4.4 and W4.4-W5.2 and W5.2-W6.1, the crane must be securely locked down in bay W1.1-W1.9.
3) During removal and replacement of the runway girder LB in any particular bay, the two bents supporting that bay must be fully intact (either existing or new).
4) During removal and replacement of the runway girder LB in any particular bay, the HB59 in that bay must be intact (either existing or new).

5) During removal and replacement of the runway girder LB in any particular bay, a vertical uniformly distributed construction load, such as a hanging scaffold, of 450 lb/ft may be applied to the runway girder. Any proposed construction loads on the runway girders must be reviewed and approved by the project engineer.

Limitations on Excavation:

1) The excavation at vertical column pier E1, E2, E5 and E6 for the installation of grade beams and through bolts shall be not more than 5' below grade.
2) The excavation at inclined column pier E1 and E6 for the installation of grade beams and through bolts shall not be more than 6 ½' below grade.
3) With the provision that all existing support structure steel remains intact, the existing crane may continue to be operational while the excavations discussed in #s 1 and 2 above are made. During this period the existing cask crane shall be limited to a lifted load capacity of 50 tons.

Implementation Procedure :
See Attachment # 12 for a suggested implementation sequence. The installer may change the sequence, if deemed necessary, provided safety is assured and it is approved by FPL.

VI.1.2 Implementation Specifications:
Unless otherwise noted in this PC/M, all work shall be performed in accordance with and comply with applicable plant procedures and specifications. The following list (not necessarily all inclusive) of generic and project specific specifications (latest revision) shall apply:

SPEC-C-007 - "Erection of Structural and Miscellaneous Steel for PTN Units 3 & 4 and PSL Units 1 & 2".

SPEC-C-014 - "Guidelines for Installation and Use of Permanent Rigging Attachments".

SPEC-C-042 - "Specification for Grout, PSL Units 1 & 2 and PTN Units 3 & 4".

SPEC-C-099 - "Procurement, Fabrication and Delivery of Structural and Miscellaneous Steel for turkey Point Unit 3 and 4 Cask Crane Support Structure Upgrade".

SPEC-C-101 - "PTN Cask Crane Upgrade Steel Work and Miscellaneous Activities Construction".

SPEC-C-102 - "PTN Cask Crane Upgrade Pile Work Construction".

SPEC-CIV-010 - "Excavation and Backfill".

SPEC-CN-2.9 - "Specification for Concrete Materials and Mixes, Concrete Mixing and Transportation"

SPEC-CN-2.11 - "Specification for Concrete Testing, Placing, Curing and Finishing".

SPEC-CN-2.24 - "Drilled-in Expansion Anchors In Concrete, St Lucie Units 1 & 2 and Turkey Point Units 3 & 4".

FPL Weld Control Manual

VI.2. Repairs Required Per Inspection of the Structure (Report No. 29142-01)

V1.2.1 Concrete/Grout Repair – The deteriorated portion of grout and concrete at column bases of E2, E5 and E6 shall be removed and repaired per Ref. IV.5.18.

V1.2.2 The bearing pads at columns W1.1, W1.9, W5.2 and W6.1 shall be cleaned and inspected. It is recommended for replacement, depending upon the condition found.

V1.2.3 Replace all high strength bolts at the East and West expansion joints on the rail girder. FPL will, during progression of the work, identify, characterize, assess and recommend an appropriate remedy for all areas of structural degradation/corrosion found on the structural members to remain.

V1.2.4 Cracked concrete on Auxiliary Building walls to be repaired per Ref.IV.5.18.

V1.3 Post Maintenance Acceptance Testing

N/A

V1.4 Operation and Maintenance Guidelines

The Turkey Point Plant Cask Crane and Support Structure is being upgraded to a Single Failure-Proof Crane design and a Class I Support Structure under PC/Ms 07-047, 07-048, 07-049 and 07-050. Once implemented, the current Class III cask crane and support structure Maintenance Rule monitoring plan is required to be reviewed and updated for the system and function level requirements for the new Single Failure-Proof Crane design and the Class I Support Structure design. The Turkey Point Plant System Engineer is to evaluate the current Maintenance Rule Performance Monitoring requirements (In accordance with 10CFR50.65) and determine the need to upgrade the Performance Monitoring Plan for the newly upgraded Class 1 Cask Crane Support Structure and the upgraded Single Failure-Proof Cask Crane system. Develop a Maintenance Rule Performance Monitoring Plan for the new Cask Crane/Support Structure system that includes system and function level monitoring. (Action tracked under Condition Report 2008-25663).

FIGURE FPL-081001-2
CASK CRANE SUPPORT STRUCTURE MODIFICATION CONCEPT

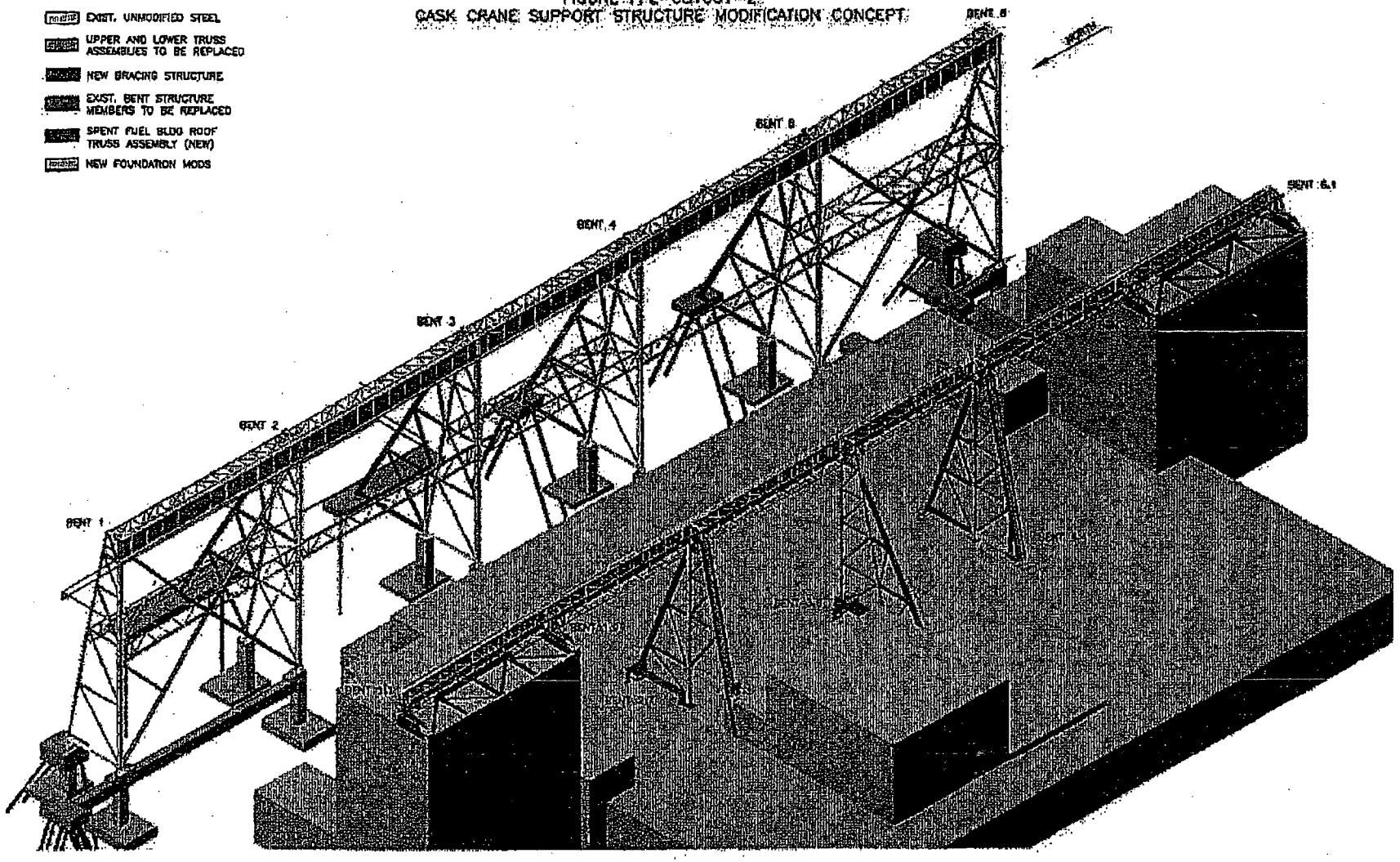


FIGURE FPL-081001-1
CASK CRANE SUPPORT STRUCTURE MODIFICATION CONCEPT

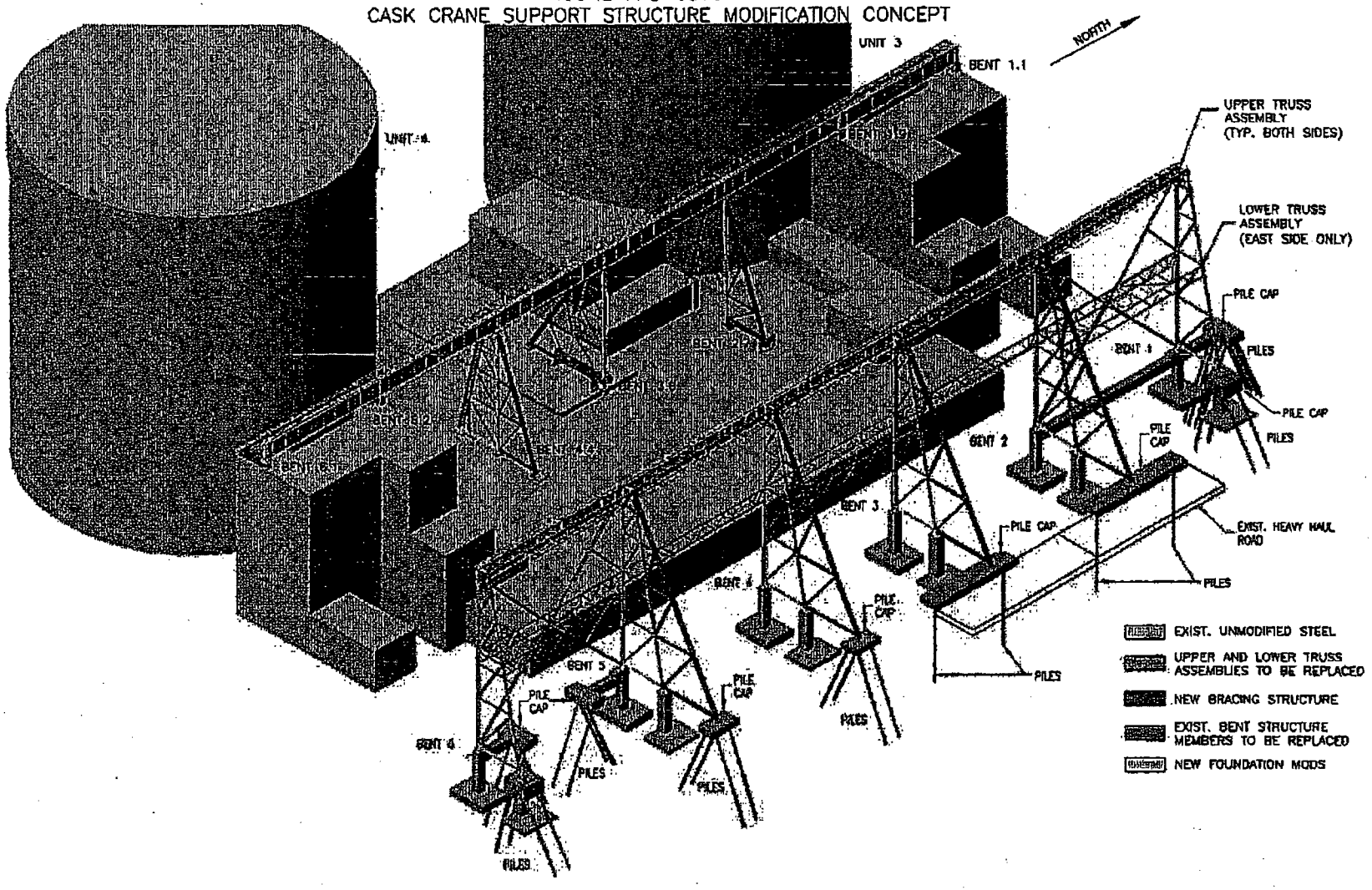


FIGURE FPL–080711–1
CASK CRANE SUPPORT STRUCTURE MODIFICATION CONCEPT

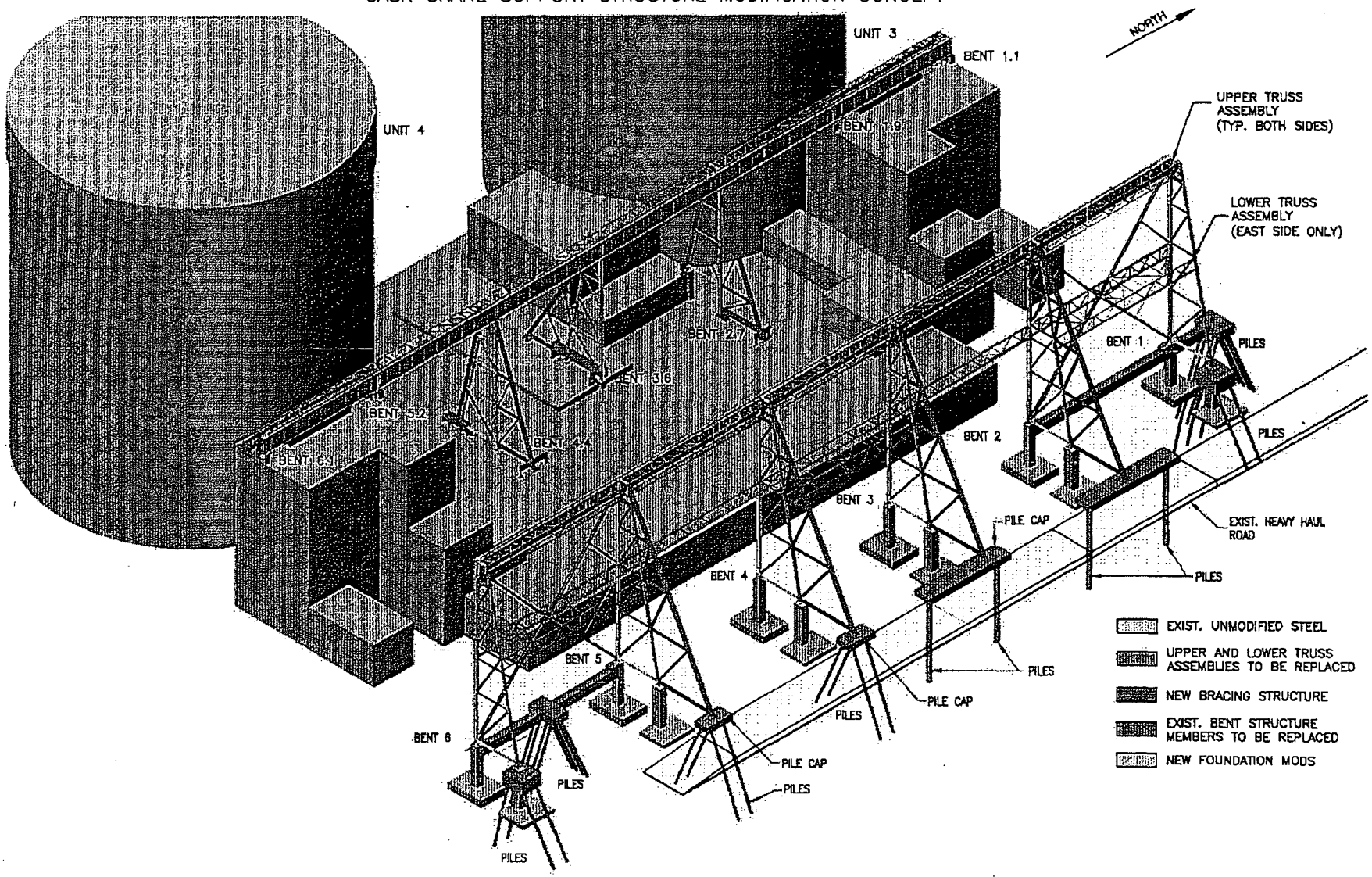
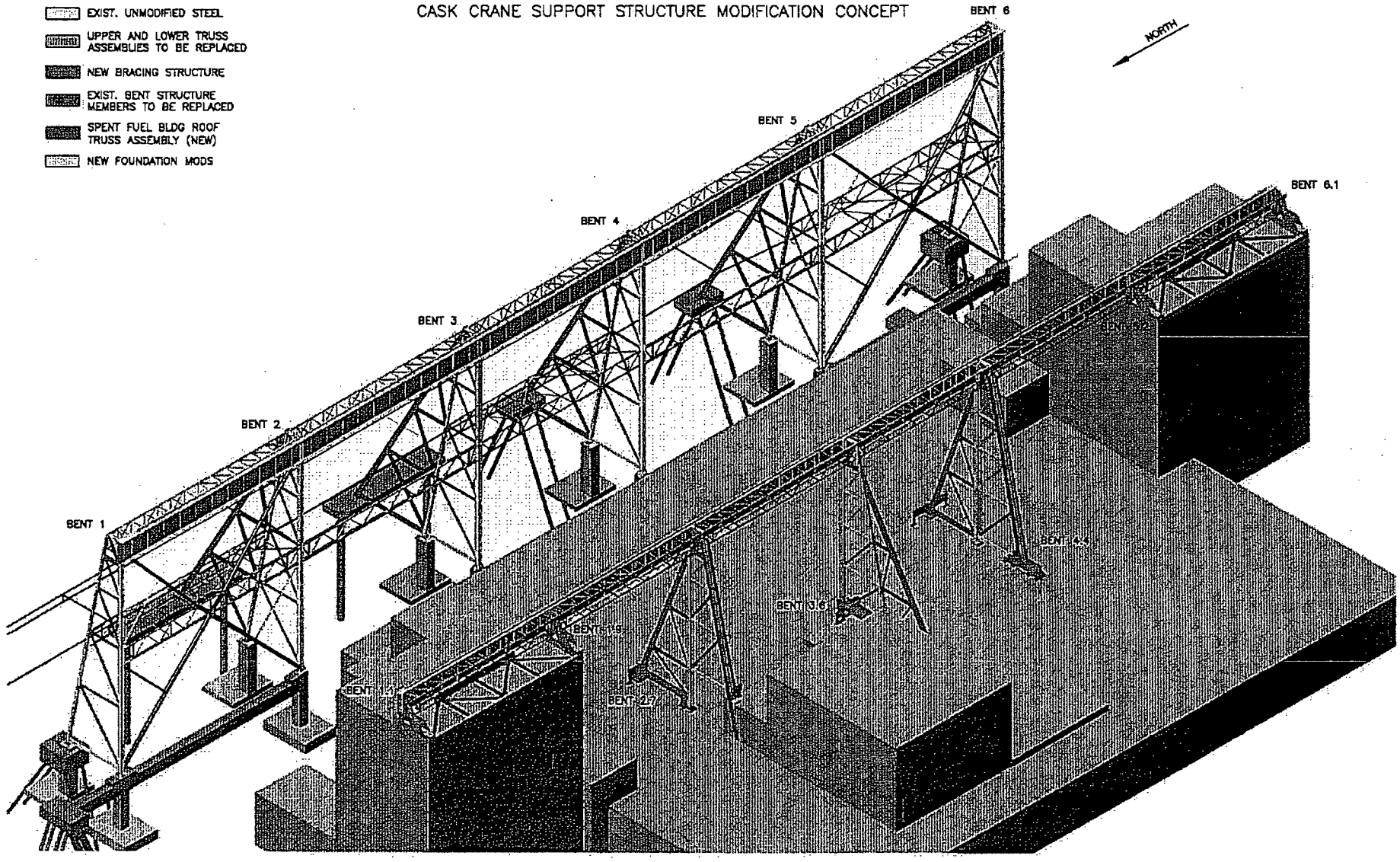


FIGURE FPL–080711–2
CASK CRANE SUPPORT STRUCTURE MODIFICATION CONCEPT



10CFR50.59 APPLICABILITY DETERMINATION

Document Number: **PC/M 07-047** Revision Number: **0**

Title: **Turkey Point Cask Crane - Support Structure Upgrade**

Brief Description of Activity: **This PC/M will cover analysis, installation and demolition and reclassification of the support structure for the future installation of the single-failure-proof crane. The activities that involve installation of the new single-failure-proof crane, removal of the existing cask crane and the mechanical and electrical interfaces are covered in separate PC/Ms.**

Address the questions below for all aspects of the activity. If the answer is **YES** for any portion of the activity, apply the identified process(es) to that portion of the activity. Note that it is not unusual to have more than one process apply to a given activity. See the "Guidance For Performing 10CFR50.59 Evaluations" for additional guidance. The guidance document can be accessed in Lotus Notes from the JB Nuclear Notes Page by selecting the following: Procedures / Engineering.

10CFR50.59 Applicability Determination.

I. Does the proposed activity involve a change to the:		See Section 4.2.1 of the Guidance Manual.
1. Technical Specifications or Operating License?	☒ NO ☐ YES	If YES, process License Amendment Request in accordance with 10CFR50.90.
2. Quality Assurance Plan, Security Plan, Emergency Plan, IST Program Plan, or ISI Program Plan?	☒ NO ☐ YES	If YES, process change in accordance with 10CFR50.54 or 10CFR50.55 as applicable.
3. Fire Protection Program?	☒ NO ☐ YES	If YES, process per Fire Protection Program changes.
II. Does the Proposed activity involve maintenance which restores SSCs to their original condition or involve a temporary alteration (e.g., TSA / ECO) supporting maintenance that will be in effect during **at-power** operations for 90 days or less?	☒ NO ☐ YES	See Section 4.2.2 of the Guidance Manual.
III. Does the proposed activity involve a change to the UFSAR (including documents incorporated by reference) excluded from requirement to perform a 10CFR50.59 review by Section 4.2.3 of the Guidance Manual?	☒ NO ☐ YES	If YES, ensure FSAR User Comment Form completed.
IV. Does the proposed activity involve a change to managerial or administrative procedures governing the conduct of facility operations?	☒ NO ☐ YES	See Section 4.2.4 of the Guidance Manual.
V. Does the activity impact other plant specific programs (e.g., the ODCM) which are controlled by regulations, the Operating License or Tech Specs?	☒ NO ☐ YES	If YES, process per Technical Specifications and Program requirements (See Section 4.2.1 of the Guidance Manual).

☐ All aspects of the activity are controlled by one or more of the processes above, therefore a 10CFR50.59 screening is not required.

Basis: _____

Complete the form by printing name, signing, and dating the form.

☒ If the activity or any portion of the activity is not controlled by one or more of the processes above, complete the 10CFR50.59 Screening.

- ☒ Entire activity subject to screening.
- ☐ Portion of activity subject to screening.

10CFR50.59 SCREEN

10CFR50.59 Screening (See Section 5.2.2 of the Guidance Manual for additional guidance):

1. Does the proposed activity require a change to the Technical Specifications? *Justification:* The current spent fuel cask handling crane is designed for a capacity of 105/15-ton main/aux hook capacity and is used for maintenance activities. It is desirable to be used for spent fuel cask activities for both units to support the ISFSI. The current crane is designed as a Safety Class III structure. The new crane will have a capacity of 130/25–ton main/aux hook capacity and it is designed as a single-failure-proof crane that satisfies the requirements in NUREG-0554. The crane replacement is handled by PC/M 07-048 and PC/M 07-049. The final support structure design will be Safety Class I and comply with all the UFSAR Class I design criteria. The justification is described in PC/M 07-047. Technical Specification 3.9.7 has a load restriction of 2000 lbs over the spent fuel pool. By continuing to follow the current administrative procedure 0-ADM-717, Heavy Loads Handling, the temporary crane and current crane will be restricted from any loads being lifted over the spent fuel pool therefore this modification does not impact the current Technical Specifications. As per 0-ADM-717 section 5.2.1 instruction, the Component Cooling Water (CCW) header is split using 3/4-OP-030 when any movement of loads greater than 5 tons are moved over the CCW piping in the cask wash area. In addition, when CCW is split, an Emergency Containment cooler must be declared inoperable. Remedial action of Technical Specification 3.6.2.2 only allows this condition for 72 hours. The proposed loads moved are not expected to exceed 5 tons. The loads and load blocks will be inspected to ensure no load is more than 5 tons before the load is moved. Therefore, the proposed activity is in accordance with the existing Technical Specifications and does not require a change to the Technical Specifications or Operating License. The activity will not impact the frequency of or the specific actions within any surveillance test, does not impact any Limiting Condition of Operation (LCO), nor does it impact the Technical Specification bases. The new design feature of the crane, cask handling for ISFISI, does not meet the criteria of 50.36, which would require new or revised Technical Specifications.	☒ NO ☐ YES
If YES, **then** request and receive a License Amendment prior to implementation of the activity.	
2. Does the proposed activity involve a change to an SSC that adversely affects an UFSAR described design function? *Justification:* **Crane and Support Structure** The crane support structure is designed to support the current cask crane for all operating and severe environmental conditions (e.g. tornado wind and missile loads, hurricane wind loads, pressure differentials, seismic events, and flooding). The existing cask crane support structure is classified as a Class III structure. The upgraded cask crane support structure will be classified as a Class I structure. UFSAR Appendix 5A summarizes the design bases of Structures. Design accident, wind and earthquake load conditions are summarized in UFSAR Appendix 5 A-1.3. The crane support structure meets all the design load combination requirements for Class I structures identified in Appendix 5 A.	☒ NO ☐ YES

The upgraded support structure design was analyzed to support a new 130/25-ton main/aux hook capacity single-failure-proof crane. The design and analysis values satisfactorily address all the required structural steel modifications to the cask crane runway, runway girders, runway rail stops, runway girder rails and rail clips, structural steel framing, and other affected SSCs including the auxiliary building, the haul path and underground utilities.

The tornado missile criteria for Class I structures are summarized in UFSAR Appendix 5E. An assessment has been performed and concluded that the change complies with existing licensing basis for missile spectra as follows:

- The impact energy of the corrugated siding will be absorbed in the deformation of the missile itself and the stored strain energy of the target support member. Therefore, the missile will cause no credible damage to the crane or the support structure and no catastrophic structural failure is predicted.

- The bolted wood decking missile is a high kinetic energy missile. However, the UFSAR has no mention of orientation of the impact geometry. It is reasonable to assume that the missile is expected to strike the support structure in a random orientation at any height. It is also reasonable to assume that a single member impact be considered the worse case since a joint or main A-frame is structurally more robust. An impact to a joint would not result in significant damage. It is postulated that substantial local damage could occur to a single member such that failure of that single member would result. However, failure of any one member by itself will not cause a catastrophic structural failure.

- By visual inspection of the site general arrangement, most of the support structure is protected from a direct impact of a passenger car on the ground by buildings and other structures in the vicinity of the support structure. Those members not protected by buildings or structures have specific bollards or a similar type barrier which will absorb a large portion of the impact energy of the car missile. These protective structures will dissipate sufficient amounts of energy such that any subsequent impact on the support structure will not be sufficient to cause any significant damage or result in a catastrophic structural failure of the crane support structure.

In addition, the support structure has been reviewed to assure no loss of function for a limiting tornado wind speed of 337 MPH and a pressure differential of 2.25 psi simultaneously. The wind load can cause minor deformation (end support plate but will not cause a loss of function of the support structure.

Based on the above, the support structure will not collapse under UFSAR described design basis loads for Class I structures and will have no adverse effect on safety related SSCs such as the Refueling Water Storage Tanks, Spent Fuel Pool Building or the Auxiliary Building.

The existing runway and supporting framing are fabricated of ASTM standards material. All new materials for the upgrade are compatible with existing steel and fabricated in accordance with the existing UFSAR design criteria. The existing support structure materials will be commercially dedicated in accordance with the appropriate procedures. The materials are coated in accordance with FPL coating procedures to account for exposure to salt laden environment for

corrosion purposes.

No operational condition could impact safety when the crane is in an interim configuration. The cask crane will not be handling any loads during upgrade construction and will be located at the opposite bays or as far as possible from any construction activities to maintain stability of the support structure. This increases the stability of the support structure and allows replacement of existing members without the addition of temporary supports. A stability evaluation was performed and concluded the structure will not collapse during construction.

The current electrical grounding configuration is displayed on Drawing 5610-E-301: Grounding Notes, Symbols and Details. The electrical grounding cables are non-safety related and will be temporarily looped to support the installation and demolition of the support structure. The temporary configuration will not have any adverse effects on any SSCs. Once the support structure installation activities in the vicinity are complete, the grounding cables will be returned to the original configuration or a functionally equivalent configuration and will have no adverse effect on any safety related SSCs.

The UFSAR design function of the crane and the support structure will change to reflect the new ISFSI cask handling function as well as the new safety and seismic classification. The new crane and support structure are being upgraded to a more conservative design and will not have an adverse affect on any SSCs. There are no adverse effects between the existing materials and the replacement materials.

Other SSCs Impacted

The Auxiliary Building supports provided to the west side of the crane support structure will be modified by this PC/M. The modifications require anchoring to the Auxiliary Building roof and walls. Engineering evaluation, FPL001-CALC-002: Concrete Calculations", verifies the Auxiliary Building walls and foundation structural integrity is maintained within the Class I design bases for all loads. The temporary loads from the support structure demolition activities on the Auxiliary Building roof do not adversely affect any safety related SSCs.

The addition of and reinforcements of the existing piers and footings are adequate to meet the design criteria for Class I structures as defined in the PTN UFSAR. The modifications do not adversely affect safety related SSCs.

The installation of the caissons in the vicinity of the Intake Structure will be augured using an installation method that does not impact the Intake Structure. The final configuration of the caissons does not increase any stresses on the Intake Structure. Therefore, there is no adverse effect on the Intake Structure.

The activities do not impact any buried SSCs under the East heavy haul road used for the structural steel installation and demolition. All underground utilities between the Auxiliary Building and the East side A-frames and the ISFSI heavy haul road were evaluated (see Engineering Evaluation PTN-ENG-SECJ-08-035) to demonstrate no loss of structural stability will occur due to the weight of the mobile crane and the load lifts performed.

FPL procedure 0-GMM-102.18, "Implementation Procedure for Heavy Hauls" will not be implemented for the modification since the mobile crane and load lifts will not exceed 165,000 lbs.

Additional measures to address the potential for load handling accidents during the installation and demolition are provided below.

Heavy Loads

The modification requires lifting heavy loads in the vicinity of safety related equipment. The administrative controls and restrictions are in accordance with NUREG-0612 "Control of Heavy loads at Nuclear Power Plants", 0-ADM-726, "Rigging Operations" and 0-ADM-717 "Heavy Loads Handling". Any temporary changes to the above administrative procedures are conducted in accordance with the appropriate procedures to reflect specific deviations for this modification. All load paths over the restricted areas identified on Attachment 9 of 0-ADM-717 is considered a deviation from the safe load path and is evaluated in accordance with FPL procedure 0-ADM-225 "On Line Risk Assessment and Management" if required.

The proposed load path has been chosen and planned to reduce the potential for impact on SSCs in the area and/or in the direct load path. The load is controlled by procedures consistent with FPL's implementation of the guidelines in NUREG-0612. The conservative safety factors in conjunction with the administrative/procedural controls minimize the potential for load drops and/or other load handling accidents including those associated with operator error. However, additional administrative controls (e.g., the use of temporary barriers, the use of spotters, crane and load travel restrictions, and so forth) may be implemented in the vicinity of safety-related SSCs to assure that a load handling incident is minimized.

The procedure has administrative controls on the weight of loads over SSCs in the safe load path. The loads over the Auxiliary Building remain below the 5 ton restriction as per 0-ADM-717. The spent fuel pool has a restriction of 2000 lbs. per the Technical Specifications. The heavy loads procedure identifies a load path that does not go over the spent fuel pool. The area that bounds the Refueling Water Storage Tanks (RWST), the Gas House and the Primary Water Storage Tanks (PWST) together has a restriction of 1760 lbs (refer to attachment 9 of 0-ADM-717). The RWST tanks must be operable in Modes 1, 2, 3 and 4 for the ECCS. The RWST is a redundant borated water source during Modes 5 and 6 and is not required to be operational unless the Boric Acid Storage System is inoperable. The modification is being performed at power for both units; therefore, the RWST tanks are required to be operational. If a load drop would cause a tank to be inoperable the affected unit shall comply with Technical Specification 3/4.5.4 and Technical Specifications 3.1.2.5. The load path and practical compensatory measures were developed to have the least impact on the two RWST. The Gas House and PWST are not safety related. The Gas House has been previously evaluated in the UFSAR for its impact on fire protection. The fire loads are acceptable and a load drop on the Gas House will have no adverse effects on SSCs. The PWST is an unborated, deaerated, demineralized makeup water source that is used to supply the makeup water to the Reactor Coolant System (RCS). In the unlikely event of a load drop that would make the PWST inoperable, there are redundant systems to supply the necessary makeup water to the RCS with three other water sources identified in Section 9.2 of the UFSAR. The load path and practical compensatory measures were developed to have the least impact on the PWST and the Gas House. Any load path deviations for the activities have been evaluated in accordance with 0-ADM-225. Based upon the above discussion, the modification will have no

adverse impacts on the RWST and the PWST or the Gas House or other safety related SSCs.

The Intake Structure is also in the vicinity of the load handling activities. 0-ADM-717 has a load restriction of 1760 lbs. over specific areas of the Intake Area Bridge (refer to Attachment 6 of 0-ADM-717). The heavy loads procedure identifies a load path, administrative controls and restrictions that have the least impact on the Intake Area. The administrative procedure assures the entire path of the mobile crane is considered and required compensatory actions established.

The heavy loads procedure has operational conditions to restrict load lifts during severe weather. The mobile crane that used for all lifting activities will not be operated in high winds or weather conducive to tornadoes and hurricanes. It also will be relocated away from safety-related SSCs under these conditions. The weather and high wind conditions identified in heavy load procedure are the administrative controls for meteorological conditions that will be applied to the temporary crane lifts and other lifts by the current cask crane.

The appropriate personnel verify compliance with requirements established in procedure 0-ADM-717 during the lifting activities involved with this PC/M (i.e., weather conditions and load restrictions). All loads are inspected to ensure that no load exceeds the margin of safety. All the rigging, hoist, miscellaneous lifting components and the mobile crane are inspected and tested in accordance with the approved procedures.

Rigging is used in accordance with the guidelines of ANSI B30.9-1971. The margin in the lifting capacity of the crane and the rigging is in accordance with NUREG-0612, 0-ADM-726 and 0-ADM-717.

The mobile crane, used for the construction activities, has sufficient rated capacity to satisfy NUREG-0612 factor of safety requirements. As per FPL procedure 0-ADM-717, "Mobile cranes shall be inspected and tested before lifting heavy loads in restricted areas for mobile cranes in accordance with the approved procedure for conducting the lift."

The laydown area for all existing support structure activities in the RWST and PWST and haul path has been analyzed in accordance with the approved FPL procedures. All underground utilities in the laydown area have been identified and shown to not be adversely affected by the additional weight of the support structure construction. The Auxiliary Building Roof laydown area has been visually inspected. No additional evaluation was considered necessary. The laydown areas have no adverse impact on the SSCs.

In accordance with FPL procedure 0-ADM-726, the mobile crane operations follow all the restrictions and procedure requirements. The Rigger's Guide, enclosure 1 to FPL Procedure 0-ADM-726, is followed to choose the correct methods and rigging materials to perform the temporary lifts required for this PC/M.

If the load does not be following the load path for mobile cranes identified in FPL procedure 0-ADM-717 attachment 9, the load is defined as a critical load as per procedure 0-ADM-726. Instruction 5.5.5, "For critical lifts, the rigging plan shall include a 5-minute load hold within the first one foot of the lift." is followed. All required checklists for critical lifts and mobile cranes are completed prior to all

load lifts. The heavy loads that are involved with this PC/M have no adverse impacts on SSCs. The compensatory measures, safety factors, and operational and administrative controls that are identified in the FPL procedures and guidance in NUREG-0612 minimize the potential for a load handling accident. The safe load path and the laydown area are evaluated for the least impact on SSCs; therefore heavy load lifts do not adversely affect any SSCs. **Conclusions** The modification has no adverse impacts on any SSCs UFSAR design functions. The materials interactions, seismic loads, wind loads, and missile loads have no adverse impact on the crane, the support structure, the auxiliary building and the haul path. The electrical grounding cables are temporarily removed during installation and have no adverse impact on SSCs. The compensatory measures, safety factors, load path and operational controls minimize the potential for load drops; therefore heavy load lifts do not adversely affect any SSCs.	
3. Does the proposed activity involve a change to a procedure that adversely affects how UFSAR described SSC design functions are performed or controlled? *Justification:* Heavy load lifts and rigging operations are not performed outside the bounds of FPL procedures 0-ADM-717 and 0-ADM-726. Any changes required to these procedures do not affect any UFSAR described SSC design functions. The modified procedures have restrictions and administrative controls equivalent to or more conservative than current restrictions. Therefore, there is no procedure change that will adversely affect UFSAR described SSC design functions.	☒ NO ☐ YES
4. Does the proposed activity involve revising or replacing an UFSAR described evaluation methodology that is used in establishing the design bases or used in the safety analyses? *Justification:* The proposed activity does not impact, revise or replace any methodology described in the UFSAR that is used in establishing the design bases and reflected in the safety analyses for the support structure. The design of the Seismic Category I crane support structure and concrete meets the current design criteria described in the UFSAR. The methodologies used to design the support structure to meet all criteria established for Seismic Category I structures are described in the UFSAR in Chapter 5. Therefore, this modification does not involve an adverse change to an element of a UFSAR described evaluation methodology, or use of an alternative evaluation methodology, that is used in establishing the design bases or used in the safety analyses.	☒ NO ☐ YES
5. Does the proposed activity involve a test or experiment not described in the UFSAR, where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the UFSAR?	☒ NO ☐ YES

Justification: The activity does not involve a test or experiment not described in the UFSAR nor does it require the application of any new test or experiment. The proposed activity pertains to a permanent modification to a structure and component and the implementation of that permanent modification. The proposed activity does not require any abnormal system alignments or special modes of operation of any SSC. The activity does not utilize or control an SSC in a manner that is outside the reference bounds of their design bases or those of their interfacing systems. The proposed activity does not cause any SSC to operate in an unevaluated condition that is not consistent with the design basis as described in the UFSAR. Therefore, the proposed design change does not involve a test or experiment not described in the UFSAR, where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the UFSAR.	
If question 2, 3, 4 or 5 is answered YES, **then** a 10CFR50.59 Evaluation shall be performed.	

For PSL only:
Appendix A of this form has been completed and ☐ does or ☐ does not require 10CFR72.48 applicability/screening to be performed in accordance with ENG-QI 2.9.

List the documents (UFSAR, Technical Specifications, and other documents) reviewed as applicable:

The following PTN UFSAR Revision 17 sections were reviewed:

Section 2.6.6	Severe Weather
Section 5.2.3	Design Codes and Design Description
Appendix 5 A	Seismic Classification & Design basis for Structures, Systems, and Equipment for Turkey Point
Appendix 5 I	Heavy load Handling
Section 9.2	System Design and Operation
Section 9.5	Fuel Handling System
Section 14.2.1	Fuel Handling Accidents
Appendix A	A Functional Evaluation of the Components of the Systems Which are Shared by the Two Units.

The following NRC documents were reviewed:

1. NUREG-0612, "Control of Heavy Loads", July 1980
2. NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants", May 1979
3. RIS 2005-25, "Clarification of NRC Guidelines for Control of Heavy Loads", November 1, 2005
4. RIS 2005-25, "Supplement 1 Clarification of NRC Guidelines for Control of Heavy Loads", May 29, 2007
5. NRC Letter, "Final TER on Control of Heavy Loads", November 1, 1983
6. Regulatory Guide 1.76, "Design Basis Tornado and Tornado Missiles For Nuclear Power Plants", Revision 1 March 2007
7. Regulatory Guide 1.117, "Tornado Design Classification" Revision 1 April 1978

The following FPL documents were reviewed:

1. Technical Specifications Amendments 232 and 237.
2. FPL Letter FSP 08-070, "Turkey Point Units 3 and 4 Cask Crane Upgrade Project Request For Information (RFI #WGINT-FPL-08-0002) for Clarification of FPL's Position on Tornado Criteria of Class I Structures FPL RESPONSE" June 2,2008
3. FPL Spec C-091, "Turkey Point Units 3 & 4 Fuel Cask Crane Upgrade- Architect/Engineer Scope of Work", Revision 0
4. FPL Spec C-099, "Fabrication of Structural and Miscellaneous Steel"
5. FPL Spec C-004, "Protective Coatings for Areas Outside the Reactor Containment"
6. FPL PC/M 06-011, "ISFSI Haul Path"
7. 0-ADM-717, "Heavy Loads Handling", April 4 , 2008
8. 0-ADM-225, "On line Risk Assessment Management"
9. 0-ADM-217, "Conduct of Infrequently Performed Test and Evolutions", November 10, 2007
10. 0-GMM-102.18, "Implementation Procedure for Heavy Hauls", May 6, 2007
11. 0-ADM-726, "Rigging Operations", August 23, 2007
12. 0-ADM-100.2, "Preparation, Revision, Approval and Use of Temporary Procedures", February 27, 2006
13. "Design Basis Document, Selected Licensing Issues", Revision 11, April 26, 2006
14. Condition Report (CR) 2007-2702, "Potential Enhancements Needed for Handling Heavy Loads at PTN"
15. License Amendment Request #108/102, August 29,1984

Prepared by: Michael C Schmalzer			8/14/2008
(Print Name)	(Sign)		Date
Verified by: JOHN F. GARIBALDI			8-14-08
(Print Name)	(Sign)		Date

Upon completion, this page shall be inserted into and remain with its associated documentation package review and approval process.

Appendix A
10CFR72.48 Pre-Screening

A YES answer to any of the following 10CFR72.48 Pre-Screening questions requires that a 10CFR72.48 screening be performed in accordance with ENG-QI 2.9.

YES	NO	QUESTION
☐	☐	Does the proposed change/activity involve in any manner the dry spent fuel storage cask, the cask transfer/transport equipment or any Independent Spent Fuel Storage Installation (ISFSI) facility SSCs?
☐	☐	Does the proposed change/activity involve in any manner SSCs installed in the plant specifically to support the dry spent fuel storage cask loading/unloading activities?
☐	☐	Does the proposed change/activity involve in any manner the design function, method of performing or controlling the function, or an evaluation that demonstrates that intended function will be accomplished for SSCs[1] needed for plant operation which are also used to support dry spent fuel storage cask loading/unloading activities or ISFSI facility monitoring?
☐	☐	Does the proposed change/activity involve changes to site-specific design criteria for external events such as earthquakes, tornadoes, high winds, flooding, etc.?
☐	☐	Does the change/activity involve changes to plant heavy load program requirements?
☐	☐	Does the activity involve any potential for fire where dry spent fuel storage casks are loaded, unloaded, transported, or stored?
☐	☐	Does the change/activity involve any potential for an explosion hazard where dry spent fuel storage casks are loaded, unloaded, transported, or stored?

[1] Examples of ISFSI Facility interfaces with the 10CFR50 facility SSCs:

- Spent Fuel Pool / Fuel Handling Building Structures and Spent Fuel Pool Cooling System
- Spent Fuel Pool and Fuel Handling Building ventilation system including monitored vent stack
- Spent Fuel Handling Machine range of motion
- Cask Handling Crane
- Cask Handling Facility (CHF)
- Transfer Cask Heavy Haul Path and proximate Fuel Oil storage systems
- Demineralized Water Systems (supply to CHF)
- Instrument and Service Air Systems (supply to CHF)
- Radwaste Floor Drain System (CHF drain)
- Plant Process Computer (ISFSI Temperature Monitoring) - future
- Plant Intrusion Detection Alarm and Closed Circuit Television Monitoring Systems (ISFSI Security Monitoring)
- Offsite Power Supply to CHF (ISFSI Electrical Supply)

FIRE PROTECTION REVIEW CHECKLIST

	YES*	NO	REFERENCES
I. SAFE SHUTDOWN CAPABILITY:			
Does the design change install, relocate, modify, or affect the operation of:			
A. Equipment on the Essential Equip.List	☐	☒	
B. Safe Shutdown Analyses			
1. Safe Shutdown Circuits	☐	☒	
2. Alternate Shutdown Components	☐	☒	
3. Associated Circuits	☐	☒	
4. Manual Actions	☐	☒	
C. (PSL Only) If the answer to A or B is "YES", also review appropriate Appendix R Validation Analysis:			
1. (Unit 1) PSL-ENG-SEMS-98-035	☐	☐	
2. (Unit 2) PSL-ENG-SEMS-98-067	☐	☐	
II. FIRE PROTECTION SYSTEMS			
Does the design change install, modify, or affect the operation of:			
A. Fire Detection Systems	☐	☒	
B. Fire Water Supply System	☐	☒	
C. Water Suppression Systems	☐	☒	
D. Halon Suppression Systems	☐	☒	
E. Standpipe or Hose Stations	☐	☒	
F. Portable Fire Extinguishers	☐	☒	

* Indicate "YES" if an item is impacted or requires justification. If "YES", a section in the modification package shall disposition or justify the item, with the section number referenced accordingly on this form.

	YES*	NO	REFERENCES
III. FIRE RATED ASSEMBLIES			
Does this design change install, modify or affect the function of:			
A. Fire Barriers	☐	☒	
B. Fire Doors	☐	☒	
C. Fire Dampers	☐	☒	
D. Mechanical Penetration Fire Seals	☐	☒	
E. HVAC Duct Penetration Fire Seals	☐	☒	
F. Cable Tray Fire Stops	☐	☒	
G. Structural Steel Fireproofing	☐	☒	
H. Conduit or Raceway Support Fireproofing	☐	☒	
I. Conduit or Raceway Fireproofing	☐	☒	
J. Internal Conduit Fireproofing (Stuffing)	☐	☒	
IV. EMERGENCY LIGHTING			
A. Does the design change install, modify, or affect the operation of?	☐	☒	
B. Does the design change obstruct the required light pattern of?	☐	☒	
C. Does the design change add or relocate essential equipment or components which will require the addition or relocation of?	☐	☒	
D. Does the design change install, relocate, modify, affect, or require the use of handheld emergency lights?	☐	☒	
E. Does the design change relocate, modify, affect, or obstruct the light pattern of perimeter security lighting to equipment requiring manual actions?	☐	☒	

* Indicate "YES" if an item is impacted or requires justification. If "YES", a section in the modification package shall disposition or justify the item, with the section number referenced accordingly on this form.

	YES*	NO	REFERENCES
V. RCP OIL COLLECTION			
Does the design change install, modify, or affect the operation of?	☐	☒	
VI. MISCELLANEOUS			
A. Does the design change affect the quantity or protection of insitu combustibles (solids, liquids, or gases) beyond the assumptions in the FHA?	☐	☒	
B. (PSL Only) Does the design change cause the addition of combustible material within one-foot of an "F-rate" penetration seal as identified in the Fire Protection Penetration Schedules (8770-B-054 or 2998-B-733)?	☐	☐	
C. Does the design change cause the addition of a large combustible inventory within 50 ft. of essential equipment, components, electrical manholes or structures?	☐	☒	
D. Does this design change modify or affect curbs or dikes used to contain combustible liquid spills?	☐	☒	
E. Does this design change cause the removal of a flame-retardant material from non-IEEE-383 cables?	☐	☒	
F. Does this design change affect fire protection program or fire fighting strategies?	☐	☒	
G. Does this design change install, modify or affect the operation of alternate shutdown communications?	☐	☒	
H. Does this design change install, modify, or affect hydrogen lines (or any combustible gas) in areas of the plant containing safe shutdown equipment or components?	☐	☒	
I. Does this design change install, modify, or affect any HVAC equipment or room heat loads in areas of the plant containing Safe Shutdown equipment or components?	☐	☒	

* Indicate "YES" if an item is impacted or requires justification. If "YES", a section in the modification package shall disposition or justify the item, with the section number referenced accordingly on this form.

	YES*	NO	REFERENCES
VI. MISCELLANEOUS *(continued)*			
J. (PSL Only) Does this design change result in the addition of non-IEEE 383 cable? If "YES," then an evaluation in the form of a Fire Protection Evaluation Report (FPER), prepared in accordance with ENG-QI 2.0 is required.	☐	☐	
K. Does this Engineering Package install, modify, or affect a large combustible inventory within 50 feet of the ISFSI haul path?	☐	☒	

Prepared by: A. C. PAL (Print Name) _____ (Sign) 8/14/08 Date

Verified by: D. F. GOLINO (Print Name) _____ (Sign) 8/14/08 Date

* Indicate "YES" if an item is impacted or requires justification. If "YES", a section in the modification package shall disposition or justify the item, with the section number referenced accordingly on this form.

PC/M No. 07-047
Revision 0
Attachment 4

LICENSE RENEWAL REVIEW CHECKLIST

		YES	NO	REFERENCE
I.	**SCOPE**			
	Does the change involve a component or structure within the scope of license renewal?	x		
	For new systems, see ENG-QI 5.3 License Renewal System/Structure Scoping For existing systems, see Tables 5.1-1 and 5.1-2 of the applicable Design Basis document. PTN: DBD 5610-000-DB-001, Volume 0 PSL: Unit 1 DBD-SLI-OLR-1, Volume 20-10 Unit 2 DBD-SLI-OLR-2, Volume 20-7 (If **NO**, Response to Items II though V below is not required.) For Items II, III, IV, and V: Indicate **"YES"** if an item is impacted or requires justification. If **"YES"**, a section of this package shall disposition or justify the item, with the package section referenced.			
II.	**SIX COLUMN TABLES**			
	Does the package require a change to the Six Column Tables described in the "Operating License Renewal" section of the applicable Design Basis Document?		x	
	PTN: DBD 5610-000-DB-001, Volume 0, Tables 5.2-1 through 5.2-60 PSL: Unit 1 DBD-SLI-OLR-1, Volume 20-10, Tables 5.2-1 through 5.2-57 Unit 2 DBD-SLI-OLR-2, Volume 20-7, Tables 5.2-1 through 5.2-55	**NA**	**NA**	
III.	**DRAWINGS**			
	Does the package modify the License Renewal Boundaries on the P&IDs?		x	
V	**AGING MANAGEMENT PROGRAMS**			
	Does the package require a change to program/activities which are credited for aging management for license renewal?		x	
V.	**TIME LIMITED AGING ANALYSES**			
	Does the package require a change to Time Limited Aging Analyses?		x	
	See Table 5.4-1 of the applicable Design Basis Document. PTN: DBD 5610-000-DB-001, Volume 0 PSL: Unit 1 DBD-SLI-OLR-1, Volume 20-10 Unit 2 DBD-SLI-OLR-2, Volume 20-7			

PREPARED BY _____ DATE 8/14/08

VERIFIED BY _____ DATE 8/14/08

PC/M / MSP Pre-Implementation Walkdown Form

PC/M NO. 07-047; Attachment 5 REV. 0 Plant PTN UNIT(S) 3 & 4

DESCRIPTION: Turkey Point Cask Crane - Support Structure Upgrade

Review the feasibility/constructability of the subject PC/M by Field Walkdown to address the following items, as applicable, or other items significant to the implementation.

Potential Installation Impacts	Yes (see Note 1)	No (see Note 2)	Notes
1. Equipment dimensions/envelope		x	
2. Fit-Up with existing equipment	x		Sect. I.8(a)
3. Laydown areas	x		Sect I.8(a)
4. Special tools or test equipment		x	
5. Temporary shielding		x	
6. Availability of services such as air, water, lights, power & HVAC	x		Sect.VI.1 and Specs. SPEC-C-101
7. Anchorages & embedments	x		Sect V.1 and Specs. SPEC-099 & 101 and drawings
8. Coating required	x		Sect.IV.5.16
9. Interferences with installed equipment	x		Sect.I.8(a)
10. Access to and from work site	x		Sect. I.8(a)
11. Rigging/scaffolding requirements	x		Sect.IV.5.17 & 18
12. Welding access		x	
13. Worker safety (during installation and operation)	x		Sect IV.5.17 & 18
14. Fire protection impairments		x	
15. Pre-fabrication & work site preparation requirements	x		Sect. VI.1
16. Cable pulling limitations		x	
17. Equipment Clearance Order (ECO) or special system alignment for installation		x	
18. Maintenance/surveillance accessibility	x		Sect I.8(a)
19. ALARA	x		Attachment 9
20. Security compensatory measures	x		Sect I.8(j)
21. Insulation removal / re-insulation		x	
22. Field routing requirements (e.g., piping, raceway, tubing, wiring)	x		PC/M 07-050
23. Human factors / man-machine interface		x	
24.			
25.			
26.			

(1) YES indicates that the PC/M package affects the item and the item will be addressed in the PC/M.
(2) N/A indicates that the item is not applicable to the proposed activity and will not be addressed in the PC/M.

SIGN-OFF (Signature and Date)

IMPLEMENTOR: _____ **LEAD ENGINEER:** _____

SYSTEM ENGINEER: _____ **OPERATIONS:** _____

MAINTENANCE: _____ **PLANNING:** _____

OTHERS:

_____	_____	_____	_____
Department	Signature	Department	Signature

ENG-QI Form 3H – Human Factors Engineering (HFE) Screening Checklist

Title: Turkey Point Cask Crane – Support Structure Upgrade

Brief Description of Activity: Upgrade of existing structural steel supported on the Auxiliary Building roof on the West side and isolated foundations on the East side and modification of the foundations.

The following questions should be answered **Yes** or **No** to determine if Human Factors Engineering (HFE) considerations should be evaluated for the proposed modification. If any of the answers are **Yes**, then the applicable HFE design features shall be evaluated in accordance with the guidance provided in Engineering-QI 1.10.

1. Does the modification change the layout of the control room, control board, operator console, or remote shutdown panel?	☐ YES ☒ NO
2. Does the modification install new equipment in the control board, operator console, or remote shutdown panel?	☐ YES ☒ NO
3. Does the modification add new equipment that requires operator local control for off-normal or emergency operating procedures?	☐ YES ☒ NO
4. Does the modification affect the access of existing equipment required for operator action?	☐ YES ☒ NO
5. Does the modification affect operator response (alarms, equipment failures, or off-normal conditions)?	☐ YES ☒ NO
6. Does the modification affect the method in which an operator interfaces with a control system or data system?	☐ YES ☒ NO
7. Does the modification affect the environment (temperature, humidity, lighting, noise) of the control room, remote shutdown panel, or any location where operator action is required for off-normal conditions?	☐ YES ☒ NO
8. Does the modification involve changes to existing operator computer displays?	☐ YES ☒ NO
9. Does the modification involve color coding, labeling, scaling, or displays that are different than the plant's existing standard conventions?	☐ YES ☒ NO

Preparer: A. C. PAL (Print Name) _____ (Sign) 8/14/08 Date

Reviewed by: John Warren (Print Name) _____ (Sign) 8/14/08 Date

Upon completion, this page shall be inserted into and remain with its associated documentation package review and approval process.

ENVIRONMENTAL QUALIFICATION (EQ) CHECKLIST

1. ELECTRICAL EQUIPMENT	Yes *	No
a) Does the modification add, modify or replace electrical/I&C equipment or affect any EQ Doc Pac? If NO, then proceed to Section 2.	☐	☒
b) Is the equipment located in a harsh environment per EQ Doc Pac 1000 (PSL) or 1001 (PTN)? If NO proceed to Section 2.	☐	☒
c) Does the equipment perform a safety related function?	☐	☒
OR		
Does the equipment perform a quality related function such that its failure could mislead an operator or adversely affect any safety related function required to mitigate or monitor an accident?	☐	☒
OR		
Is the equipment classified as Category 1 or 2 by RG 1.97?	☐	☒

*** If the answer to any question in Section 1.c is YES, then the equipment is subject to 10CFR50.49 and the design package must justify that the equipment is Environmentally Qualified.**

2. ENVIRONMENTAL CONDITIONS	Yes**	No
a) Does the modification add, relocate, raise flow rate of, or increase radiation levels of any piping containing radioactive liquids such that lifetime or accident exposure of electrical equipment may be increased?	☐	☒
b) Does the modification add or reroute any high energy piping, the failure of which could impinge upon electrical equipment or increase the post-break local pressure or temperature?	☐	☒
c) Does the modification alter process fluid characteristics such that the post accident pressure, temperature, pH, or boron concentration to which electrical equipment will be exposed may be changed?	☐	☒
d) Does the modification alter any barriers that shield electrical equipment from high energy lines or radiation exposure?	☐	☒
e) Does the modification add equipment to containment or increase the post-LOCA makeup water inventory such that the design basis containment flood level may be increased?	☐	☒

**** If the answer to any question in Section 2 is YES, then it must be determined if any equipment subject to 10CFR50.49 could be impacted and, if so, that its Environmental Qualification is still valid. Document the determination in the design package.**

Prepared by: John Warren (Print Name) _____ (Sign) 8/14/08 Date

Verified by: A. C. PAL (Print Name) _____ (Sign) 8/14/08 Date

UFSAR CHANGE PACKAGE (FCP) COVERSHEET

Plant TURKEY POINT Unit 3 & 4

UFSAR PAGES ATTACHED:

5A-3, 5A-17

UFSAR FIGURES ATTACHED:

N/A

COMMENTS: N/A

A.C. PAL 8/14/08
Prepared by/Date:

Verified by/Date:

Approved by/Date:

Notes:

1. All affected UFSAR pages (text and tables) shall be legibly marked-up and attached. If additional space is required to address the bases for the comment, then additional pages should be attached. New information for inclusion in the FSAR shall also be marked-up and attached.

2. If a figure is provided elsewhere in the design package, then it need not be duplicated in this FCP. However, a note should be provided in the comment section above listing the associated UFSAR figure(s) that are affected by the design package. This also applies to new drawings which should be added to the UFSAR. If a new figure or figure revision is to be included in the FCP, then a copy of the UFSAR figure with a bubble around the affected area is sufficient.

UPDATED FINAL SAFETY ANALYSIS REPORT
TURKEY POINT UNITS 3 & 4
LIST OF EFFECTIVE PAGES

VOLUME 2 (Continued)

PAGE	REV
CHAPTER 5 (cont'd)	
Figure	
5.1-18	0
5.1-19(Sh1)	0
5.1-19(Sh2)	0
5.1-19(Sh3)	0
5.1-19(Sh4)	0
5.1-19(Sh5)	0
5.1-20	0
5.1-21	13
Text	
5.2.1-1	2
5.2.3-1	16
5.2.3-2	0
5.2.4-1	09/29/2005
5.3.1-1	05/24/2004
5.3.2-1	10
5.3.3-1	10
5.3.4-1	09/29/2005
5.3.4-2	10
5.3.4-3	10
5.3.4-4	10
5.3.4-5	10
5.3.4-6	10
5.3.4-7	05/24/2004
5.3.4-8	10
5.3.4-9	10
5.3.4-10	05/24/2004
5.3.4-11	10
5.3.4-12	10
5.3.4-13	10
5.4.1-1	0
5.4.2-1	16
5.4.3-1	16
Table	
5.4.3-1	16
Text	
5.5.1-1	6

APPENDIX 5A	
Text	
5A-1	14
5A-2	14
5A-3	~~09/10/2005~~
5A-4	09/19/2005
5A-5	16
5A-6	15
5A-7	06/26/2002
5A-8	15
5A-9	14
5A-10	16
5A-11	17
5A-12	15
5A-13	15
5A-14	14
5A-15	09/14/2007
5A-16	09/14/2007
5A-17	~~09/14/2007~~
Table	
5A-1	0
5A-2(Deleted)	14
5A-3	0

INSERT SECT. 8.b

07/11/2008

07/11/2008

Revised 09/14/2007

7. Emergency Diesel Generators
   - Engine, generator, fuel skid
   - Fuel day tanks
   - Fuel storage tanks
   - Fuel transfer pumps
   - Air start receivers
   - Associated piping

   NOTE: Load combinations for Class I structures, as supplemented by more recent criteria for Seismic Category I structures listed in Section 5.3.4.2, were used in the design of the Unit 4 EDG Seismic Category I structures. See Section 5.3.4.3 for specific design criteria.

INSERT 8.a. Containment Polar Crane and Rail Support
The containment polar crane and associated rails are seismically qualified Class I structures in the unloaded configuration. These structures are also seismically qualified in all plant operating modes for a maximum load lift of 1,760 lbs by either hoist of the polar crane.

INSERT

9. Refueling Water Storage Tanks

10. Emergency Containment Cooling and Filtering Units

11. Intake Cooling Water Systems
   - Intake structure and crane supports
   - Intake cooling water pumps and motors
   - Intake cooling water piping, from pumps to component cooling water heat exchanger inlets
   - Basket strainers
   - Intake cooling water piping up to, and including, the turbine plant cooling water (TPCW) heat exchanger isolation valves POV-*-4882 and POV-*-4883 are seismically qualified to ensure the pressure integrity of the ICW system

12. Component Cooling System
   - Component cooling heat exchangers
   - Component cooling pumps and motors
   - Component cooling surge tanks
   - Component cooling head tank

8. b. CASK HANDLING CRANE SUPPORT STRUCTURE

THE CASK HANDLING CRANE SUPPORT STRUCTURE WILL MAINTAIN INTEGRITY UNDER ALL SEISMIC LOADING CONDITIONS AND IS QUALIFIED AS CLASS I STRUCTURE IN THE CASK HANDLING CONFIGURATION.

5A-6.0 REFERENCES

5A-1 Westinghouse WCAP-14276,"Turkey Point Units 3 and 4 - Uprating Licensing Report," Revision 1, dated December 1995.

5A-2 Westinghouse WCAP-14237, Technical Justification for Eliminating Large Primary Loop Pipe Rupture as the Structural Design Basis for the Turkey Point Units 3 and 4 Nuclear Power Plants," dated December 1994.

5A-3 Shock and Vibration Handbook, edited by Harris and Crede, Volume 3 Chapter 50: "Vibration of Structures Induced by Seismic Waves," by George W. Housner.

INSERT

5A-4 ASCE Paper No. 3269 "Wind Forces on Structures."

5A-5 NRC letter, from R. P. Croteau (NRC) to J. H. Goldberg (FPL),"Turkey Point Units 3 and 4 - Approval to Utilize Leak-Before-Break Methodology for Reactor Coolant System Piping (TAC Nos. M91494 and M91495)," dated June 23, 1995.

5A-6 "Plant Specific Seismic Adequacy Evaluation of Turkey Point Units 3 and 4 to Resolve unresolved Safety Issue (USI) A-46 and Generic Letter (GL)87-02", Stevenson & Associates, April 30, 1993 (number 90C1585D).

ALARA SCREENING

1. Is this PC/M administrative only (no physical modifications)?

_____ yes, Further ALARA screening is not required.

__x__ no, **Continue screening.**

2. Does this PC/M involve a location in a Radiation Controlled Area (RCA)?

__x__ yes, Location: Aux. Bldg. Roof and east Yard area **continue screening.**

_____ no, Further ALARA screening is not required.

3. Does the implementation, operation, or maintenance of this PC/M involve:

__No__ Movement of radioactive material?

__No__ Modification of systems containing radioactive fluids or resins such that routing or retention characteristics are affected?

__No__ Movement/modification of existing permanent radiation shielding?

__No__ Modification or removal of equipment that results in an uncontrolled opening/penetration into a High Radiation Area, Locked High Radiation Area, Very High Radiation Area, or Exclusion Area?

__No__ Diving associated with systems containing radioactive material?

__No__ Entrance into containment during power operation?

__No__ Potential for personnel exposure to a radiation field of ≥ 1r/hour (assuming current area dose rates)?

__No__ A total lifetime estimated dose due to the modification greater than or equal to one (1) man rem?

If any item in Section 3 above is checked "yes", indicate "yes" below:

____ yes, This PC/M has the potential to significantly impact personnel radiation exposure. Complete Form 72 to ensure total radiation dose is minimized by design. Coordinate with Radiation Protection.

__x__ no, This PC/M has little or no impact on personnel radiation exposure. Form 72 not required, however, normal ALARA precepts should be followed to minimize radiation exposure.

Prepared: _____ Verified: _____

** Leave signatures blank if same as on PC/M coversheet **

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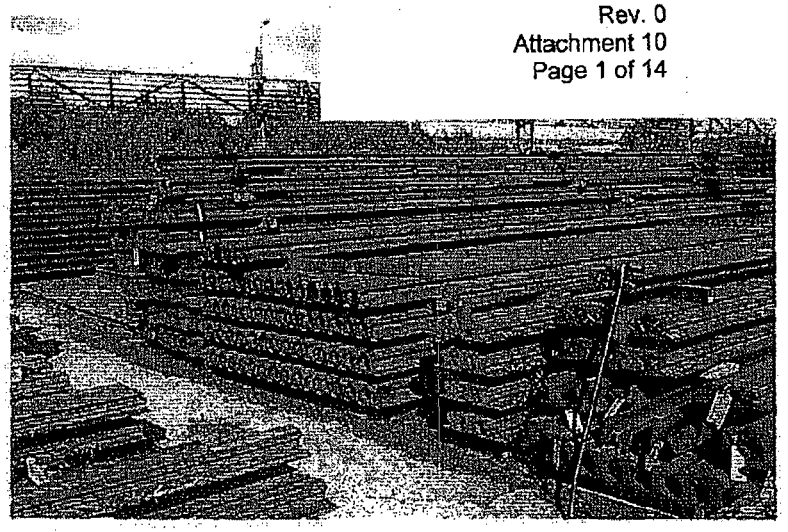
Rail - a key component of the crane support system

Rail going through the ultra-sonic testing machine.



Our access to large rail inventories can provide short delivery times.

Gantrex has over 30 years of experience in assisting in the selection of rail profiles to suit numerous and varied applications on both steel and concrete supported runways.

Since a rail profile is the surface on which cranes and other material handling machines operate, it is a most fundamental element of the structure: In general, the rail selection must satisfy criteria such as reliability, economy and life expectancy. We can assist in selecting the rail characteristics to meet specific design parameters. Gantrex is supported by an experienced Engineering staff and associated rail mill technical expertise, backed by university testing and dedicated laboratories. Our calculations, dimensioning and diagnoses are all essential elements required to choose a rail to ensure longevity of the crane support structure.

Our technical and sales specialists further contribute by designing the most efficient crane support system (ie., rail profile, clips, pad, soleplates, epoxy grout and anchor bolts). In addition, an experienced field group provides project and design coordination, supervision and rail welding (flash butt, thermite and puddle arc) capabilities.

Depending on the individual customer requirements (quantity, grade, profile and delivery), Gantrex is normally in a good position to provide rail from local stock, preferred suppliers or directly from the mill.

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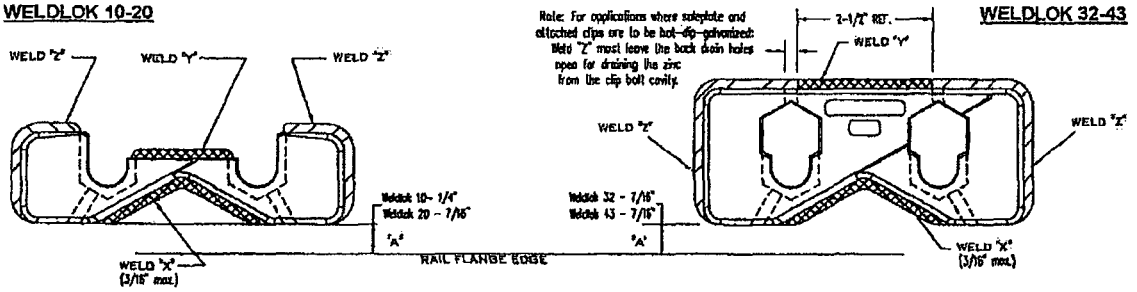
WELDLOK SERIES
SUGGESTED WELD AND INSTALLATION INSTRUCTIONS

Weldlok™ 10, 20, 32 & 43 weldable clips

SUGGESTED WELD

- The lower component of the GANTREX Weldlok Series clip is welded to the support structure. The weld size in the V-shaped recess on the side facing the rail, must not exceed 3/16". This will avoid any interference with the locating lug on the upper component. Welds on the back and sides of the clip may be as large as required to accommodate the imposed side thrust and to meet governing welding code requirements.
- The following are welds suggested by GANTREX. The actual weld size (which is dictated by design thrust) and the welding procedure should be specified by the designer.

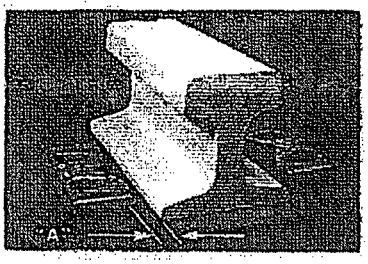


WELD	SIZE	SIDE THRUST CAPACITY (Lbs/Clip)			
		WELDLOK 10	WELDLOK 20	WELDLOK 32	WELDLOK 43
X + Y	3/16"	10,000	7,500	10,200	10,200
X + Y + Z	3/16"	13,000	12,000	22,000	22,000

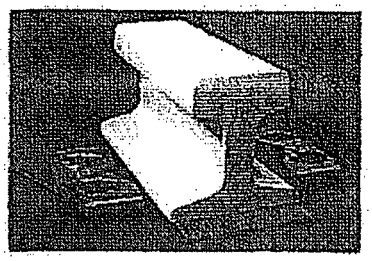
- WELDLOK 10 SERIES - The maximum side thrust capacity of 17,000* lbs can be obtained by increasing (Weld "Y" & "Z") to 1/4".
- WELDLOK 20 SERIES - The maximum side thrust capacity of 20,000* lbs can be obtained by increasing (Weld "Y" & "Z") to 3/8".
- WELDLOK 32 SERIES- The maximum side thrust capacity of 32,000* lbs can be obtained by increasing (Weld "Y" & "Z") to 1/4".
- WELDLOK 43 SERIES - The maximum side thrust capacity of 43,000* lbs can be obtained by increasing (Weld "Y" & "Z") to 3/8".

NOTE: Side thrust capacities shown above are based on allowable weld stress of 15,000 psi for up to 100,000 full load cycles. AISC requires a reduction for up to 500,000 cycles and a further reduction for up to 2,000,000 cycles.

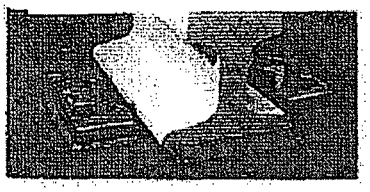
SUGGESTED WELD AND INSTALLATION INSTRUCTIONS WELDLOK™ 10, 20, 32 & 43 RAIL CLIPS



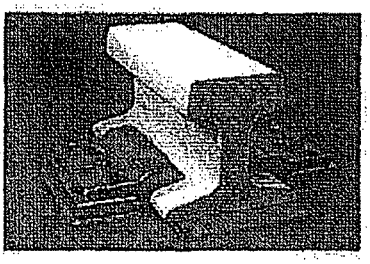
1. Position lower component with gap "A" as shown and tack weld in place.



2. Weld as shown on the fabrication drawing, ensuring that the clip lower does not lift.

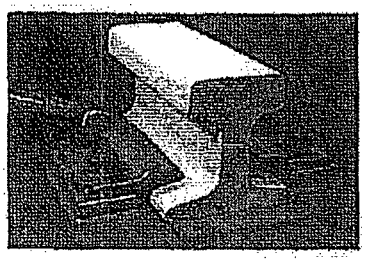


3. After installing bolts, make sure they are pushed as far forward as possible.

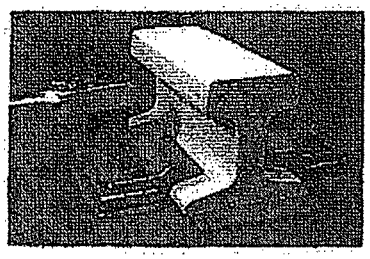


4. Install upper component.

5. Install washers and nuts finger tight.



6. Adjust upper component to ensure tight contact with rail flange edge.



7. Torque nuts as shown in table.

CLIP	BOLT	TORQUE ft lbs	"A" DIMENSION (ins)
WELDLOK 10	1/2" Dia Gr 5	75	1/4"
WELDLOK 20	3/4" Dia Gr 5	250	7/16"
WELDLOK 32	M20 HHCS x 35	180	7/16"
WELDLOK 43	3/4" Dia Gr 5	250	7/16"

- The correct bolt assembly consists of a Grade 5 hex head capscrew with A325 structural nut and washer.
- The correct bolt assembly for the Weldlok 32 consists of a modified M20 HHCS x 35mm screw with a 20 mm jam nut and 3/4" hardened structural washer.
- Weld rod: any low hydrogen rod suitable for use with structural steel may be used. Typical designations include E7018.
- Clips should be installed in opposing pairs. They should NEVER be staggered.
- For new installations the lower component should be welded in the fabrication facility (steps 1 and 2).
- Welding should be completed prior to pad installation, as excessive heat could damage the pad.
- Painting the lower component may reduce side thrust capacity.

It is imperative that the clips be adjusted to ensure ZERO lateral rail float as shown in Figure 6. Improper adjustment will cause pad failure. Verification of the required hardware torque and clip upper adjustment should be performed within the first three months of running operation.

For clarification on any of the above or for more comprehensive suggestions on repair or rerail projects, consult GANTREX.

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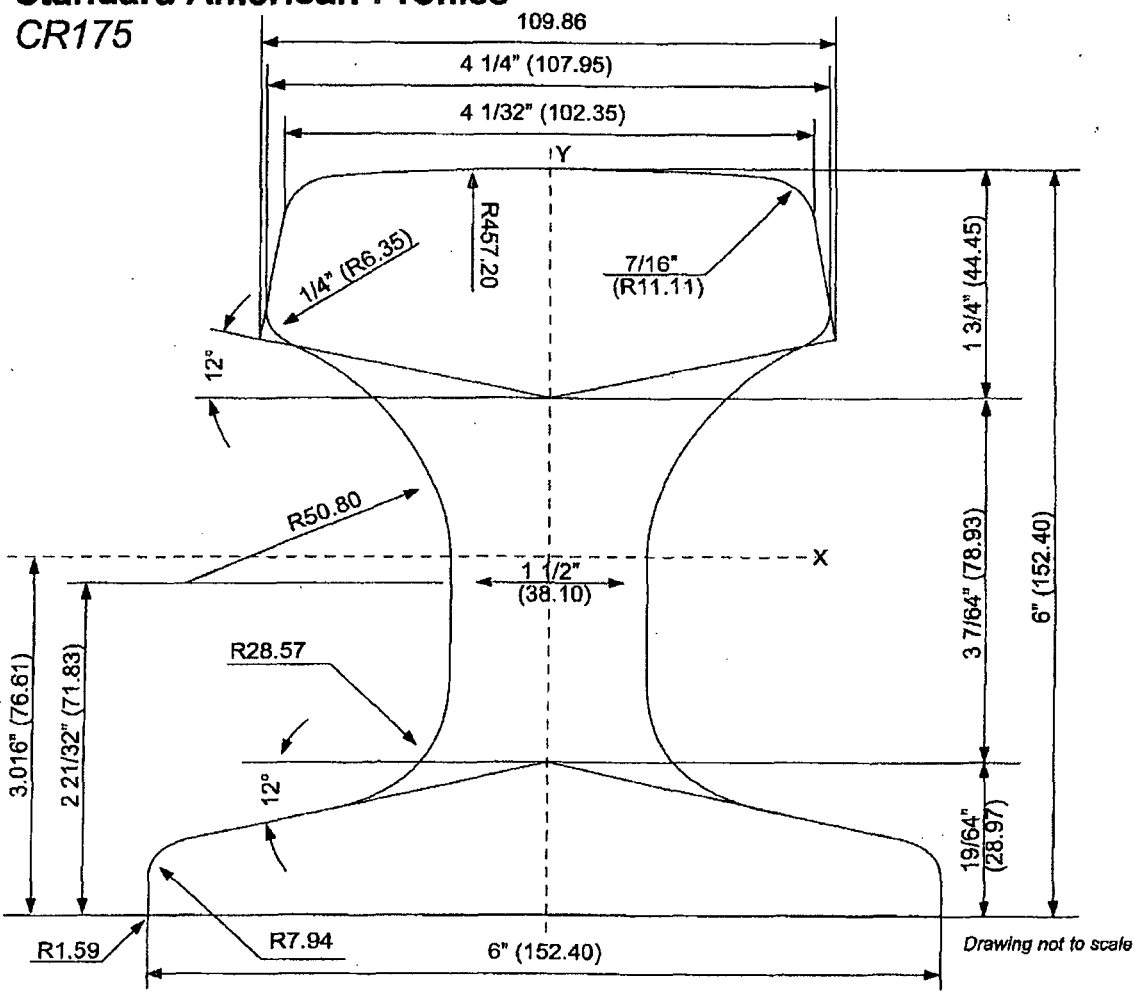
Crane Rails

Standard American Profiles*

CR175



Technical Data

Nominal weight: 175.0 lb/yd (86.80 kg/m)
Area: 17.12 in² (110.45 cm²)
Moment of Inertia: 70.22 in⁴ (2923.00 cm⁴)
Sec. Modulus-Head: 23.28 in³ (381.49 cm³)
Sec. Modulus-Base: 23.50 in³ (385.70 cm³)

* *Consult Gantrex for clips and pad selection.*

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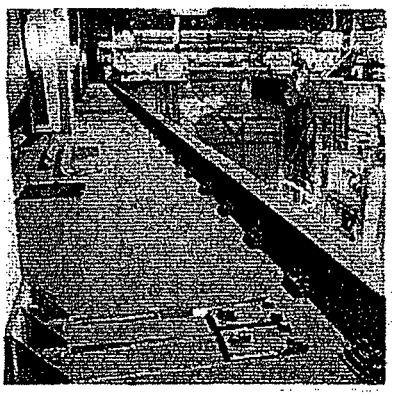
Crane Rails

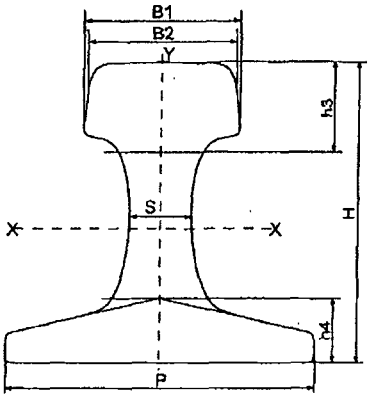
Standard American Profiles*



Crane Rails under American Standards (CR 104 through CR 175) are rolled based on the technical specifications ASTM A759-2000 and are offered in either Standard Grade or in Head Hardened.

The standard length of these rails is 39'. Gantrex can supply 60' and 78' lengths as well, depending on customers requirements.

The ASTM A759-2000 specification is applied only to type CR crane rails with a nominal mass of 104 lb/yd (51.6 kg/meter) to 175 lb/yd (86.8 kg/meter)



Designation

	Weight		B1		B2		S		P		H		h3	h4
	lbs/yd	kg/m	in	mm	in	mm	in	mm	in	mm	in	mm	in	in
CR104	104.0	51.59	2 1/2	63.5	2 1/2	63.5	1	25.4	5	127.0	5	127.0	1 1/2	1 1/16
CR105	105.0	52.09	2 9/16	65.1	2 9/16	65.1	15/16	23.8	5 3/16	131.8	5 3/16	131.8	1 25/32	1
CR135	135.0	66.97	3 7/16	87.3	3	76.2	1 1/4	31.7	5 3/16	131.8	5 3/4	146.0	1 7/8	1 1/16
CR171	171.0	84.83	4.3	109.2	4	101.6	1 1/4	31.7	6	152.4	6	152.4	2	1 1/4
CR175	175.0	86.80	4 1/4	107.9	4 1/32	102.4	1 1/2	38.1	6	152.4	6	152.4	1 3/4	1 9/64

Consult Gantrex for rail clip and pad selection.

Chemical Composition (%)

Elements				
C	Mn	P (max)	S (max)	Si (max)
0.67 - 0.84	0.70 - 1.10	0.040	0.0450	0.10 - 0.50

Mechanical Properties

Grade	Brinell Hardness	Tensile strength (approximate)
standard	typical min. 260*	min. 127 ksi
head hardened	min. 321 - max. 388	min. 157 ksi

** ASTM A759/200 does not indicate a minimum Brinell hardness.*

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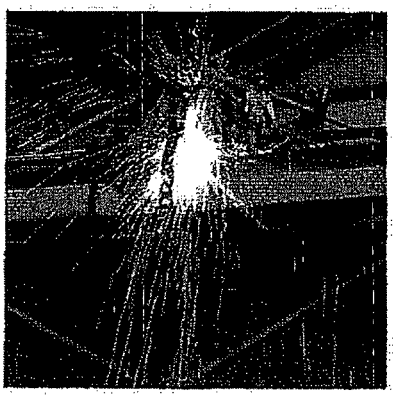
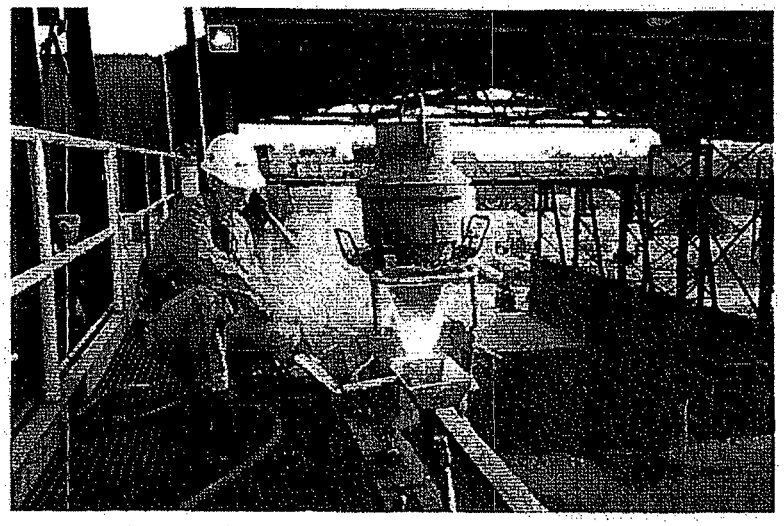
Rail - a key component of the crane support system



Gantrex Flash-Butt Welding Overhead Rail.



Thermite welding in action.

A number of different rail welding processes have been used to produce efficient crane runways. Gantrex has the history, experience and capability to field weld using Puddle Arc, Calorite Thermal and Flash-Butt procedures. Below is a short overview of the mostcommon methods:

Puddle Arc - an electro-slag process used extensively in Europe where it lends itself to the joining relatively low carbon"A" rails. It is skill dependent, where weld is puddled into the rail gap and retained by "coppers" matched to the rail profile. The "coppers" are individually shaped by the welder to match his own "puddling" technique. Puddle Arc Welding can result in a good joint, but is dependent of the skill of the welder. It also creates a larger heat-affected zone than thermal or flash-butt rail welding. Battering can be a problem on higher cycle runways. Larger profiles may take up to 10 hours per weld. Not commonly used today.

Calorite Thermal - a thermal-slag process using a chemical heat source. Rail ends are square cut and sand molds are set on the sides and bottom of the rail. After preheat of the ends, a thermal charge is ignited in a crucible and the molten steel allowed to flow into the cavity. The rail ends are joined via a casting during the welding process. This weld is good, affords portability and 4-5 welds can be made by a two man crew in a normal shift.

Flash-Butt - technically, the best weld. It produces the smallest heat affected zone, minimizing joint batter, and uses electric current and hydraulic rams to butt the rail ends together at the upset temperature. As many as 4 welds per hour may be possible for overhead runways and 4-6 welds per hour for ground tracks. This system is most effective when the rail is fed from a fixed location and advanced down the runway on rollers. Used on runways where all the rail is replaced.

GANTREX
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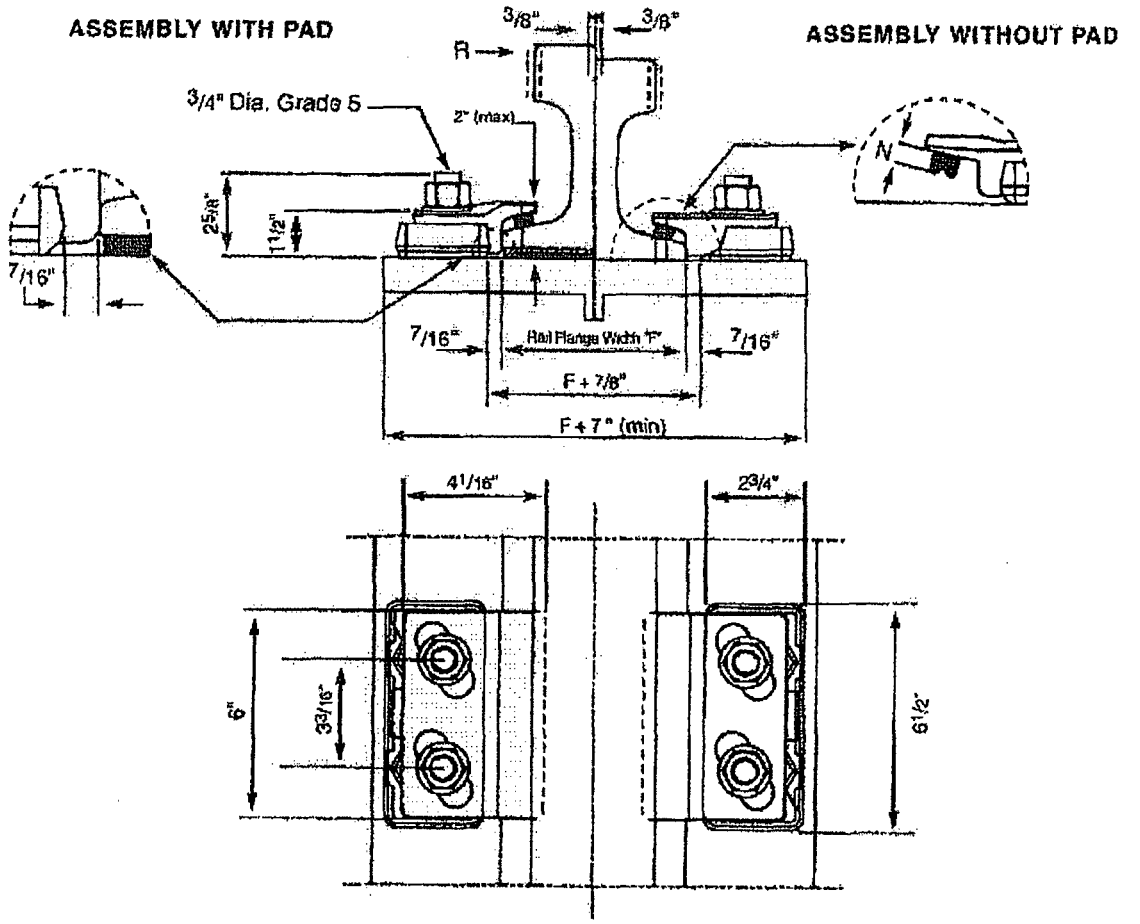
WELDLOK SERIES

Weldlok™ 43 weldable clip



SPECIFICATIONS		
• Resistance to lateral force R max.		43 kips
• Bolt torque		250 ft-lbs
• Lateral adjustment, total		3/4"
• "N" available noses		1/2", 5/8"
• Weight	standard	7.5 lbs
	cast "Z"	8.3 lbs

NOTES

See "Selection Table" for "F" Dimensions.
See "General Specifications Weldlok Series" for additional clip information.

COMPONENTS

WELDLOK 43

1 upper component (forged) No. 9220\20\33
or 1 upper component (forged) No. 9220\20\36
or 1 upper component (forged) No. 9220\20\41
or 1 upper component (cast "Z") No. 9220\20\46
1 lower component No. 9219\--\25
2 Gr. 5 hex capscrews, 3/4" Dia. X 2"
2 A325 hex nuts, 3/4" Dia.
2 hardened structural washers, 3/4" Dia.

GANTREX RAIL CLIP WELDLOK™ 43

SELECTION TABLE					
RAIL SIZE (lbs/yd)	F (IN)	RAIL ONLY CLIP PART NO.	GANTREX PAD MODEL NO.	RAIL ON GANTREX PAD CLIP PART NO.	AT SPLICE BAR CLIP PART NO.
85 ASCE	5 3/16"	Consult GANTREX	130 RFS	WELDLOK 43/85P	WELDLOK 43C (4 per joint)
104 CR	5"	WELDLOK 43/104	130 RFS	WELDLOK 43/104P	
105 CR	5 3/16"	WELDLOK 43/105	130 RFS	WELDLOK 43/105P	
135 CR	5 3/16"	WELDLOK 43/135	130 RFS	WELDLOK 43/135P	
171 CR	6"	WELDLOK 43/171	150 RFS	WELDLOK 43/171P	
175 CR	6"	WELDLOK 43/175	150 RFS	WELDLOK 43/175P	

See specification "Weldlok Clip Series" for general information.

NOTES

8) The Weldlok 43 is standard with a forged steel upper component and vulcanize-bonded rubber nose. An alternative cast ductile iron upper component cab be specified by adding suffix "Z" (e.g. Weldlok 43/135Z). Use suffix "S" where the low cost option of a mechanically fastened rubber nose is required (e.g. Weldlok 43/105S).
9) To order clips without rubber noses consult GANTREX for proper selection.
10) GANTREX clips are available to suit most rail sections. Please consult GANTREX for details if your rail does not appear in the above table.
11) GANTREX recommends that rail joints be welded wherever possible.
12) If **vertical clearance** is a problem, 1 3/4" long bolts may be substituted for standard 2" long bolts, in which case the overall clip height reduces to 2 3/8". Ask GANTREX for information on **extra low profile** clips.
13) Narrow lower components (Weldlok 10 Series and Weldlok 20 Series) are available for special applications. Consult GANTREX for details, or refer to Weldlok 10 or 20 Series literature sheets.
14) Contact GANTREX for available protective coatings.

MATERIALS

Upper Component ..... Forged Steel or Ductile Cast Iron
Lower Component ..... Weldable Forged Steel
Pressure Block (Nose) ..... Synthetic Rubber

INSTALLATION

The lower component is welded to the support parallel to the axis of the rail and the upper component fastened to it by means of two 3/4" Dia. Grade 5 hex head capscrews. For full instructions, refer to GANTREX Weldlok 10, 20, 32 & 43 Series Suggested Weld and Installation Instruction sheet. Do not use cleaning fluids or protective coatings which contain ketones or similar chemicals, as they may seriously damage the rubber nose.

For complete crane runway installation services including rail welding, please contact GANTREX SYSTEMS through any of the sales offices listed below.

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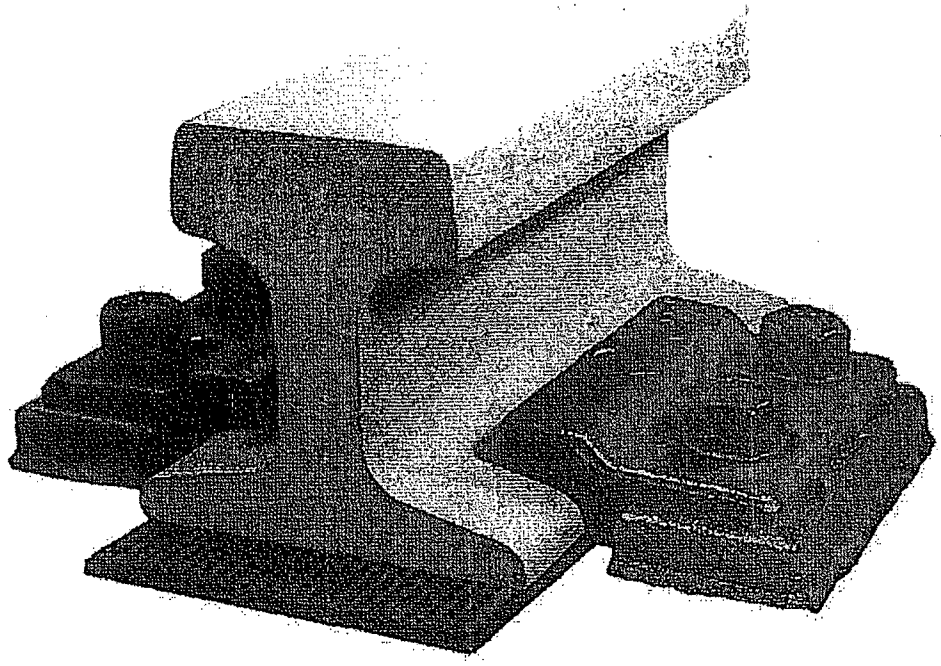
GENERAL SPECIFICATIONS WELDLOK SERIES

Weldlok™ Series weldable clip



The GANTREX crane rail soft-mounting system consists of a range of synthetic rubber pads, which are laid under the rail, and a range of resilient crane rail clips which locate the rail.

Individual data sheets on the various GANTREX pads and clips give details of the unique characteristics and geometry of each product.

This general specification describes the weldable Weldlok series clips.
The "boltable" clips are described in the Stelcam series general specification sheet.
The rail pads are described in the MK6 pad specification.

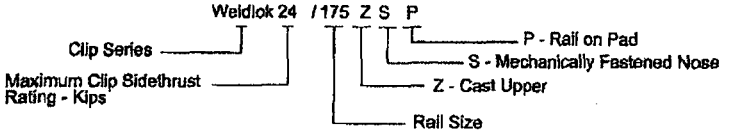
GENERAL CHARACTERISTICS

All GANTREX Weldlok series patented clips are specifically designed for the mounting of crane rails, with or without pad. A full range of weldable clips is available to the designer to optimize the economy as well as the technical integrity of the installation.

All Weldlok clips consist of two interacting components which allow easy lateral rail adjustment and, once correctly installed, are self-locking and self-tightening. A controlled vertical force is applied to the rail flange through a synthetic rubber "nose", which is vulcanize-bonded (or mechanically fastened) to the appropriate clip component.

CLIP IDENTIFICATION AND NUMBERING SYSTEM

The GANTREX Clip numbering system applies to most current products and concisely describes the product as illustrated below:



TECHNICAL ADVANTAGES OF GANTREX CLIPS

- Simple and positive lateral rail adjustment of up to 3/4" (20mm), depending on type of clip.
- Self-locking and self-tightening features through a system of double wedging action.
- Very high resistance to lateral loads through careful selection of clip component materials.
- Controlled vertical force applied to rail through synthetic rubber "nose":
  - accommodates rail and girder tolerances
  - eliminates fatigue effects on bolt
  - ensures contact between rail and pad under the rail
  - controls axial movement of broken rail
  - eliminates loosening of bolts
- Minimizes crane runway maintenance and down time.
- Reduces noise and vibration.

STANDARD RANGE OF CLIPS

See data sheet on specific clip series for details. All GANTREX clips are available in various heights, with optional "nose" thicknesses to accommodate all rail sizes with and without pad.

MAXIMUM ALLOWABLE SIDE LOAD (R) FOR STANDARD CLIPS

CLIP	R MAX IN KIPS
WELDLOK 10	17
WELDLOK 15	15
WELDLOK 18	18
WELDLOK 20	20
WELDLOK 24	24
WELDLOK 32	32
WELDLOK 43	43

See data sheet on specific clip for details

CLIP SELECTION

The following information must be available in order to select the correct GANTREX clip for your installation:

- rail designation (e.g. 85 ASCE, 175 CR)
- thickness of pad or wear plate under the rail
- maximum side thrust per wheel
- vertical clearance tolerances where side rollers are used
- girder top flange width
- lateral adjustment required
- maximum wheel load

Please consult GANTREX if the girder is not simply supported.

INSTALLATION INSTRUCTIONS

See data sheet on specific clip for details. A standard option on all GANTREX clips is protection against corrosion in the form of electro or hot-dip galvanizing. The lower part which must be welded cannot be galvanized prior to welding. Bolts shall be coated with zinc chromate. Where further painting is required, please consult GANTREX before using mineral-based solvents. Do not use cleaning fluids or protective coatings which contain ketones or similar chemicals, as they may seriously damage the rubber nose.

CLIP SPECIFICATION

The data sheet for each clip gives the following details:

- clip size and weight
- model designation for selected rail sizes
- resistance to side load (R)
- lateral adjustment range

Please contact GANTREX for more information on any GANTREX product or for clip specification if your rail size does not appear in the tables on the data sheet tables.

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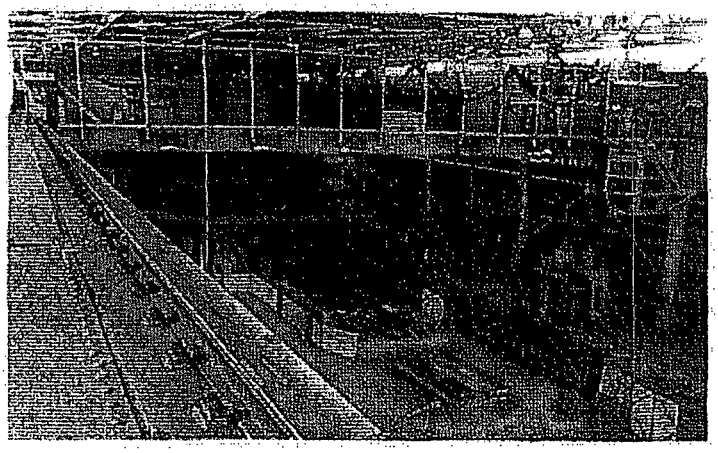
Crane Rail Fastening Systems



INTRODUCTION

The ever growing demands by industry for increased automation and higher plant output rates resulted in the development of generation after generation of higher speed, heavier duty modern bridge cranes. While mechanical engineers concentrated their efforts on designing bigger and more efficient cranes, structural engineers maintained an equivalent pace in improving crane girder, support structure and foundation designs. Between these two fields of expertise lies the crane rail, which represents the hinge point of the installation. Traditional rail mounting methods have, in general, not kept pace with the increasing demands made on them.

The result can be that this relatively inexpensive area, in terms of initial outlay and design, can cause considerable operating expenses and problems. These problems manifest themselves by high wear rates in wheels, bearings, axles and rails. High maintenance costs and significant down time are the ultimate result.

In the longer term, the impact and vibration transmitted to the girder structure and foundations result in structural damage and possible girder failure due to fatigue.

FATIGUE

The area of contact between a steel rail and the top flange of a steel crane girder can be as little as one percent of the projected area of the rail. Since both the rail and girder are stiff in compression, even heavy wheel loads will not substantially increase the contact area, and very large local stresses result. To compound this problem, these contact points are randomly distributed, leading to complex and indeterminate stress patterns in the supporting girder. The continuously moving and shock loads, produced by the operations of the crane can result in fatigue and consequent damage to both the crane rail and the girder. The most common manifestation is cracking in the upper portion of the girder web.

Where rails are mounted on concrete, a similar rationale applies with resulting progressive disintegration of the concrete and loosening of the hold down bolts.

CRANE RAIL MOUNTING

The GANTREX crane rail soft mounting systems have developed over 35 years in an effort to reduce the all too frequent problems associated with crane rail installations. Today's line of mounting pads and clips are sophisticated, proven and easy to install. They result in reduced mechanical wear, lower impact forces from shock loading, less vibration and a quieter operation. These systems consist of steel reinforced, vulcanized, synthetic rubber pads and resilient clips designed specifically for the mounting of crane rails in light, medium or heavy duty applications.

CRANE RAIL CLIPS

FEATURES	BENEFITS
• Lateral adjustability	• Absorbs initial rail tolerances • Facilitates future re-railing & realignment
• Positive lateral rail restraint	• Keeps pad fixed laterally • Ensures constant rail alignment • Reduces crane skewing effects
• Self-locking	• When torqued to specified recommendation, bolts will never loosen and are locked in place • Side thrust will never overcome frictional resistance of the self-locking design
• Synthetic nose permanently bonded to clip upper component	• Prevents bolts from being overstressed from tension and fatigue, by absorbing the uplift of the rail due to the 'bow wave' effect • Allows predictable, controlled longitudinal rail movement due to temperature changes and normal crane acceleration and braking • Precompresses pad, resulting in intimate contact between the rail, pad and girder, minimizing wear

RESILIENT PAD

FEATURES	BENEFITS
• Vulcanized synthetic rubber material of construction	• Resists wear, as well as oil & grease • Reduces noise • Eliminates indeterminate concentrated loads by compensating for the uneven surfaces of the bottom of the rail & top of girder • Centers the wheel load to reduce flexural stresses in the girder top flange-to-web connection • Allows controlled transverse mobility of the rail head, which reduces stress levels during wheel flanging, and absorbs the angular misalignment between rail head and wheel tread • Life expectancy of the pad is normally 2-3 times the rail life • Extends life of the rail, girder, crane wheels and bearings • Eliminates fretting corrosion between rail and girder top flange • Extends life of electrical components on the crane
• Ribbed construction	• Gives the pad a double-angled load/deflection curve which allows it to be pre-compressed by the rail clip but support high wheel loads without resulting in high flexural stresses in the rail • Compression of the pad under the wheel load does not result in pad elongation, instead, the grooves fill as the wheel load increases
• Edge seals	• Prevents the ingress of dirt and water which can cause premature failure of the pad, rail and support structure
• Steel reinforcement	• Minimum 90% steel width prevents longitudinal tears typical in fiber pads • Provides lateral rigidity, to prevent extrusion from under the rail • Stiffens the pad under heavy wheel loads to reduce bending stress in the rail

GANTREX PATENTS

Australia - 645.903, Canada -2,066,344, China - ZL92103467.9, EPC-0,512,974, India - 180588, Japan - 116399/92, Korea - 92-7851, Mexico - 179,749, S. Africa - 92/1056, Taiwan -99777, USA -5,135, 165.
Additional U.S. and International Patents on products are pending or applied for.

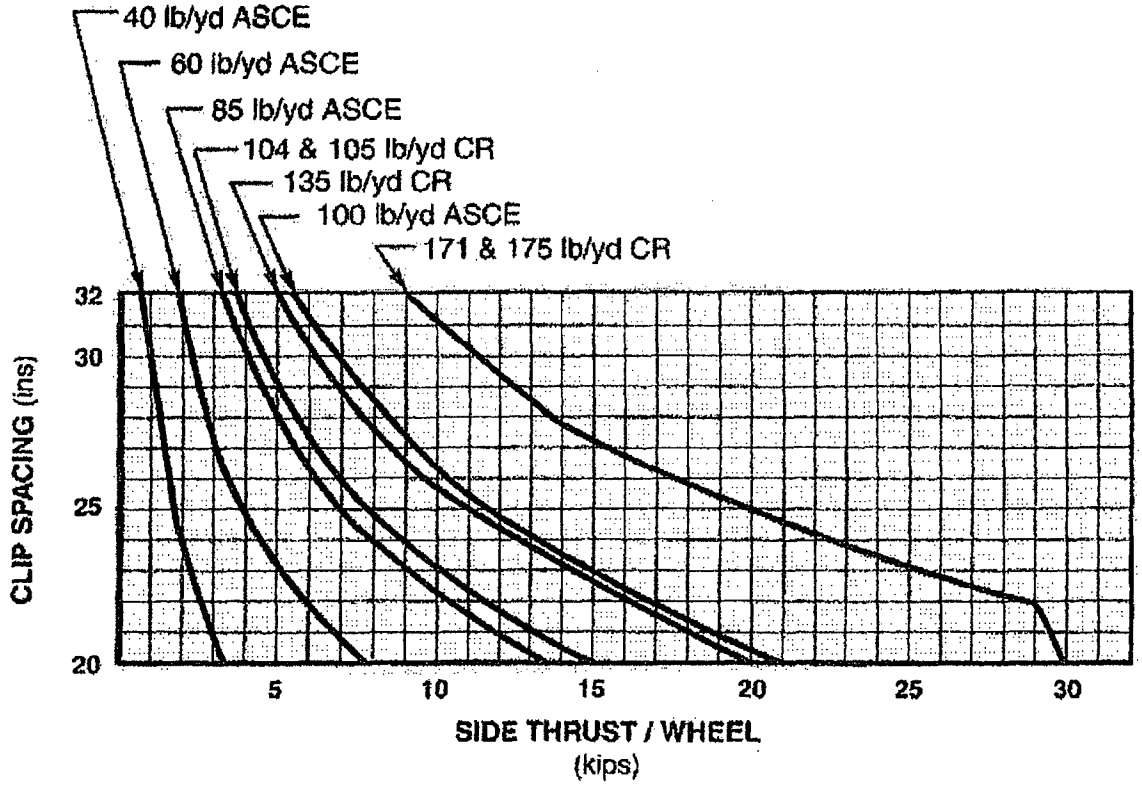
NOTE: Please complete the Application Data Sheet that follows and then contact your local GANTREX sales office with your specific requirement.

GANTREX
A Member of the GANTRY GROUP

Clip Spacing Guide

CONTINUOUSLY SUPPORTED RAIL ON GANTREX PAD

The graph is based on a horizontal load (side thrust) of 15% of vertical wheel load and a rail yield stress of 75 ksi.



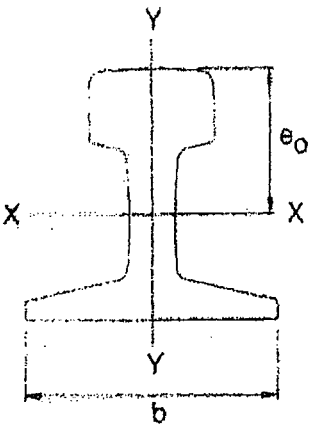
CONTINUOUSLY SUPPORTED RAIL WITHOUT GANTREX PAD

Gantrex suggests that the clip spacing calculation be based on rail with pad to allow for future pad installation. If pad is never to be used, consult Gantrex for a clip spacing recommendation.

GANTREX CLIP SPACING GUIDE

RAIL DATA (NORTH AMERICAN)

RAIL SIZE (lbs/yd)	I_{xx} (ins^4)	I_{yy} (ins^4)	e_0 (ins)	a (ins^2)	b (ins)	S (ins)
40 ASCE	6.54	2.00	1.94	3.94	3.50	8.65
60 ASCE	14.56	4.40	2.20	5.93	4.25	10.07
85 ASCE	30.07	7.70	2.72	8.33	5.19	11.48
100 ASCE	43.97	13.20	3.02	9.84	5.75	12.31
104 CR	29.84	8.56	2.57	10.29	5.00	11.57
105 CR	34.41	9.40	2.98	10.30	5.19	11.38
135 CR	50.82	12.07	2.95	13.32	5.19	13.09
171 CR	73.40	23.80	3.38	16.81	6.00	13.84
175 CR	70.51	21.65	3.34	17.12	6.00	13.70



For rail sizes not shown on the graphs, consult Gantrex or determine spacing from the following formulae:

$$\text{Let } l' = \text{max clip spacing} = \sqrt[3]{\frac{0.48\ E\ I_{yy}}{H \times 10^3}} \text{ ins.}$$

$$\text{and check that } f_V + f_H + f_T \not> 45{,}000 \text{ psi}$$

$$\text{Where } f_V = \frac{V e_0 \times 10^3}{4\ I_{xx}} \text{ psi}$$

$$f_H = \frac{0.1707\ H l' b \times 10^3}{2\ I_{yy}} \text{ psi}$$

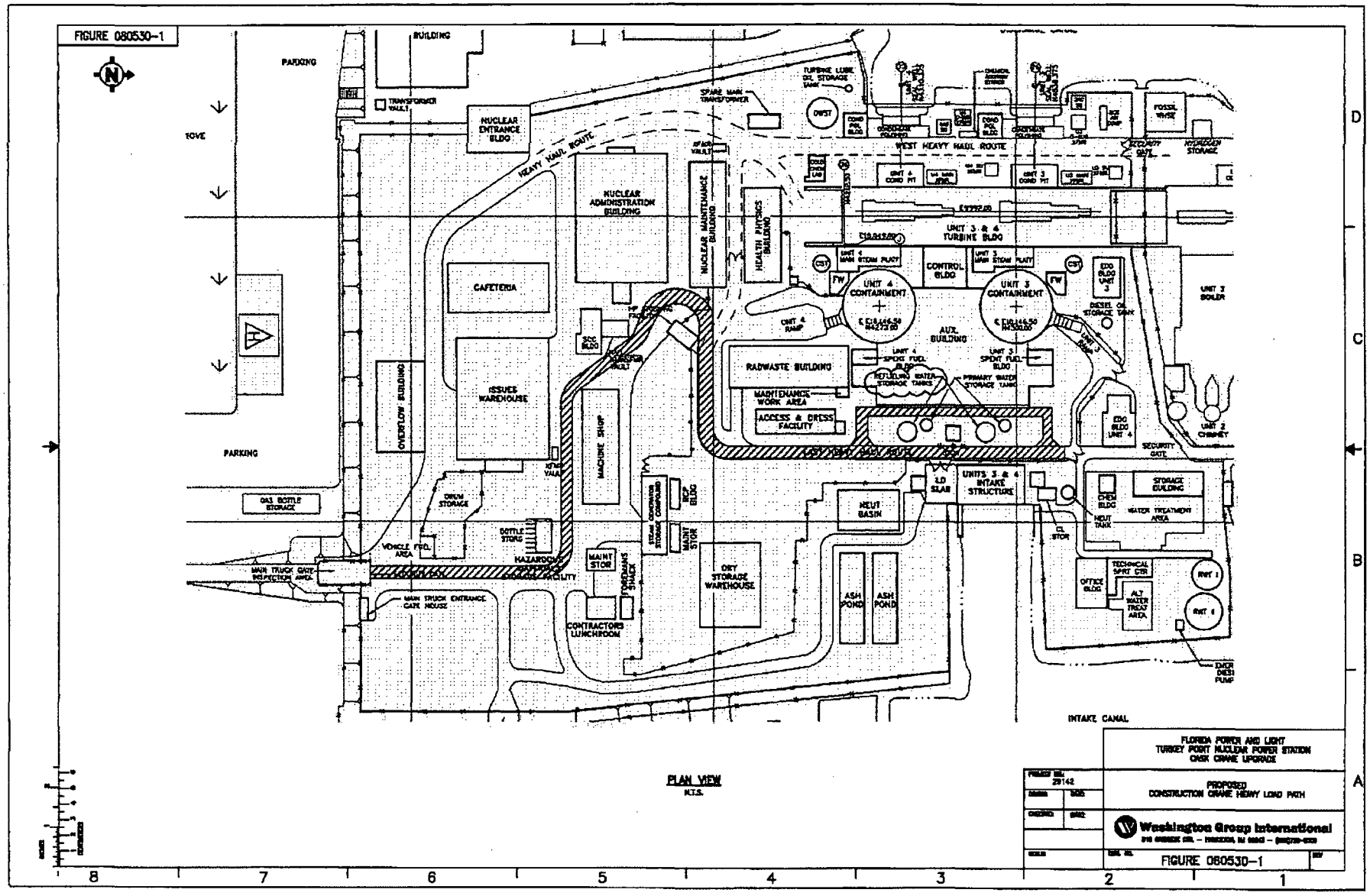
$$f_T = \frac{T}{A} \text{ psi}$$

V = Vertical wheel load, kips
H = Horizontal (side thrust) load, kips
T = Longitudinal load, kips

$$S = \text{Characteristic length of rail} = \sqrt[4]{\frac{4\ E\ I_{xx}}{bk}} \text{ ins}$$

k = Pad stiffness = 40,000 lbs/in^3 (average value)
b = Rail flange width, ins.
a = cross-sectional area of rail, ins^2

NOTE: If H is greater than 15% V, or greater than the value shown at 20" spacing for the rail in question, consult GANTREX.



PC/M 07-047, REV. 0
ATTACHMENT NO. 11
PAGE 1 OF 1

URS

Washington Division

WHITE PAPER

FOR

CONSTRUCTION, ERECTION AND RIGGING (CER) OVERVIEW OF THE TURKEY POINT CASK CRANE SUPPORT STRUCTURE MODIFICATIONS

PREPARED FOR

FLORIDA POWER & LIGHT CO.
FPL - P.O. 00100862-REL.001

URS - WASHINGTON DIVISION
PROJECT NO. 29142-001
DOCUMENT NO. 080515-01
REVISION 0
14 AUGUST 2008

FORWORD

WGInt's scope for the Turkey Point Unit #3 and #4 Cask Crane Upgrade is limited to analysis, engineering & design of modifications, plant change/modification package preparation, procurement support for fabrication drawings and field support during construction. WGInt scope does not include construction services in terms of construction planning, scheduling or other construction management services associated with the mobilization, deployment, supervision or support of craft personnel during modification of the crane steel support structure.

WGInt's effort with respect to construction/erection and rigging given herein is based on the industry convention that the constructor has authority and responsibility for the details associated with the planning and execution of the steel support structure modifications. In fact, such details are an essential component of the Constructor's planning strategy formulated at the time he prepares his proposal.

WGInt's effort in developing construction/erection and rigging information for PCM 07-047 given herein is to establish that the proposed modifications to the steel support structure are constructible with the units on line, and to provide a modification sequence in broad terms and other references to assist the Constructor with the formulation of his construction plan and bid for the services. WGInt provides descriptions of typical approaches for construction and examples of how the approaches might be implemented in terms of standard industry techniques.

1.0 BACKGROUND

In support of Florida Power and Light's (FP & L) implementation of an Independent Spent Fuel Storage Installation, the cask handling crane will be upgraded to 130 / 25 ton main / auxiliary hook capacity and will meet the single failure-proof criteria of NUREG-0554.

This requires upgrade of the current crane support structure to a Seismic Category 1 (Class I) SSC with the safety classification upgraded from Quality related to Nuclear Safety Related.

The support structure upgrade will be performed in the radiologically controlled area (RCA) which is congested and has operational limitations due to the presence of Safety Related equipment and systems as well as restrictive limitations on the weights of loads that can be handled in the work area.

2.0 ISSUES AND OBJECTIVES

The purpose of this paper is to provide an overview of the construction, erection and rigging requirements for installation of the crane support steel modifications and to identify potential problem areas or issues.

3.0 CONSTRAINTS AND ASSUMPTIONS

As of this writing an overall approach to the structure and foundation modifications has been developed but the final details are still evolving.

Additionally, the CER scheme acknowledges the desire for the new crane supplier to have only a single mobilization for both removal of the existing crane and installation of the new crane.

Normally this type of assessment is performed by the by the constructor / erector contractor as part of that bid preparation. Since URS-Washington Division is not the constructor / erector, the level of detail provided herein is limited and speculative because of changes desired by the selected contractor. However, the provided detail is in keeping with sequences and construction details typically found in modification packages at FP & L facilities and within the nuclear industry.

4.0 MODIFICATION OVERVIEW

The nature and extent of the modifications to be made to the existing support structure are shown on Figure 1.

5.0 PTN LIFTING AND RIGGING CONSTRAINTS

Several areas of challenge are imposed on the construction, erection and rigging activities associated with implementation of the modifications. Some of the major ones are:

- The presence of Safety Related equipment and systems.
- Congestion of the work areas.
- Limited access to the work areas for use of construction equipment.
- Compliance with the Heavy Load Handling requirements and limitations. TPN procedure 0-ADM-717 Attachments 1 and 9 (copies attached) depict restricted load handling areas in the vicinity of the modifications.

6.0 ERECTION SEQUENCE OVERVIEW

A multi-phased approach is recommended to promote efficient construction and installation activities. Using the recommended phase groupings also provides FP&L latitude in selection of a single construction contractor or use of multiple subcontractors.

- PHASE I – East side runway foundations excavation and concrete placement
- PHASE II – West side runway foundation anchor drilling and member installation
- PHASE III – East side runway bents and trusses
- PHASE IV – West side runway bents and trusses
- PHASE V – Spent Fuel Building roof trusses
- PHASE VI – Removal of existing crane
- PHASE VII – Installation of new crane

These Phases are presented in more detail in Attachment 1.

7.0 IDENTIFIED AREAS AND ISSUES OF CONCERN

- Presence of unidentified underground systems and obstructions at the pile locations
- Staging locations for materials on the Auxiliary Building roof
- Cumulative weights of materials staged on the Auxiliary Building roof
- Rigging materials into the staging and installation positions within the requirements of 0-ADM-717
- Compliance with personal fall protection tie-off requirements while working on top of the runway girders

8.0 OPTIONS AND ALTERNATIVES

- Use of the same or equivalent crane that is already approved to service the stack near Unit 4. Study the existing evaluation used for that crane for application along the length of the superstructure.
- Place a temporary crane on the existing cask crane trolley girders
- Develop a design for temporary lifting device(s) that can be placed on the existing runway girders
- Develop a design for temporary lifting device(s) that can be situated on the existing trolley girders

- Install a tower crane situated on the East side of the East runway capable of reaching all work locations

9.0 SUGGESTED PATH FORWARD

- Perform underground survey at the pile locations using ground penetrating radar
- Perform exploratory excavation in the areas of new piles and pile caps
- Compile and study historical evaluations already existing for handling heavy loads over the Auxiliary Building roof
- Revise TPN procedure 0-ADM-717 to show more refined load travel limitation boundaries on the Auxiliary Building roof and the vicinity of the Refuel Water Storage Tanks
- Identify specific cribbing pile locations for staging material on the Auxiliary Building roof
- Develop a system of structural channel tracks and Hillman rollers to stage/move/position members on the Auxiliary Building roof
- Design prefabrication assembly configurations that do not exceed 5 tons
- Perform an Engineering study of the feasibility of installing and using a tower crane
- Contact crane vendors for input of suitable crane that could be placed on existing crane trolley girders. (This would require design of a proper support structure on the existing trolley girders for the temporary crane.)
- Identify specific locations on the Auxiliary Building roof for placement of mobile man-lifts needed to access work locations
- Perform a comparison of studies of the various crane and lifting device options

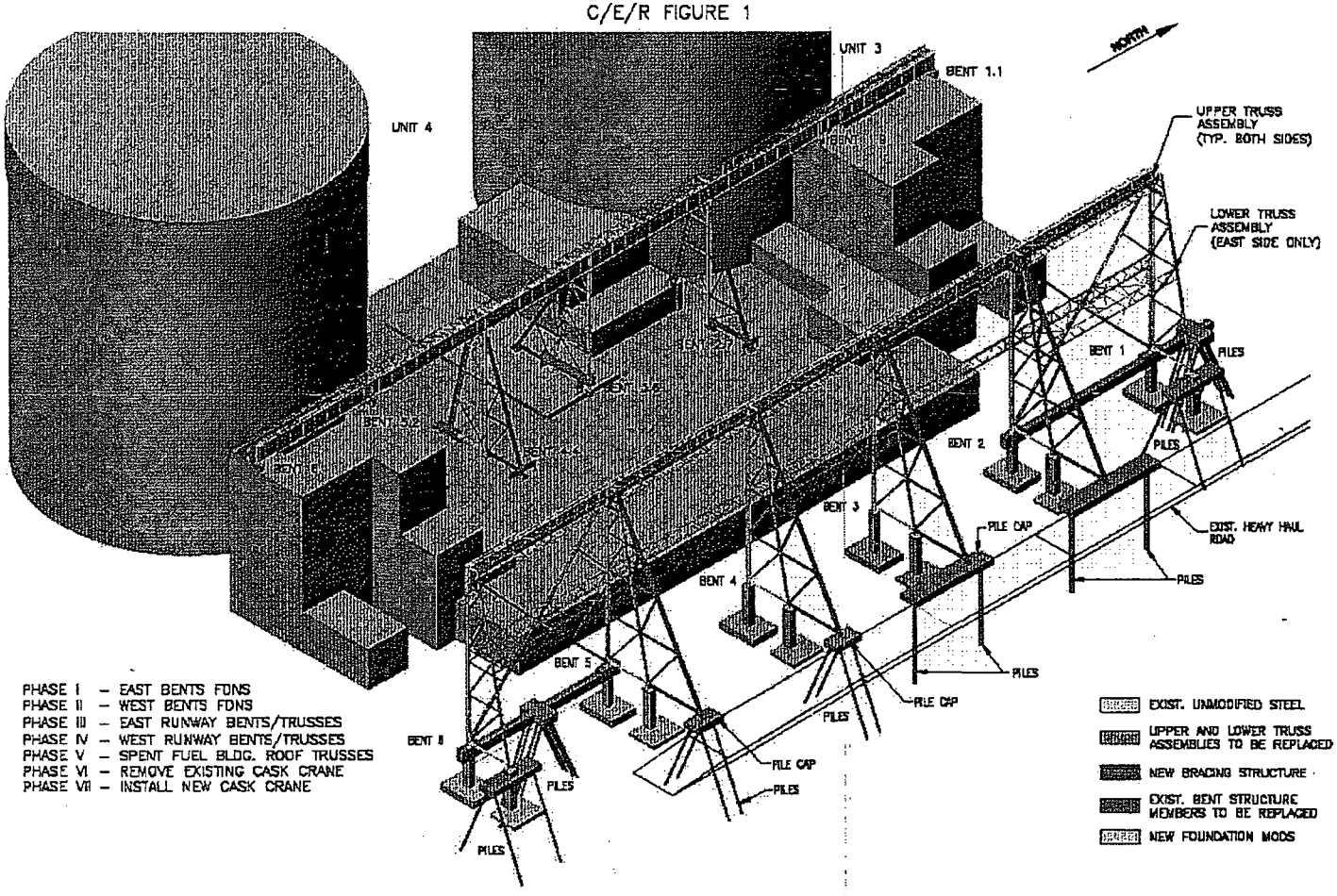
10.0 FIGURES

- C/E/R Figure 1
- Heavy Load Handling Diagram for Spent Fuel Cask Handling Crane (Extracted from FPL 0-ADM-717, Page 50)
- Safe Load Path for Mobile Crane/Hoisting Rigs Diagram (Extracted from FPL 0-ADM-717, Page 59)

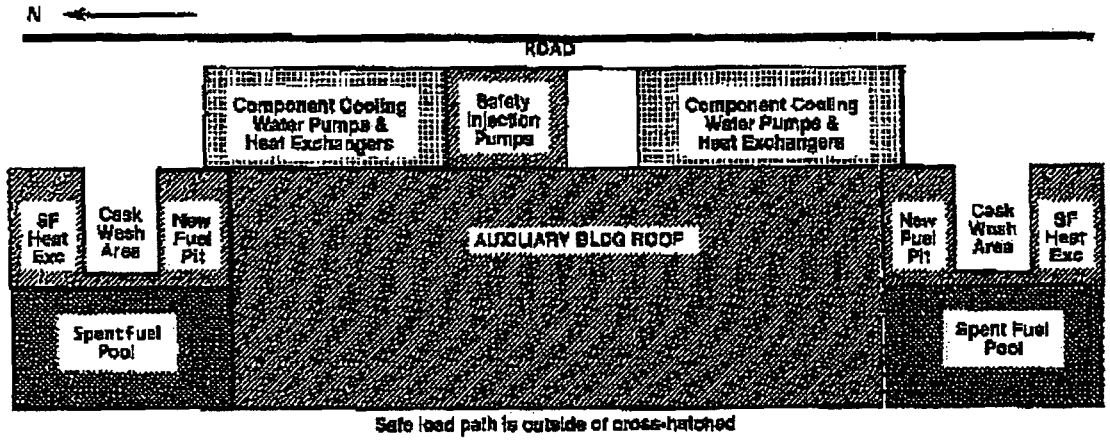
11.0 ATTACHMENTS

- Construction/Erection/Rigging (CER) Sequence
- Weights of New Steel Members and Assemblies

C/E/R FIGURE 1


NORTH
UNIT 3
UNIT 4
BENT 1.1
UPPER TRUSS ASSEMBLY (TYP. BOTH SIDES)
LOWER TRUSS ASSEMBLY (EAST SIDE ONLY)
BENT 1
BENT 2
BENT 3
BENT 4
BENT 5
BENT 8
PILES
PILE CAP
EXIST. HEAVY HAUL ROAD
PHASE I – EAST BENTS FDNS
PHASE II – WEST BENTS FDNS
PHASE III – EAST RUNWAY BENTS/TRUSSES
PHASE IV – WEST RUNWAY BENTS/TRUSSES
PHASE V – SPENT FUEL BLDG. ROOF TRUSSES
PHASE VI – REMOVE EXISTING CASK CRANE
PHASE VII – INSTALL NEW CASK CRANE
EXIST. UNMODIFIED STEEL
UPPER AND LOWER TRUSS ASSEMBLIES TO BE REPLACED
NEW BRACING STRUCTURE
EXIST. BENT STRUCTURE MEMBERS TO BE REPLACED
NEW FOUNDATION MODS

ATTACHMENT 1
(Page 1 of 1)
SPENT FUEL CASK HANDLING CRANE



Safe load path is outside of cross-hatched

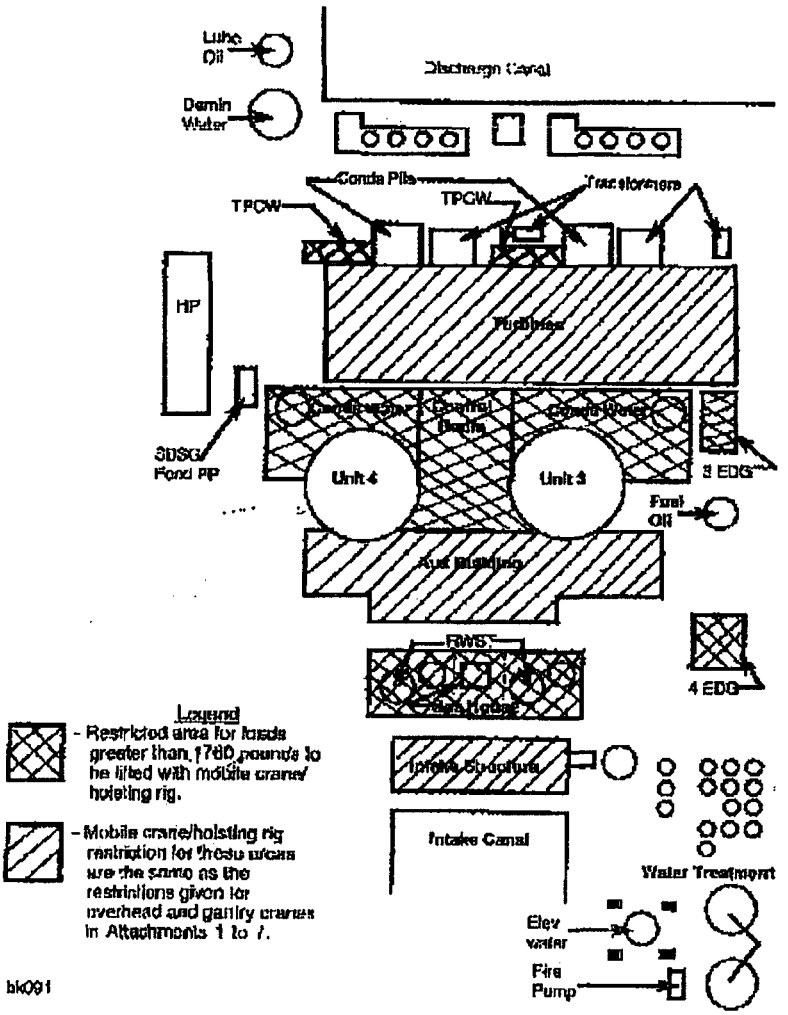
Legend:
- Restricted area for handling of loads greater than 5 tons
- Restricted area for handling of loads greater than 2000 pounds, except as allowed in accordance with Step 5.1.2
- Restricted area for handling of loads greater than 1760 pounds

NOTES:
1. The spent fuel cask shall not be moved into the spent fuel pit until all the spent fuel in the pit has decayed for a minimum of 1,525 hours.
2. Only a single element cask may be moved into the spent fuel pit.
3. A fuel assembly shall not be moved from the spent fuel pit in a shipping cask until it has decayed for a minimum of 120 days.

JDP/sw/attach

Procedure No.	Procedure Title:	Page: 59
S-ADM-717	Heavy Load Handling	Approval Date: 7/22/04

ATTACHMENT 9
(Page 1 of 1)
SAFE LOAD PATH FOR MOBILE CRANES/HOISTING RIGS



ATTACHMENT 1

CONSTRUCTION/ERECTION/RIGGING (CER) SEQUENCE

INTRODUCTION

This attachment provides the recommended construction/erection/rigging sequence arranged so as to maintain the structural integrity of the existing crane support superstructure during implementation of the modification.

While the sequence reflects the foreseen order needed to accomplish that, there are some activities that may be performed independent of the sequenced order.

These INDEPENDENT ACTIVITIES are defined as having all of the following attributes:

1. It is new structure/material, and
2. Its installation has no negative impact on the structural integrity of the existing superstructure, and
3. It may be worked regardless of the position of the existing cask crane, and
4. It has no prerequisite structural work, and
5. They may be worked individually, within groupings or all simultaneously.

The activities that satisfy this definition are annotated as "INDEPENDENT ACTIVITY" in bold font at the end of the sequence step at which they appear. These activities may be completed in any order but must all be completed prior to starting any removal/replacement of existing structure members.

Additionally, the East and West side superstructures may be treated as independent of one another.

1.0 GENERAL NOTES

1.1 All field work shall comply with the Florida Power and Light Safety Program.

1.2 All field work shall satisfy the requirements of the applicable Florida Power and Light construction procedures for performing excavations, placement of concrete and grout, rigging and handling operations, structural steel erection, welding, concrete anchor installation, and coating.

1.3 Coordinate with Plant Security for removal and reinstallation of sections of delay fencing.

1.4 Coordinate activities with the Radiation Protection Department and comply with the appropriate Radiation Work Permit.

1.5 Refer to Attachment 2 for Figures and Tables showing the weights of new steel members and assemblies.

2.0 PHASE I - EAST SIDE RUNWAY FOUNDATIONS

2.1 Excavate, auger and place reinforcing steel, formwork and concrete for the piles located North of Bent 1. **(INDEPENDENT ACTIVITY)**

2.2 Excavate, auger and place reinforcing steel, formwork and concrete for the piles at Bent 1. **(INDEPENDENT ACTIVITY)**

2.3 Excavate, auger and place reinforcing steel, formwork and concrete for the piles located between Bent 5 and Bent 6. **(INDEPENDENT ACTIVITY)**

2.4 Excavate, auger and place reinforcing steel, formwork and concrete for the piles at Bent 6. **(INDEPENDENT ACTIVITY)**

2.5 Excavate, auger and place reinforcing steel, formwork and concrete for the piles at Bent 5. **(INDEPENDENT ACTIVITY)**

2.6 Excavate, auger and place reinforcing steel, formwork and concrete for the piles at Bent 4. **(INDEPENDENT ACTIVITY)**

2.7 Excavate, auger and place reinforcing steel, formwork and concrete for the piles at Bent 3. **(INDEPENDENT ACTIVITY)**

2.8 Excavate, auger and place reinforcing steel, formwork and concrete for the piles at Bent 2. **(INDEPENDENT ACTIVITY)**

2.9 Excavate, place reinforcing steel and concrete for the pile cap North of Bent 1 and the grade beam spanning between it and Bents 1 and 2. **(INDEPENDENT ACTIVITY)**

2.10 Excavate, place reinforcing steel and concrete for the pile cap located at the East side of Bent 1. **(INDEPENDENT ACTIVITY)**

2.11 Excavate, place reinforcing steel, embedments and concrete for the pile cap located at the East side of Bent 2. **(INDEPENDENT ACTIVITY)**

2.12 Excavate, place reinforcing steel, embedments and concrete for the pile cap located at the East side of Bent 3. **(INDEPENDENT ACTIVITY)**

2.13 Excavate, place reinforcing steel, embedments and concrete for the pile cap located at the East side of Bent 4. **(INDEPENDENT ACTIVITY)**

2.14 Excavate, place reinforcing steel, embedments and concrete for the pile cap and beam spanning between Bent 5 and Bent 6. **(INDEPENDENT ACTIVITY)**

2.15 Excavate, place reinforcing steel, embedments and concrete for the pile cap located at the East side of Bent 5. **(INDEPENDENT ACTIVITY)**

2.16 Excavate, place reinforcing steel, embedments and concrete for the pile cap located at the East side of Bent 6. **(INDEPENDENT ACTIVITY)**

3.0 PHASE II - WEST SIDE RUNWAY FOUNDATIONS

3.1 Drill holes for the through bolts of the new side plates at Bent 1.1. **(INDEPENDENT ACTIVITY)**

3.2 Install the new side plates and through bolts at Bent 1.1. **(INDEPENDENT ACTIVITY)**

3.3 Drill holes for the through bolts of the new side plates at Bent 1.9. **(INDEPENDENT ACTIVITY)**

3.4 Install the new side plates and through bolts at Bent 1.9. **(INDEPENDENT ACTIVITY)**

3.5 Drill holes for the through bolts of the new side plates at Bent 5.2. **(INDEPENDENT ACTIVITY)**

3.6 Install the new side plates and through bolts at Bent 5.2. **(INDEPENDENT ACTIVITY)**

3.7 Drill holes for the through bolts of the new side plates at Bent 6.1. **(INDEPENDENT ACTIVITY)**

3.8 Install the new side plates and through bolts at Bent 6.1. **(INDEPENDENT ACTIVITY)**

3.9 Drill and install new anchor bolts and base plates at Bent 2.7. **(INDEPENDENT ACTIVITY)**

3.10 Grout new base plates at Bent 2.7. **(INDEPENDENT ACTIVITY)**

3.11 Install new foundation members at Bent 2.7. **(INDEPENDENT ACTIVITY)**

3.12 Drill and install new anchor bolts and base plates at Bent 3.6. **(INDEPENDENT ACTIVITY)**

3.13 Grout new base plates at Bent 3.6. **(INDEPENDENT ACTIVITY)**

3.14 Install new foundation members at Bent 3.6. **(INDEPENDENT ACTIVITY)**

3.15 Drill and install new anchor bolts and base plates at Bent 4.4. **(INDEPENDENT ACTIVITY)**

3.16 Grout new base plates at Bent 4.4. **(INDEPENDENT ACTIVITY)**

3.17 Install new foundation members at Bent 4.4. **(INDEPENDENT ACTIVITY)**

4.0 PHASE III - EAST SIDE RUNWAY

NOTE: For lifting of members to be performed using a mobile crane located on the haul route road, ensure crane is placed so as not to move any load or crane boom over the Refueling Water Storage Tanks (RWST) unless an engineering evaluation has been approved by FP & L.

4.1 Install the new column cover plates on Bent 1. **(INDEPENDENT ACTIVITY)**

4.2 Install the new column cover plates on Bent 2. **(INDEPENDENT ACTIVITY)**

4.3 Install the new column cover plates on Bent 3. **(INDEPENDENT ACTIVITY)**

4.4 Install the new column cover plates on Bent 4. **(INDEPENDENT ACTIVITY)**

4.5 Install the new column cover plates on Bent 5. **(INDEPENDENT ACTIVITY)**

4.6 Install the new column cover plates on Bent 6. **(INDEPENDENT ACTIVITY)**

4.7 Park the cask crane at the south end of the support structure.

4.8 Remove the existing brace members on Bent 1.

4.9 Install the new brace members on Bent 1.

4.10 Using the mobile crane, lift the new prefabricated Bent 2 diagonal member and bracing into position and make up connections.

4.11 Using the mobile crane, lift the new prefabricated Bent 3 diagonal member and bracing into position and make up connections.

4.12 Using the mobile crane, lift the new prefabricated Bent 4 diagonal member and bracing into position and make up connections.

4.13 Using the mobile crane, lift the new prefabricated Bent 5 diagonal member and bracing into position and make up connections.

4.14 Remove the existing brace members on Bent 2.

4.15 Install the new brace members on Bent 2.

4.16 Remove the existing brace members on Bent 3.

4.17 Install the new brace members on Bent 3.

4.18 Move the cask crane to the north end of the support structure.

4.19 Remove the existing brace members on Bent 4.

4.20 Install the new brace members on Bent 4.

4.21 Remove the existing brace members on Bent 5.

4.22 Install the new brace members on Bent 5.

4.23 Remove the existing brace members on Bent 6.

4.24 Install the new brace members on Bent 6.

4.25 Move the cask crane to the south end of the support structure.

4.26 Remove the existing diagonal vertical brace members between Bent 1 and Bent 2. (NOTE: The vertical diagonal brace members between Bents 5 and 6 must be in place at all times when the vertical diagonal brace members between Bents 1 and 2 are removed and replaced.)

4.27 Remove the existing horizontal and vertical stability truss members between Bent 1 and Bent 2 at elevations 54'-0" and 59'-0".

4.28 Install new vertical diagonal brace members between Bent 1 and Bent 2.

4.29 Install new stability trusses between Bent 1 and Bent 2 at elevations 54'-0" and 59'-0".

4.30 Move the cask crane to the north end of the support structure.

4.31 Remove the existing diagonal vertical brace members between Bent 5 and Bent 6. (NOTE: The vertical diagonal brace members between Bents 1 and 2 must be in place at all times when the vertical diagonal brace members between Bents 5 and 6 are removed and replaced.)

4.32 Remove the existing horizontal and vertical stability truss members between Bent 5 and Bent 6 at elevations 54'-0" and 59'-0".

4.33 Install new vertical diagonal brace members between Bent 5 and Bent 6.

4.34 Install new stability trusses between Bent 5 and Bent 6 at elevations 54'-0" and 59'-0".

4.35 Move the cask crane to the south end of the support structure.

4.36 Remove the existing horizontal and vertical trusses at elevation 94'-6" between Bent 1 and Bent 2.

4.37 Install the new horizontal and vertical trusses at elevation 94'-6" between Bent 1 and Bent 2.

4.38 Move the cask crane to the north end of the support structure.

4.39 Remove the existing horizontal and vertical stability truss members between Bent 3 and Bent 4 at elevations 54'-0" and 59'-0".

4.40 Install new horizontal and vertical truss members between Bent 3 and Bent 4 at elevations 54'-0" and 59'-0".

4.41 Remove the existing horizontal and vertical stability truss members between Bent 2 and Bent 3 at elevations 54'-0" and 59'-0".

4.42 Install new horizontal and vertical truss members between Bent 2 and Bent 3 at elevations 54'-0" and 59'-0".

4.43 Remove the existing horizontal and vertical stability truss members between Bent 4 and Bent 5 at elevations 54'-0" and 59'-0".

4.44 Install new horizontal and vertical truss members between Bent 4 and Bent 5 at elevations 54'-0" and 59'-0".

4.45 Remove the truss at elevation 94'-6" between Bent 3 and Bent 4.

4.46 Install the new truss at elevation 94'-6" between Bent 3 and Bent 4.

4.47 Remove the truss at elevation 94'-6" between Bent 2 and Bent 3.

4.48 Install the new truss at elevation 94'-6" between Bent 2 and Bent 3.

4.49 Remove the truss at elevation 94'-6" between Bent 4 and Bent 5.

4.50 Install the new truss at elevation 94'-6" between Bent 4 and Bent 5.

4.51 Remove the truss at elevation 94'-6" between Bent 5 and Bent 6.

4.52 Install the new truss at elevation 94'-6" between Bent 5 and Bent 6.

5.0 PHASE IV - WEST SIDE RUNWAY

5.1 Install the new column cover plates on Bent 1.1. **(INDEPENDENT ACTIVITY)**

5.2 Install the new column cover plates on Bent 1.9. **(INDEPENDENT ACTIVITY)**

5.3 Install the new column cover plates on Bent 2.7. **(INDEPENDENT ACTIVITY)**

5.4 Install the new column cover plates on Bent 3.6. **(INDEPENDENT ACTIVITY)**

5.5 Install the new column cover plates on Bent 4.4. **(INDEPENDENT ACTIVITY)**

5.6 Install the new column cover plates on Bent 5.2. **(INDEPENDENT ACTIVITY)**

5.7 Install the new column cover plates on Bent 6.1. **(INDEPENDENT ACTIVITY)**

5.8 Lift the new prefabricated Bent 2.7 diagonal member and bracing into position and make up connections. **(INDEPENDENT ACTIVITY)**

5.9 Lift the new prefabricated Bent 3.6 diagonal member and bracing into position and make up connections. **(INDEPENDENT ACTIVITY)**

5.10 Lift the new prefabricated Bent 4.4 diagonal member and bracing into position and make up connections. **(INDEPENDENT ACTIVITY)**

5.11 Remove the existing brace members on Bent 2.7.

5.12 Install the new brace members on Bent 2.7.

5.13 Remove the existing brace members on Bent 3.6.

5.14 Install the new brace members on Bent 3.6.

5.15 Remove the existing brace members on Bent 4.4.

5.16 Install the new brace members on Bent 4.4.

5.17 Move the cask crane to the South end of the support structure.

5.18 Remove the existing horizontal and vertical trusses at elevation 94'-6" between Bent 1.1 and Bent 1.9.

5.19 Install the new horizontal and vertical trusses at elevation 94'-6" between Bent 1.1 and Bent 1.9.

5.20 Remove the truss at elevation 94'-6" between Bent 1.9 and Bent 2.7.

5.21 Install the new truss at elevation 94'-6" between Bent 1.9 and Bent 2.7.

5.22 Remove the truss at elevation 94'-6" between Bent 2.7 and Bent 3.6.

5.23 Install the new truss at elevation 94'-6" between Bent 2.7 and Bent 3.6.

5.24 Move the cask crane to the North end of the support structure.

5.25 Remove the truss at elevation 94'-6" between Bent 3.6 and Bent 4.4.

5.26 Install the new truss at elevation 94'-6" between Bent 3.6 and Bent 4.4.

5.27 Remove the truss at elevation 94'-6" between Bent 4.4 and Bent 5.2.

5.28 Install the new truss at elevation 94'-6" between Bent 4.4 and Bent 5.2.

5.29 Remove the truss at elevation 94'-6" between Bent 5.2 and Bent 6.1.

5.30 Install the new truss at elevation 94'-6" between Bent 5.2 and Bent 6.1.

6.0 PHASE V - SPENT FUEL BUILDING ROOF TRUSSES AND CRANE RAIL REPLACEMENT

6.1 With the cask crane located at the North end of the support structure, install the Unit 4 Spent Fuel Building roof truss members between Bents 5.2 and 6.1.

6.2 Move the cask crane to the South end of the support structure.

6.3 Install the Unit 3 Spent Fuel Building roof truss members between Bents 1.1 and 1.9.

6.4 Begin removal and replacement of the existing crane rails on both runways moving from North to South.

NOTE: The new crane rail section is approximately one inch higher than the existing crane rail. For that reason it will be necessary to transition the removal/replacement of the rails so that the existing crane can move from the existing rails up onto the new rails in preparation for removal. This will require interface with ACECO to determine the proper method, length and slope for the transition sections.

6.5 After the existing cask crane is cleared from the remaining section of the existing rails, proceed to remove and replace the remaining sections of the existing crane rails.

7.0 PHASE VI - EXISTING CASK CRANE REMOVAL

7.1 BY ACECO. (Ref. PC/M 07-048).

8.0 PHASE VII - NEW CASK CRANE INSTALLATION

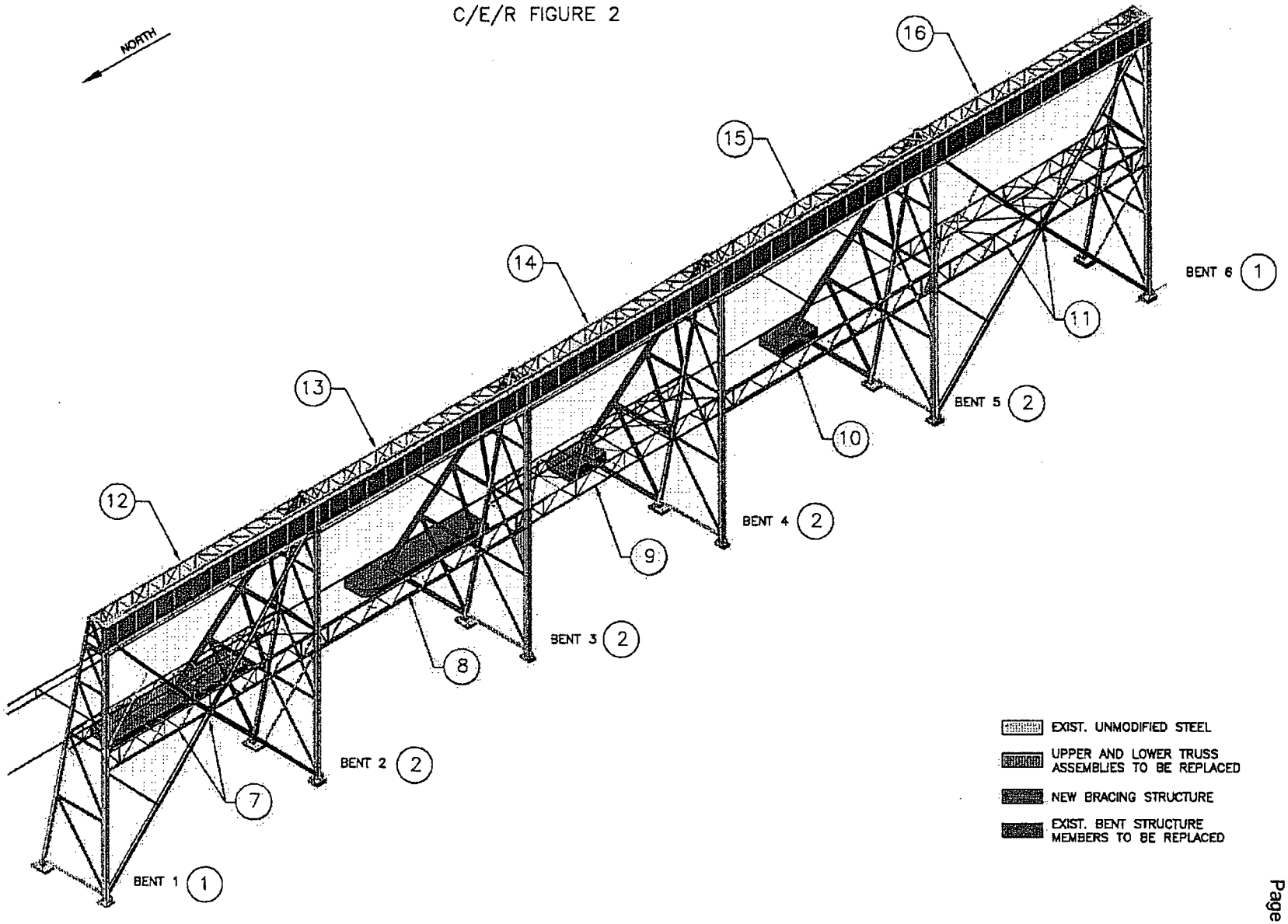
8.1 BY ACECO. (Ref. PC/M 07-049).

ATTACHMENT 2

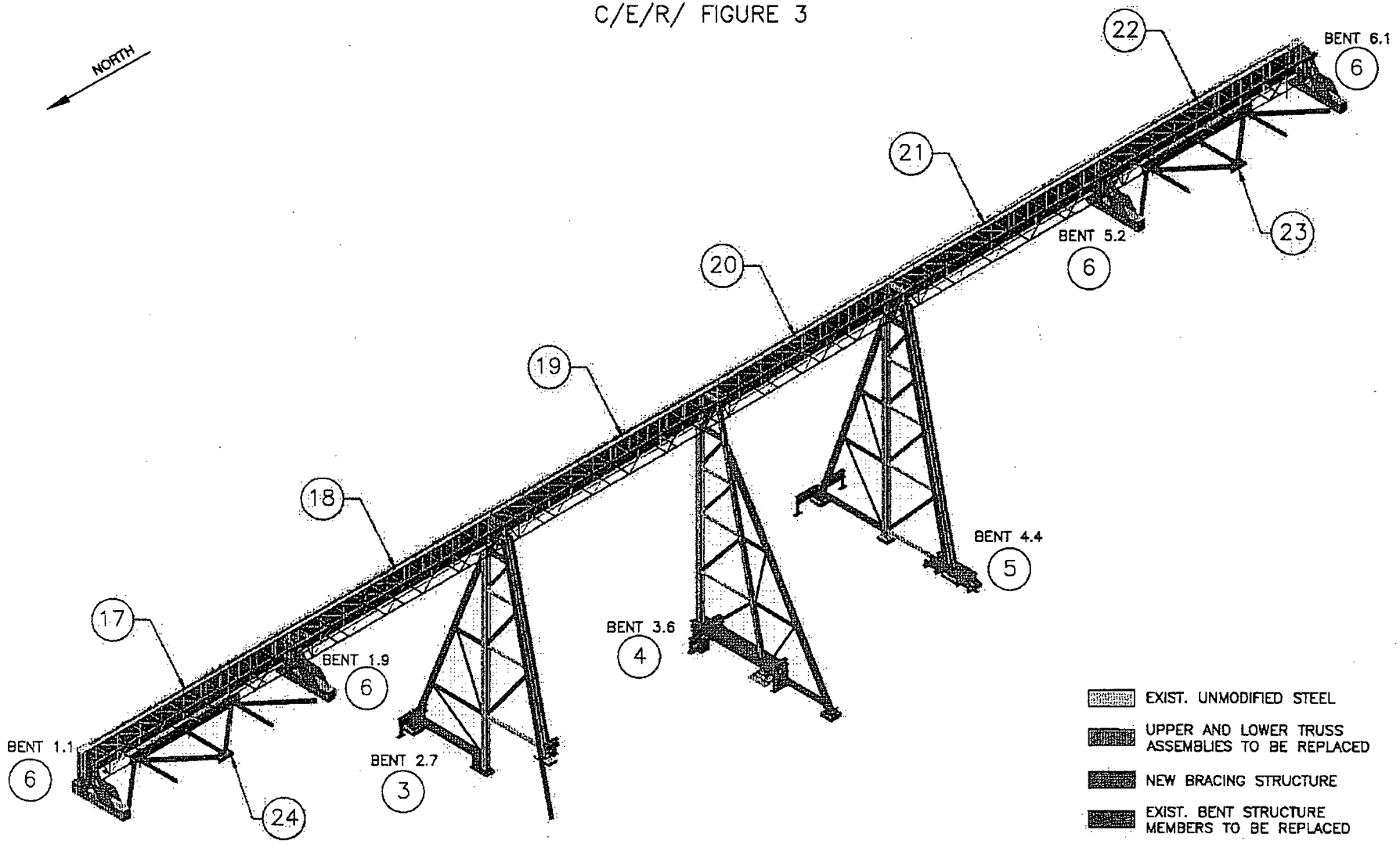
WEIGHTS OF NEW STEEL MEMBERS AND ASSEMBLIES

NOTE: All location reference numbers in Weight Tables are to be referred to Figures 2 and 3 included in this attachment.

C/E/R FIGURE 2


NORTH
16
15
14
13
12
11
10
9
8
7
BENT 6 1
BENT 5 2
BENT 4 2
BENT 3 2
BENT 2 2
BENT 1 1
EXIST. UNMODIFIED STEEL
UPPER AND LOWER TRUSS ASSEMBLIES TO BE REPLACED
NEW BRACING STRUCTURE
EXIST. BENT STRUCTURE MEMBERS TO BE REPLACED

C/E/R/ FIGURE 3


NORTH
22
BENT 6.1
6
21
23
BENT 5.2
6
20
19
18
BENT 4.4
5
17
BENT 3.6
4
BENT 1.9
6
BENT 1.1
6
BENT 2.7
3
24
EXIST. UNMODIFIED STEEL
UPPER AND LOWER TRUSS ASSEMBLIES TO BE REPLACED
NEW BRACING STRUCTURE
EXIST. BENT STRUCTURE MEMBERS TO BE REPLACED

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	1

Bents 1 & 6

New Members added to Existing Frame Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 40	Length @ EL. 40'-0"	40	1	15.58	623
	Length @ EL. 53'-3 3/4"	40	1	3.83	153
	Length @ EL. 59'-0"	40	1	11.50	460
	Length btwn. EL 59'-0" and 74'-9"	40	1	16.58	663
	Length @ EL. 74'-9"	40	1	8.58	343
	Length btwn. EL 74'-9" and 84'-1 3/4"	40	1	10.00	400
	Length @ EL. 84'-1 3/4"	40	1	6.42	257
W 10 x 49	Length btwn. EL 20'-0" and 40'-0"	49	1	23.67	1160
	Length btwn. EL 40'-0" and 59'-0"	49	1	20.83	1021
W 10 x 88	Length btwn. EL 86'-8 1/2" and 94'-6"	88	1	9.83	865
WT 6 x 29	Length btwn. EL 84'-1 3/4" and 86'-8 1/2"	29	1	5.33	155
L 5x3x3/8	Length @ 86'-8 1/2"	9.8	2	6.75	132
1-1/4" x 9" Cover Plate	Lengths Along Diagonal Member	38.3	2	76.08	5828
	Lengths Along Horizontal Member @ 94'	38.3	2	3.58	274
3/4" x 16-1/2"Cover Plate	Lengths Along Vertical Column Member	41.1	2	67.74	5569
1/2" x 7"Cover Plate	Lengths Along Lowest Horizontal Member	41.1	2	18.17	1494
				Subtotal (lb.)	19398
			(Assume 10% Increase)	Gusset Plates (lb.)	1940
				Number of Bents	2
				TOTAL STEEL WEIGHT (lb.)	42675
				TOTAL MEMBERS	42

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	2

Bent 2 thru 5

New Members added to Existing Frame Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 40	Length @ EL. 40'-0"	40	1	15.58	623
	Length @ EL. 53'-3 3/4"	40	1	3.83	153
	Length @ EL. 59'-0"	40	1	11.50	460
	Length btwn. EL 59'-0" and 74'-9"	40	1	16.58	663
	Length @ EL. 74'-9"	40	1	8.58	343
	Length btwn. EL 74'-9" and 84'-1 3/4"	40	1	10.00	400
	Length @ EL. 84'-1 3/4"	40	1	6.42	257
W 10 x 49	Length btwn. EL 20'-0" and 40'-0"	49	1	23.67	1160
	Length btwn. EL 40'-0" and 59'-0"	49	1	20.83	1021
W 10 x 88	Length btwn. EL 86'-8 1/2" and 94'-6"	88	1	9.83	865
WT 6 x 29	Length btwn. EL 84'-1 3/4" and 86'-8 1/2"	29	1	5.33	155
L 5x3x3/8	Length @ 86'-8 1/2"	9.8	2	6.75	132
1-1/4" x 9" Cover Plate	Lengths Along Diagonal Member	38.3	2	37.58	2879
	Lengths Along Horizontal Member @ 84'	38.3	2	3.58	274
3/4" x 18-1/2"Cover Plate	Lengths Along Vertical Column Member	41.1	2	23.42	1925
1/2" x 7"Cover Plate	Lengths Along Lowest Horizontal Member	41.1	2	18.17	1494
				Subtotal (lb.)	12805
	(Assume 10% Increase)			Gusset Plates (lb.)	1280
				Number of Bents	4
				TOTAL STEEL WEIGHT (lb.)	56341
				TOTAL MEMBERS	84

New Members For Kicker Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 40	Length @ EL. 40'-0"	40	1	18.25	730
	Length btwn. EL 40'-0" and 59'-0"	40	1	19.25	770
	Length @ EL. 59'-0"	40	1	11.67	467
	Length btwn. EL 59'-0" and 74'-9"	40	1	14.33	573
	Length @ EL. 74'-9"	40	1	6.25	250
	Length @ EL. 84'-1 3/4"	40	1	2.92	117
W 10 x 49	Length @ EL. 20'-0"	49	1	25.75	1262
	Length btwn. EL 20'-0" and 40'-0"	49	1	23.00	1127
W 14 x 109	Length btwn. EL 59'-0" and 94'-6"	109	1	41.92	4569
W 14 x 159	Length btwn. EL 20'-0" and 59'-0"	159	1	42.08	6691
				Subtotal (lb.)	16556
	(Assume 10% Increase)			Gusset Plates (lb.)	1656
				Number of Bents	4
				TOTAL STEEL WEIGHT (lb.)	72845
				TOTAL MEMBERS	40

TOTAL STEEL WEIGHT (lb.)	129185

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	3

Bent 2.7

New Members added to Existing Frame Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
WT 6 x 32.5	Length btwn. EL 36'-9" and 94'-6"	32.5	2	44.79	2911
W 8 x 25	Length btwn. EL 76'-9" and 84'-1 3/4"	25	1	6.50	213
WT 8 x 33.5	Length btwn. EL 47'-6" and 63'-9"	33.5	1	18.67	625
	Length btwn. EL 63'-9" and 76'-9"	33.5	1	14.25	477
W 8 x 40	Length @ 84'-1 3/4"	40	1	7.04	282
WT 6 x 29	Length btwn. EL 84'-1 3/4" and 86'-8 3/4"	29	1	4.96	144
L 5x3x3/8	Lengths @ 86'-8 3/4"	9.8	2	6.42	126
W 10 x 88	Length btwn. EL 86'-8 3/4" and 94'-6"	88	1	10.17	895
				Subtotal (lb.)	5673
			(Assume 10% Increase)	Gusset Plates (lb.)	567
				TOTAL STEEL WEIGHT (lb.)	6240
				TOTAL MEMBERS	10

New Members For Kicker Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
WT 8 x 25	Length btwn. EL 36'-9" and 47'-6"	25	1	15.42	385
	Length @ EL. 47'-6"	25	1	14.17	354
	Length btwn. EL 47'-6" and 63'-9"	25	1	16.67	417
	Length @ EL. 63'-9"	25	1	7.71	193
W 12 x 120	Length btwn. EL 34'-0" and 84'-1 3/4"	120	1	51.67	6200
W 18 x 130	Length @ EL. 36'-9"	130	1	20.22	2628
				Subtotal (lb.)	10177
			(Assume 10% Increase)	Gusset Plates (lb.)	1018
				TOTAL STEEL WEIGHT (lb.)	11195
				TOTAL MEMBERS	5

TOTAL STEEL WEIGHT (lb.)	17435

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	4

Bent 3.6

New Members added to Existing Frame Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 25	Length btwn. EL 76'-9" and 84'-1 3/4"	25	1	8.50	213
WT 8 x 33.5	Length btwn. EL 47'-6" and 63'-9"	33.5	1	18.67	625
	Length btwn. EL 63'-9" and 76'-9"	33.5	1	14.25	477
W 8 x 40	Length @ 84'-1 3/4"	40	1	7.04	282
WT 6 x 29	Length btwn. EL 84'-1 3/4" and 86'-8 3/4"	29	1	4.96	144
L 5x3x3/8	Lengths @ 86'-8 3/4"	9.8	2	6.42	126
W 10 x 88	Length btwn. EL 86'-8 3/4" and 94'-6"	88	1	10.17	895
W 18 x 76	Length btwn. EL 36'-9" and 94'-6"	76	2	18.96	2882
				Subtotal (lb.)	5643
			(Assume 10% Increase)	Gusset Plates (lb.)	564
				TOTAL STEEL WEIGHT (lb.)	6207
				TOTAL MEMBERS	8

New Members For Kicker Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
WT 8 x 25	Length btwn. EL 36'-9" and 47'-6"	25	1	13.75	344
	Length @ EL. 47'-6"	25	1	8.81	220
	Length btwn. EL 47'-6" and 63'-9"	25	1	11.79	295
	Length @ EL. 63'-9"	25	1	4.83	121
W 8 x 40	Length @ 38'-6"	40	1	12.92	517
W 12 x 120	Length btwn. EL 34'-0" and 84'-1 3/4"	120	1	51.67	6200
				Subtotal (lb.)	7696
			(Assume 10% Increase)	Gusset Plates (lb.)	770
				TOTAL STEEL WEIGHT (lb.)	8466
				TOTAL MEMBERS	6

TOTAL STEEL WEIGHT (lb.)	14673

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	5

Bent 4.4

New Members added to Existing Frame Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
WT 6 x 32.5	Length btwn. EL 36'-9" and 94'-6"	32.5	2	55.99	3640
W 8 x 25	Length btwn. EL 76'-9" and 84'-1 3/4"	25	1	8.50	213
WT 8 x 33.5	Length btwn. EL 36'-9" and 51'-9"	33.5	1	18.67	625
WT 8 x 50	4 Lengths @ 35'-0"	50	4	12.67	2533
W 8 x 40	Length @ 84'-1 3/4"	40	1	7.04	282
WT 6 x 29	Length btwn. EL 84'-1 3/4" and 86'-8 3/4"	29	1	4.96	144
L 5x3x3/8	Lengths @ 86'-8 3/4"	9.8	2	6.42	126
W 10 x 88	Length btwn. EL 86'-8 3/4" and 94'-6"	88	1	10.17	895
W 12 x 120	4 Lengths @ 35'-9"	120	4	18.00	8640
	2 Lengths @ 36'-6"	120	2	21.00	5040
				Subtotal (lb.)	8457
			(Assume 10% Increase)	Gusset Plates (lb.)	846
				TOTAL STEEL WEIGHT (lb.)	9302
				TOTAL MEMBERS	13

New Members For Kicker Design

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
WT 8 x 25	Length btwn. EL 36'-9" and 47'-6"	25	1	17.73	443
	Length @ EL. 47'-6"	25	1	10.92	273
	Length btwn. EL 47'-6" and 63'-9"	25	1	13.17	329
	Length @ EL. 63'-9"	25	1	6.25	156
W 8 x 40	Length @ 36'-9"	40	1	16.73	669
W 12 x 120	Length btwn. EL 34'-0" and 84'-1 3/4"	120	1	50.67	6080
				Subtotal (lb.)	7951
			(Assume 10% Increase)	Gusset Plates (lb.)	795
				TOTAL STEEL WEIGHT (lb.)	8746
				TOTAL MEMBERS	6

TOTAL STEEL WEIGHT	18048

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	6

Bents 1.1, 1.9, 5.2, 6.1					
Replacement and New Members added to Existing Frame Design					
Member	Description	Plate Thickness (in.)	Number of Members	Area (in^2)	Total Weight (lb.)
Plate on Vertical Column Connection	Plate Attaching Vertical Column to SFPB Roof Wall	1	2	1560	885
Plate on Diagonal Column Connection	Plate Attaching Diagonal Column to SFPB Roof Wall	1	2	2140	1214
1" x 7" Cover Plate	Length Along Diagonal Member	1	2	686	389
1" x 7" Cover Plate	Length Along Vertical Member	1	2	630	357
1" x 7" Cover Plate	Length Along Vertical Member	1	1	420	119
				Subtotal (lb.)	2964
			(Assume 10% Increase)	Gusset Plates (lb.)	296
				Number of Bents	4
				TOTAL STEEL WEIGHT (lb.)	13041
				TOTAL MEMBERS	24

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	7

Truss at EL.54'-0" to 59'-0" Between Bents 1 & 2		
Span Length	67.5	ft.
Truss Depth	5.0	ft.
Truss Width	11.9	ft.
Distance to New Kicker	12.3	ft.
Horizontal End Spacing	29.0	ft.
Horizontal Center Spacing	9.5	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 40	Members on Western Face at EL. 59'-0" between Bents 1&2 and X-Bracing	40	2	29.00	2320
	Member on Western Face at EL. 59'-0" between X-Bracing	40	1	9.50	380
	Members on Western Face at EL. 54'-0" between Bents 1&2 and X-Bracing	40	2	33.75	2700
	Member on Eastern Face at EL. 59'-0"	40	1	67.50	2700
	Member on Eastern Face at EL. 54'-0"	40	1	67.50	2700
WT 6 x 36	Horizontal Truss End Digonal Members at EL. 59'-0"	36	4	18.79	2706
	Horizontal Truss End Digonal Members at EL. 54'-0"	36	4	18.79	2706
	Horizontal Truss Center Digonal Members at EL. 59'-0"	36	4	7.53	1099
	Horizontal Truss Center Digonal Members at EL. 54'-0"	36	4	7.53	1099
	Horizontal Truss Vertical Members at EL. 59'-0"	36	4	11.95	1721
	Horizontal Truss Vertical Members at EL. 54'-0"	36	4	11.95	1721
	Horizontal Truss Center Horizontal Member at EL. 59'-0"	36	1	9.50	342
	Horizontal Truss Center Horizontal Member at EL. 54'-0"	36	1	9.50	342
	Horizontal Member Connected W 8x40 to New Kicker at 59'-0"	36	1	19.00	684
WT 5 x 16.5	Vertical Truss End Diagonal Members Western Face	16.5	12	6.95	1377
	Vertical Truss Vertical Members Western Face	16.5	5	5.00	413
	Vertical Truss End Diagonal Members Eastern Face	16.5	12	6.95	1377
	Vertical Truss Center Diagonal Members Eastern Face	16.5	2	6.90	228
	Vertical Truss Vertical Members Eastern Face	16.5	5	5.00	413
				Subtotal (lb.)	27025
			(Assume 10% Increase)	Gusset Plates (lb.)	2702
				TOTAL STEEL WEIGHT (lb.)	29727
				TOTAL MEMBERS	73
W 12 x 96	Single X-Bracing Member Running from Bent 2 to Bent 1	96	1	94.90	9110
	X-Bracing Members Running from Bent 2 to Bottom of Truss	96	1	48.98	4702
	X-Bracing Members Running from Bottom of Truss to Bent 1	96	1	45.92	4408
				Subtotal (lb.)	18220
			(Assume 20% Increase)	Gusset Plates (lb.)	3644
				TOTAL STEEL WEIGHT (lb.)	21864
				TOTAL MEMBERS	58

Note: This bay includes X-Bracing in the North/South Direction that must be incorporated into the construction of the Western Face Vertical Truss. Weights for this X-Bracing are given, but not included in Total Truss Weight.

TOTAL STEEL WEIGHT	51591

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	8

Truss at EL.54'-0" to 59'-0" Between Bents 2 & 3		
Span Length	67.5	ft.
Truss Depth	5.0	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 40	Member on Western Face at EL. 59'-0"	40	1	67.50	2700
	Member on Western Face at EL. 54'-0"	40	1	67.50	2700
WT 5 x 16.5	Vertical Truss Diagonal Members Western Face	16.5	14	6.95	1605
	Vertical Truss Vertical Members Western Face	16.5	5	5.00	413
				Subtotal (lb.)	7417
			(Assume 10% increase)	Gusset Plates (lb.)	742
				TOTAL STEEL WEIGHT (lb.)	8159
				TOTAL MEMBERS	21

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	9

Truss at EL.54'-0" to 59'-0" Between Bents 3 & 4		
Span Length	62.0	ft.
Truss Depth	5.0	ft.
Truss Width	11.9	ft.
Distance to New Kicker	12.3	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 40	Member on Western Face at EL. 59'-0"	40	1	62.00	2480
	Member on Western Face at EL. 54'-0"	40	1	62.00	2480
	Member on Eastern Face at EL. 59'-0"	40	1	62.00	2480
	Member on Eastern Face at EL. 54'-0"	40	1	62.00	2480
WT 6 x 36	Horizontal Truss Digonal Members at EL. 59'-0"	36	4	19.57	2818
	Horizontal Truss Digonal Members at EL. 54'-0"	36	4	19.57	2818
	Horizontal Truss Vertical Members at EL. 59'-0"	36	4	11.95	1721
	Horizontal Truss Vertical Members at EL. 54'-0"	36	4	11.95	1721
	Horizontal Members Connected W 8x40 to New Kicker at 59'-0"	36	2	19.78	1424
WT 5 x 16.5	Vertical Truss Diagonal Members Western Face	16.5	12	7.19	1424
	Vertical Truss Vertical Members Western Face	16.5	3	5.00	248
	Vertical Truss Diagonal Members Eastern Face	16.5	12	7.19	1424
	Vertical Truss Vertical Members Eastern Face	16.5	3	5.00	248
				Subtotal (lb.)	16803
			(Assume 10% Increase)	Gusset Plates (lb.)	1680
				TOTAL STEEL WEIGHT (lb.)	20684
				TOTAL MEMBERS	52

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	10

Truss at EL.54'-0" to 59'-0" Between Bents 4 & 5		
Span Length	68.0	ft.
Truss Depth	5.0	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 40	Member on Western Face at EL. 59'-0"	40	1	68.00	2720
	Member on Western Face at EL. 54'-0"	40	1	68.00	2720
WT 5 x 16.5	Vertical Truss Diagonal Members Western Face	16.5	14	6.97	1610
	Vertical Truss Vertical Members Western Face	16.5	5	5.00	413
				Subtotal (lb.)	7463
			(Assume 10% Increase)	Gusset Plates (lb.)	746
				TOTAL STEEL WEIGHT (lb.)	8209
				TOTAL MEMBERS	21

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	11

Truss at EL.54'-0" to 59'-0" Between Bents 5 & 6

Span Length	68.0	ft.
Truss Depth	5.0	ft.
Truss Width	11.9	ft.
Distance to New Kicker	12.3	ft.
Horizontal End Spacing	29.0	ft.
Horizontal Center Spacing	9.6	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 8 x 40	Members on Western Face at EL. 59'-0" between Bents 5&6 and X-Bracing	40	2	29.21	2337
	Member on Western Face at EL. 59'-0" between X-Bracing	40	1	9.58	383
	Members on Western Face at EL. 54'-0" between Bents 5&6 and X-Bracing	40	2	34.00	2720
	Member on Eastern Face at EL. 59'-0"	40	1	68.00	2720
	Member on Eastern Face at EL. 54'-0"	40	1	68.00	2720
WT 6 x 36	Horizontal Truss End Digonal Members at EL. 59'-0"	36	4	18.79	2706
	Horizontal Truss End Digonal Members at EL. 54'-0"	36	4	18.79	2706
	Horizontal Truss Center Digonal Members at EL. 59'-0"	36	4	7.66	1103
	Horizontal Truss Center Digonal Members at EL. 54'-0"	36	4	7.66	1103
	Horizontal Truss Vertical Members at EL. 59'-0"	36	4	11.95	1721
	Horizontal Truss Vertical Members at EL. 54'-0"	36	4	11.95	1721
	Horizontal Truss Center Horizontal Member at EL. 59'-0"	36	1	9.58	345
	Horizontal Truss Center Horizontal Member at EL. 54'-0"	36	1	9.58	345
	Horizontal Member Connected W 8x40 to New Kicker at 59'-0"	36	1	19.00	684
WT 5 x 16.5	Vertical Truss End Diagonal Members Western Face	16.5	12	6.95	1377
	Vertical Truss Vertical Members Western Face	16.5	5	5.00	413
	Vertical Truss End Diagonal Members Eastern Face	16.5	12	6.95	1377
	Vertical Truss Center Diagonal Members Eastern Face	16.5	2	6.93	229
	Vertical Truss Vertical Members Eastern Face	16.5	5	5.00	413
				Subtotal (lb.)	27119
			(Assume 10% Increase)	Gusset Plates (lb.)	2712
				TOTAL STEEL WEIGHT (lb.)	29831
				TOTAL MEMBERS	73
W 12 x 96	Single X-Bracing Member Running from Bent 2 to Bent 1	96	1	95.23	9142
	X-Bracing Members Running from Bent 2 to Bottom of Truss	96	1	49.16	4719
	X-Bracing Members Running from Bottom of Truss to Bent 1	96	1	46.08	4424
				Subtotal (lb.)	18285
			(Assume 20% Increase)	Gusset Plates (lb.)	3657
				TOTAL STEEL WEIGHT (lb.)	21941
				TOTAL MEMBERS	58

Note: This bay includes X-Bracing in the North/South Direction that must be incorporated into the construction of the Western Face Vertical Truss. Weights for this X-Bracing are given, but not included in Total Truss Weight.

TOTAL STEEL WEIGHT	51772

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	12

Truss at EL.94'-6" Between Bents 1 & 2		
Span Length	67.5	ft.
Truss Depth	7.1	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	67.5	4590
W 8 x 31	Bottom Chord of Truss	31	1	67.5	2093
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.68	1562
	End Diagonals of Vertical Web of Truss	15	2	8.02	241
	Verticals of Vertical Web of Truss	15	3	7.09	319
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	6.18	359
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	6.18	359
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	18110
			(Assume 10% Increase)	Gusset Plates (lb.)	1811
				TOTAL STEEL WEIGHT (lb.)	19921
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	13

Truss at EL 94'-6" Between Bents 2 & 3		
Span Length	67.5	ft.
Truss Depth	7.1	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	67.5	4590
W 8 x 31	Bottom Chord of Truss	31	1	67.5	2093
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.68	1562
	End Diagonals of Vertical Web of Truss	15	2	8.02	241
	Verticals of Vertical Web of Truss	15	3	7.09	319
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	6.18	359
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	6.18	359
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	18110
			(Assume 10% Increase)	Gusset Plates (lb.)	1811
				TOTAL STEEL WEIGHT (lb.)	19921
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	14

Truss at EL.94'-6" Between Bents 3 & 4		
Span Length	62.0	ft.
Truss Depth	7.1	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	62.0	4216
W 8 x 31	Bottom Chord of Truss	31	1	62.0	1922
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.68	1562
	End Diagonals of Vertical Web of Truss	15	2	7.16	215
	Verticals of Vertical Web of Truss	15	3	7.09	319
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	5.02	291
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	5.02	291
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	17404
			(Assume 10% Increase)	Gusset Plates (lb.)	1740
				TOTAL STEEL WEIGHT (lb.)	19145
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	15

Truss at EL.94'-6" Between Bents 4 & 5		
Span Length	68.0	ft.
Truss Depth	7.1	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	68.0	4624
W 8 x 31	Bottom Chord of Truss	31	1	68.0	2108
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.68	1562
	End Diagonals of Vertical Web of Truss	15	2	8.14	244
	Verticals of Vertical Web of Truss	15	3	7.09	319
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	6.34	368
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	6.34	368
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	18181
			(Assume 10% Increase)	Gusset Plates (lb.)	1818
				TOTAL STEEL WEIGHT (lb.)	19999
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	16

Truss at EL.94'-6" Between Bents 5 & 6		
Span Length	68.0	ft.
Truss Depth	7.1	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	68.0	4624
W 8 x 31	Bottom Chord of Truss	31	1	68.0	2108
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.68	1562
	End Diagonals of Vertical Web of Truss	15	2	8.14	244
	Verticals of Vertical Web of Truss	15	3	7.09	319
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	6.34	368
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	6.34	368
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	18181
			(Assume 10% Increase)	Gusset Plates (lb.)	1818
				TOTAL STEEL WEIGHT (lb.)	19999
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	17

Truss at EL.94'-6" Between Bents 1.1 & 1.9		
Span Length	55.6	ft.
Truss Depth	7.2	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	55.6	3780
W 8 x 31	Bottom Chord of Truss	31	1	55.6	1723
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.73	1571
	End Diagonals of Vertical Web of Truss	15	2	7.49	225
	Verticals of Vertical Web of Truss	15	3	7.16	322
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	5.39	313
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	5.39	313
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	16834
	(Assume 10% Increase)			Gusset Plates (lb.)	1683
				TOTAL STEEL WEIGHT (lb.)	18517
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	18

Truss at EL.94'-6" Between Bents 1.9 & 2.7		
Span Length	54.3	ft.
Truss Depth	7.2	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	54.3	3689
W 8 x 31	Bottom Chord of Truss	31	1	54.3	1682
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.73	1571
	End Diagonals of Vertical Web of Truss	15	2	7.71	231
	Verticals of Vertical Web of Truss	15	3	7.16	322
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	5.70	330
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	5.70	330
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	16744
			(Assume 10% Increase)	Gusset Plates (lb.)	1674
				TOTAL STEEL WEIGHT (lb.)	18418
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	19

Truss at EL.94'-6" Between Bents 2.7 & 3.6		
Span Length	57.8	ft.
Truss Depth	7.2	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	57.8	3927
W 8 x 31	Bottom Chord of Truss	31	1	57.8	1790
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.73	1571
	End Diagonals of Vertical Web of Truss	15	2	7.24	217
	Verticals of Vertical Web of Truss	15	3	7.16	322
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	5.04	293
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	5.04	293
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	17001
			(Assume 10% Increase)	Gusset Plates (lb.)	1700
				TOTAL STEEL WEIGHT (lb.)	18701
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	20

Truss at EL.94'-6" Between Bents 3.6 & 4.4

Span Length	50.8	ft.
Truss Depth	7.2	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	50.8	3451
W 8 x 31	Bottom Chord of Truss	31	1	50.8	1573
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.73	1571
	End Diagonals of Vertical Web of Truss	15	2	8.52	256
	Verticals of Vertical Web of Truss	15	3	7.16	322
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	6.75	392
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	6.75	392
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	16544
			(Assume 10% increase)	Gusset Plates (lb.)	1654
				TOTAL STEEL WEIGHT (lb.)	18199
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	21

Truss at EL 94'-6" Between Bents 4.4 & 5.2		
Span Length	56.5	ft.
Truss Depth	7.2	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	56.5	3842
W 8 x 31	Bottom Chord of Truss	31	1	56.5	1752
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.73	1571
	End Diagonals of Vertical Web of Truss	15	2	7.37	221
	Verticals of Vertical Web of Truss	15	3	7.16	322
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	5.22	303
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	5.22	303
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	16901
			(Assume 10% Increase)	Gusset Plates (lb.)	1690
				TOTAL STEEL WEIGHT (lb.)	18591
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	22

Truss at EL.94'-6" Between Bents 5.2 & 6.1		
Span Length	54.8	ft.
Truss Depth	7.2	ft.
Truss Width	4.9	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
W 10 x 68	Top Chord of Truss	68	1	54.8	3729
W 8 x 31	Bottom Chord of Truss	31	1	54.8	1700
WT 6 x 15	5'-0" Spaced Diagonals of Vertical Web of Truss	15	12	8.73	1571
	End Diagonals of Vertical Web of Truss	15	2	7.61	228
	Verticals of Vertical Web of Truss	15	3	7.16	322
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (TOP)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (TOP)	29	2	5.55	322
	Verticals of Horizontal Web of Truss (TOP)	29	13	4.92	1854
WT 6 x 29	5'-0" Spaced Diagonals of Horizontal Web of Truss (BOTTOM)	29	12	7.01	2440
	End Diagonals of Horizontal Web of Truss (BOTTOM)	29	2	5.55	322
	Verticals of Horizontal Web of Truss (BOTTOM)	29	13	4.92	1854
				Subtotal (lb.)	16782
			(Assume 10% increase)	Gusset Plates (lb.)	1678
				TOTAL STEEL WEIGHT (lb.)	18460
				TOTAL MEMBERS	73

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	23

Truss on SFPB Roof Between Bents 1.1 & 1.9

Span Length	55.6	ft.
Truss Width	11.8	ft.
Span Offset	1.0	ft.

Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
WT 6 x 33.5	Diagonal Member of Horizontal Truss	33.5	4	17.87	2395
	Horizontal Member of Horizontal Truss	33.5	2	11.83	793
W 18 x 76	Eastern Chord of Horizontal Truss	76	1	30.42	2312
1" x 15" x 9'-6" Plate	Plate Connection Truss to SFPB Roof Wall	51.0	4	9.50	1940
1" x 15" x 3'-6" Plate	Plate Connection Truss to SFPB Roof Wall	51.0	4	3.50	715
1" x 12" x 1'-3" Plate	Plate Connection Truss to SFPB Roof Wall	40.8	1	1.25	51
				Subtotal (lb.)	8205
			(Assume 10% Increase)	Gusset Plates (lb.)	1231
				TOTAL STEEL WEIGHT (lb.)	9436
				TOTAL MEMBERS	16

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Location Reference Number:	24

Truss on SFPB Roof Between Bents 5.2 & 6.1					
Span Length	54.8 ft.				
Truss Width	11.8 ft.				
Span Offset	1.0 ft.				
Member	Description	lb./ft.	Number of Members	Length (ft.)	Total Weight (lb.)
WT 8 x 33.5	Diagonal Member of Horizontal Truss	33.5	4	17.73	2376
	Horizontal Member of Horizontal Truss	33.5	2	11.83	793
W 18 x 76	Eastern Chord of Horizontal Truss	76	1	30.42	2312
1" x 15" x 9'-6" Plate	Plate Connection Truss to SFPB Roof Wall	51.0	4	9.50	1940
1" x 15" x 3'-6" Plate	Plate Connection Truss to SFPB Roof Wall	51.0	4	3.50	715
1" x 12" x 1'-3" Plate	Plate Connection Truss to SFPB Roof Wall	40.8	1	1.25	51
				Subtotal (lb.)	8186
			(Assume 10% increase)	Gusset Plates (lb.)	1228
				TOTAL STEEL WEIGHT (lb.)	9414
				TOTAL MEMBERS	16

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

Member Weights for Steel Support Structure Modification to PTN Crane

Summary Table of Steel Tonnages

Reference Number	Description	Weight (tons)
1	Bents 1 & 6	21.3
2	Bent 2 thru 5	64.6
3	Bent 2.7	8.7
4	Bent 3.6	7.3
5	Bent 4.4	9.0
6	Bents 1.1, 1.9, 5.2, 6.1	4.6
7	Truss at EL.54'-0" to 59'-0" Between Bents 1 & 2	25.6
8	Truss at EL.54'-0" to 59'-0" Between Bents 2 & 3	4.1
9	Truss at EL.54'-0" to 59'-0" Between Bents 3 & 4	10.3
10	Truss at EL.54'-0" to 59'-0" Between Bents 4 & 5	4.1
11	Truss at EL.54'-0" to 59'-0" Between Bents 5 & 6	25.9
12	Truss at EL.94'-6" Between Bents 1 & 2	10.0
13	Truss at EL.94'-6" Between Bents 2 & 3	10.0
14	Truss at EL.94'-6" Between Bents 3 & 4	9.6
15	Truss at EL.94'-6" Between Bents 4 & 5	10.0
16	Truss at EL.94'-6" Between Bents 5 & 6	10.0
17	Truss at EL.94'-6" Between Bents 1.1 & 1.9	9.3
18	Truss at EL.94'-6" Between Bents 1.9 & 2.7	9.2
19	Truss at EL.94'-6" Between Bents 2.7 & 3.6	9.1
20	Truss at EL.94'-6" Between Bents 3.6 & 4.4	9.1
21	Truss at EL.94'-6" Between Bents 4.4 & 5.2	9.3
22	Truss at EL.94'-6" Between Bents 5.2 & 6.1	9.2
23	Truss on SFPB Roof Between Bents 1.1 & 1.9	4.7
24	Truss on SFPB Roof Between Bents 5.2 & 6.1	4.7

(Assume 10% Total Increase)		
	Miscellanous/Margin Weight (tons)	30.0
	Total Tonage	329.9

* Note: All Locations Reference Numbers Refer to C/E/R Figures 2 and 3

ATTACHMENT 3

RIGGING AND LOAD HANDLING CONSIDERATIONS

DISCUSSION

An informal consultation was conducted by WGInt with Merchant Transport regarding crane selection, crane placements/boom configurations and load hook options for use in implementing the Cask Crane superstructure modifications. The context of the discussions revolved around the load handling limitations imposed by 0-ADM-717.

Based on Merchant Transport's familiarity with the TPN site along with their participation in the workshop held at TPN and the limited available locations to set up a crane, it was recommended that a Liebherr model 1150 or 1160 mobile crane would be appropriate for implementing this modification. The recommended placement locations are at North and South ends of the superstructure.

The weights shown in Attachment 2 are weights of portions of the total structure that can be prefabricated and lifted as a unit. The structure can also be subdivided into smaller sections that will meet the load handling limit given in 0-ADM-717. The smallest practical unit of the total design is an individual member.

When considering handling the individual members relative to available crane load block options, several items should be noted.

WEST SUPERSTRUCTURE RUNWAY

- When the crane is equipped with a multi-part line load block, the estimated weight of the load block can be as much as 2000 lbs. This alone equals the approved weight limit for loads over the Spent Fuel Building (SFB), thereby causing any lift over the SFB roof slabs to exceed of the approved 2000 lb weight limit when using that load block.

- When the crane is set up with a single line pull configuration using a headache ball hook, the hook weight is approximately 1000 lbs. This allows the lift of all but six of the individual members to be made without exceeding the approved 2000 lb load limit over the SFB roof slabs.

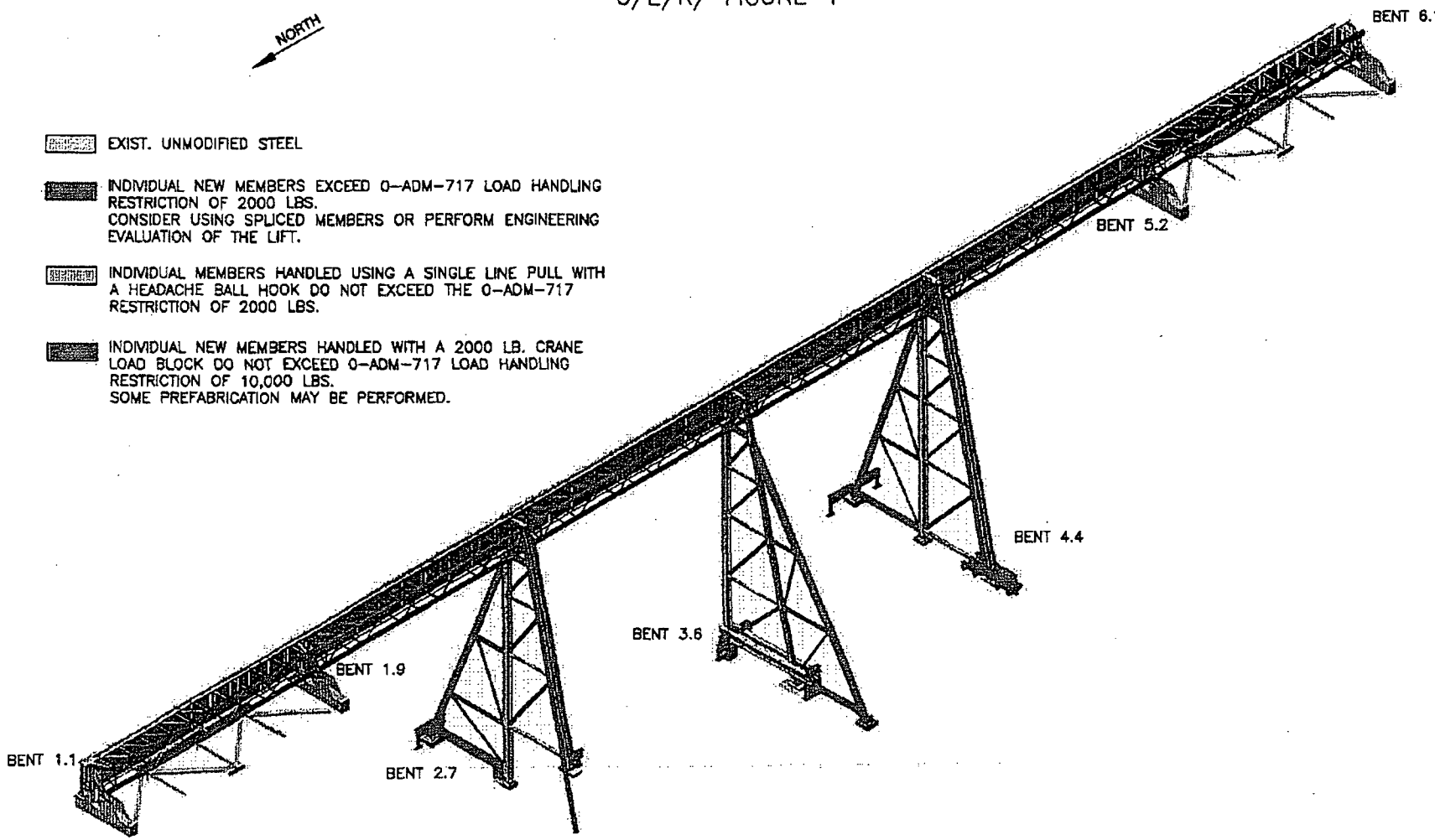
- The remaining lift locations take place over the Auxiliary Building roof slab which has an approved load limit of 5 tons. None of the individual member weights in this region exceed the 5 ton approved limit. Thus, the installer has options available for some degrees of prefabrication.

EAST SIDE SUPERSTRUCTURE RUNWAY

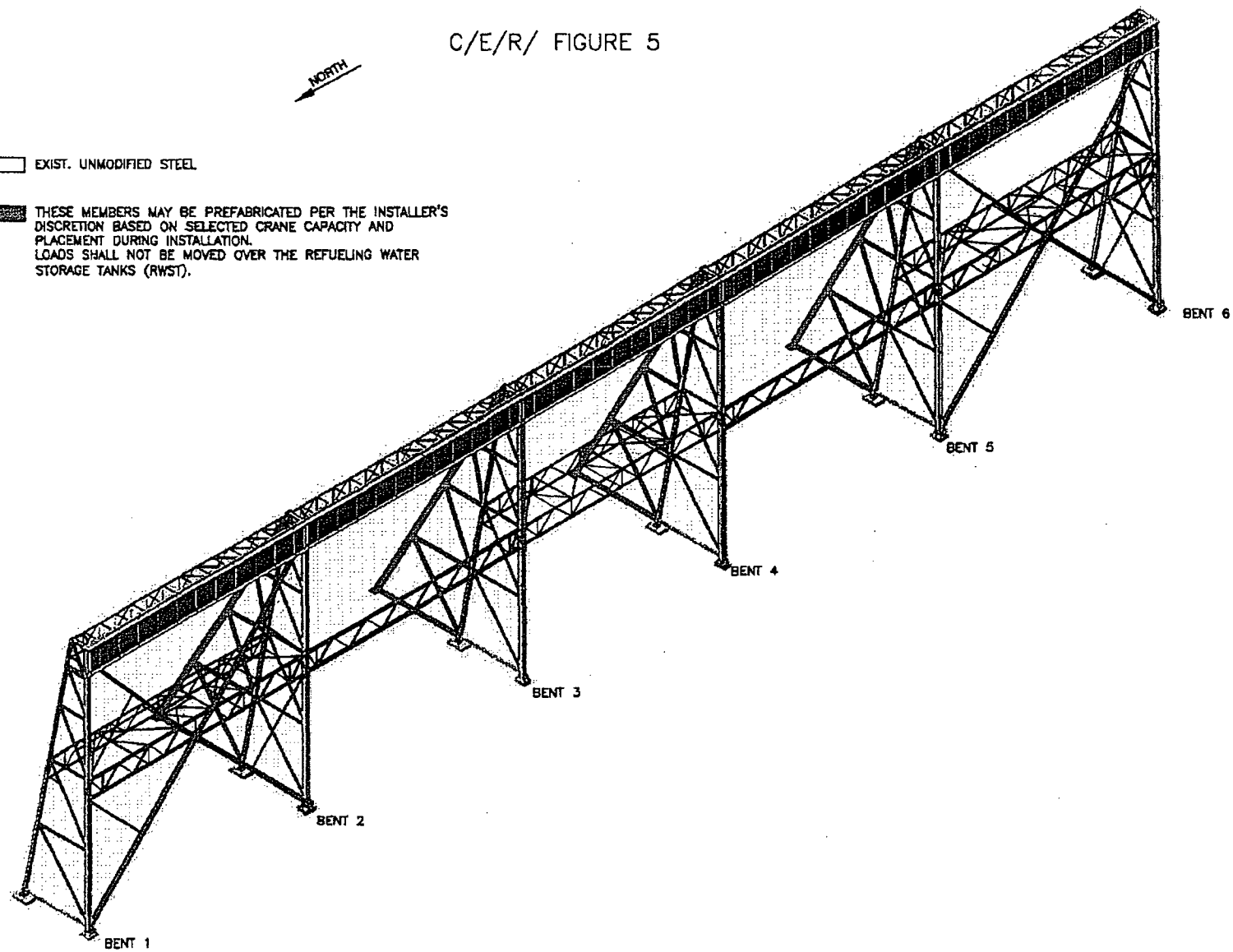
- These members do not have the same stringent load handling limitations as those on the West side runway but are in the vicinity of the restricted areas of the Reactor Water Storage Tanks and the Refuel Water Storage Tanks. This allows more opportunity for prefabrication and can also be accessed with a smaller crane located on the Haul route path.

Refer to Figures 4 and 5 for illustrations of this discussion.

C/E/R/ FIGURE 4


NORTH
EXIST. UNMODIFIED STEEL
INDIVIDUAL NEW MEMBERS EXCEED O–ADM–717 LOAD HANDLING RESTRICTION OF 2000 LBS. CONSIDER USING SPLICED MEMBERS OR PERFORM ENGINEERING EVALUATION OF THE LIFT.
INDIVIDUAL MEMBERS HANDLED USING A SINGLE LINE PULL WITH A HEADACHE BALL HOOK DO NOT EXCEED THE O–ADM–717 RESTRICTION OF 2000 LBS.
INDIVIDUAL NEW MEMBERS HANDLED WITH A 2000 LB. CRANE LOAD BLOCK DO NOT EXCEED O–ADM–717 LOAD HANDLING RESTRICTION OF 10,000 LBS. SOME PREFABRICATION MAY BE PERFORMED.
BENT 6.1
BENT 5.2
BENT 4.4
BENT 3.6
BENT 2.7
BENT 1.9
BENT 1.1

C/E/R/ FIGURE 5


NORTH
EXIST. UNMODIFIED STEEL
THESE MEMBERS MAY BE PREFABRICATED PER THE INSTALLER'S DISCRETION BASED ON SELECTED CRANE CAPACITY AND PLACEMENT DURING INSTALLATION.
LOADS SHALL NOT BE MOVED OVER THE REFUELING WATER STORAGE TANKS (RWST).
BENT 1
BENT 2
BENT 3
BENT 4
BENT 5
BENT 6

FORMAL REVIEW MEETING PARTICIPATION DATA SHEET

Review meeting shall not be held if key stakeholders are not present and prepared with filled out comment sheet.

PCM	EP 07-047	Turkey Point Cask Crane - Support Structure Upgrade	
ORIGINATOR	W. PARKER	RESCHEDULED YES/NO	RESCHEDULE DETAILS/OTHER COMMENTS
DATE NOTIFIED	7/25/2008		
MEETING DATE	7/31/2008		
MEETING TIME	1:00 PM		
COMPLETE			

REVIEWER	KEY STAKEHOLDER	DEPT	ACCEPTED DECLINED DELEGATED NO RESPONSE	ATTENDED MEETING YES/NO/ALT	ALTERNATE	PREPARED YES/NO/NA	COMMENT SHT RECEIVED YES/NO/NA	COMMENT YES/NO	COMMENT DATE	HIT ON INDICATOR YES/NO
WURSTER	YES	OPS	ACCEPTED	Y	LITTLE JOHN	Y	Y	N	7/31/08	NO
COFFEY	YES	MAINT	DELEGATED	Y	LITTLE JOHN	Y	Y	N	7/31/08	NO
ZUBIRIA	YES	MAINT		Y		Y	Y	N	7/31/08	
MOWBRAY	YES	SYS	DELEGATED	Y	LEWIS	Y	Y	N	7/31/08	
FLETCHER	YES	SEC	RITTMER	N		Y	Y	N	8/1/08	
DELGADO	NO	ENG		Y		Y	Y	N	7/31/08	
COGDILL	NO	ROC/MAIN	DELEGATED	N	MARKHAM	Y	Y	N	7/31/08	
BOLING	NO	CONFIG		Y		Y	Y	N	7/31/08	
CAPOUELLEZ	NO	QA		YES		Y	Y	N	7/31/08	
COUSINO	NO	PROJ		Y		Y	Y	N	7/31/08	
ANTIGNANO	NO	FP		N		Y	Y	N	7/31/08	

Note 1: A CR is to be written for each occurrence of a meeting that is rescheduled due to failure of key stakeholders to be present and prepared for the review meeting unless

****RETURN DATA SHEET TO Eva Lora X6652****

PC/M COMMENT SHEET

Page 1 of ____

PC/M No.: 07-047 **Rev No.** : Draft **Unit No.**: 00 **Date Due**: ____

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: Brian Carberry Department: RP

I have reviewed the subject PC/M and: (check all that apply)

- ☒ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
- ☐ **TRAINING COORDINATOR HAS BEEN NOTIFIED TO REVIEW THE PACKAGE FOR TRAINING NEEDS AND SCHEDULE.**
- ☐ have no comments.
- ☒ have the following comments. Additional comments on page(s) ____
- ☒ have determined no procedures are affected for my department.
- ☐ have determined procedures are affected and have listed them on page(s) ____
- ☐ a system functional test is not required.
- ☐ a system functional test is required.
- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department. ____ (Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: B M Carberry Date of Review 9/5/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
____	____	☐	☐	☐	____
____	____	☐	☐	☐	____
____	____	☐	☐	☐	____
____	____	☐	☐	☐	____
____	____	☐	☐	☐	____

Additional procedures are listed on page(s) ____.

COMMENTS	COMMENT RESOLUTION
Disposition of radioactive spoils and/or old structural steel should be addressed or referenced in the PC/M.	THIS DETAIL WILL BE INCORPORATED EITHER BY REVISION TO THE PC/M OR VIA CRN.

I have reviewed and concur with the comment resolutions. Number of pages 1

Signed: B M Carberry

Resolution Prepared By:

Signed: D. Mercer 9/5/08

PC/M COMMENT SHEET

PC/M No.: EP 07-047 **Rev No. :** 000 **Unit No.:** 00 **Date Due:** 6/19/08

Title: Turkey Point Cask Crane Support Structure Upgrade

Name of Reviewer: Wurster Department: Operations

I have reviewed the subject PC/M and: (check all that apply)

- ☑ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
- ☐ **TRAINING COORDINATOR HAS BEEN NOTIFIED TO REVIEW THE PACKAGE FOR TRAINING NEEDS AND SCHEDULE.**
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- ☐ a system functional test is required.
- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department._____(Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: _____ Date of Review 7/31/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION

I have reviewed and concur with the comment resolutions. Number of pages_____

Signed:_____

Resolution Prepared By:

Signed:_____

PC/M COMMENT SHEET

Page 1 of _____

PC/M No.: EP 07-047 Rev No. : 000 Unit No.: 00 Date Due: 6/19/08

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: LITTLEJOHN FOR COFFEY Department: MECH/MAINT

I have reviewed the subject PC/M and: (check all that apply)

- ☐ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department._____(Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: _____ Date of Review 7/31/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION
NONE	

I have reviewed and concur with the comment resolutions. Number of pages_____

Signed:_____

Resolution Prepared By:

Signed:_____

PC/M COMMENT SHEET

PC/M No.: EP 07-047 **Rev No.**: 000 **Unit No.**: 00 **Date Due**: 7/31/08

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: CLAUDIO ZUBIRIA Department: PLANNING

I have reviewed the subject PC/M and: (check all that apply)

- ☑ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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- ☐ a system functional test is required.
- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department.____(Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: _____ Date of Review 7/31/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION

I have reviewed and concur with the comment resolutions. Number of pages_____

Signed:_____

Resolution Prepared By:

Signed:_____

PC/M COMMENT SHEET

PC/M No.: EP 07-047 **Rev No. :** 000 **Unit No.:** 00 **Date Due:** 6/19/08

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: JOHN LEWIS Department: ART ENGINEERING

I have reviewed the subject PC/M and: (check all that apply)

- ☐ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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- ☐ have determined procedures are affected and have listed them on page(s)_____
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- ☐ a system functional test is required.
- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department._____(Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: John Lewis Date of Review 7-2-2008

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION
PAGE 11 STATES PORTABLE CRANE AVAILABLE - HAVE WE DETERMINE WHAT SIZE PORTABLE WOULD BE REQUIRED TO THE PROJECT INCLUDING A MAINTENANCE RULE SCOPING DOCUMENT FOR USE BY PTN FOR THE STRUCTURE	YES.-LTM150 and LTM1400 YES.- Will issue by 8/31/08 Will copy J. LEWIS
PROCEDURES USED DURING CONST. WILL THEY BE REVIEWED & APPROVED BY SITE OR THE PROJECT	Both Project and Site will review dismantling & installation sequence and procedures
WHAT, IF ANY SPARES REQUIRED FOR THIS STRUCTURE - NONE	SPARE BOLTS-15%

I have reviewed and concur with the comment resolutions. Number of pages 2

Signed: for J. Lewis

Resolution Prepared By:

Signed: W Parker 8/13/08

Wyatt Jenkins
07/16/2008 07:30 AM

To: Walter Parker/Ptn/Nuclear/FplNuc@FplNuc, Andy Zielonka/Ptn/Nuclear/FplNuc@FplNuc
cc:
Subject: Mobile Cranes to be used to replace the cask crane

Walt/Andy here is the crane that we will be using to perform the work on the Cask Crane structure. Please forward to the appropriate WGINT person.

wj
----- Forwarded by Wyatt Jenkins/Ptn/Nuclear/FplNuc on 07/16/2008 07:25 AM -----

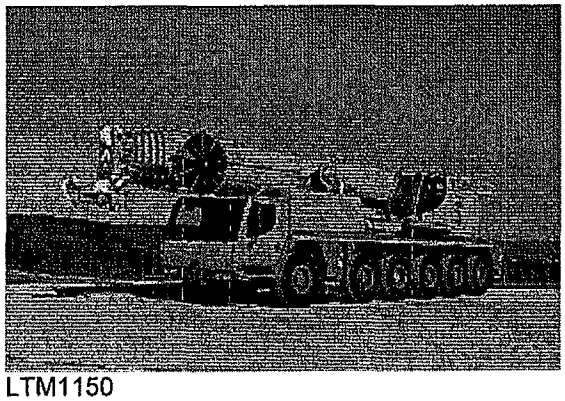
Scott A Cousino
07/15/2008 03:04 PM

To: Wyatt Jenkins/Ptn/Nuclear/FplNuc@FplNuc
cc: Vincent Ursitti/Juno/Nuclear/FplNuc@FPLNUC
Subject: Mobile Cranes to be used to replace the cask crane

Larry Williams reported today: The plans are to use either the LTM1400 or LTM150

LTM1400

depending on the required load capacity for the larger of the two cranes and to use the LTM1150 for the smaller.



LTM1150

Scott Cousino
Florida Power and Light
Nuclear Projects

PC/M COMMENT SHEET

PC/M No.: 07-047 **Rev No.:** E **Unit No.:** 00 **Date Due:** 7/31/08

Title: Turkey Point Cask Crane - Support Structure Upgrade - 90% Implementation Review

Name of Reviewer: Brent Rittmer Department: Security

I have reviewed the subject PC/M and: (check all that apply)

- ☐ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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- ☒ have no comments.
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- ☐ have determined procedures are affected and have listed them on page(s)_____
- ☐ a system functional test is not required.
- ☐ a system functional test is required.
- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department._____(Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: Brent Rittmer Date of Review 8/4/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION
There are Project/Security interfaces and potential interferences that need to be worked out.	

I have reviewed and concur with the comment resolutions. Number of pages_____

Signed:_____

Resolution Prepared By:

Signed:_____

PC/M COMMENT SHEET

PC/M No.: EP 07-047 Rev No.: 000 Unit No.: 00 Date Due: 6/19/08

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: J.A. DELGADO Department: ENG

I have reviewed the subject PC/M and: (check all that apply)

- ☐ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department._____(Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed:_____ Date of Review_____

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
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		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION
1. Please consider the impact of PC/M 07-058 in the Design Integration section of the PC/M (Sec. F.3)	(1) PC/M 07-050 WILL ADDRESS INTERFERENCES ASSOCIATED WITH THE PTN CASK CRANE UPGRADES. THEREFORE, DESIGN INTEGRATION OF PC/M 07-058 WILL BE ADDRESSED IN PC/M 07-050, COMMENT INCORPORATION IN THIS PC/M IS THEREFORE NOT REQUIRED.
2. Section VI.4 of PC/M on Maintenance guidelines should indicate the Maint. Rule aspects of structure need to be revisited to include any new requirements - Current structure is already in MTR program for PTN.	(2) THE FOLLOWING WORDING WILL BE INCORPORATED IN SECT VI.4: "UPGRADED CASK CRANE SUPPORT STRUCTURE IS BEING RECLASSIFIED AS A CONT NEXT PG
I have reviewed and concur with the comment resolutions. Number of pages 2	Resolution Prepared By:
Signed: J.A. Delgado	Signed: V. A. URSITTI

PC/M COMMENT SHEET
PC/M COMMENT CONTINUATION SHEET

PC/M No.: 07-047 Rev No.: 0 Unit No.: 00 Date Due:

Name of Reviewer: J. A. DELGADO Department: ENG

COMMENTS	#2 CONT' COMMENT RESOLUTION
3. Under Section V.1, need to specify different reference for grout. FPL specification SPEC-C-042 & site grout procedures need to be referenced/used. Testing provisions need to be clarified in the PC/M.	SEISMIC CATEGORY I, SAFETY RELATED CLASS 1 STRUCTURE TO SUPPORT THE NEW SINGLE FAILURE PROOF CRANE FOR HANDLING SPENT FUEL CASKS, AS SUCH, THE RESPONSIBLE SYSTEM ENGINEER NEEDS TO REVIEW THE CURRENT MAINTENANCE RULE SCOPING DOCUMENT FOR THIS STRUCTURE FOR UPDATES REQUIRED TO ADDRESS THE UPGRADED STRUCTURE CLASSIFICATION. TRACKED UNDER CR 2008-25663.
4. Under Section V.1, need to specify Anchor Bolt specification for installation of handrails and any location requiring anchor bolts. FPL specification CN-2.24 & applicable plant procedures should be referenced/used.	(3) SPEC-C-042 "SPECIFICATION FOR GROUT" WILL BE ADDED TO THE SECT IV.5 LIST OF REFERENCES. ALSO, THE REFERENCE FOR GROUT UNDER SECT V.1 WILL BE CHANGED TO THE NEW GROUT SPEC REFERENCE NUMBER. (3 & 4) APPROPRIATE WORDING WILL BE ADDED TO SECT V1.1 IN THE PC/M TO LIST PROJECT SPECIFIC SPECIFICATIONS AS WELL AS TO INDICATE THAT ~~UNLESS OTHERWISE NOTED IN THIS SPECIFICATION~~ TIONS AS WELL AS TO INDICATE THAT UNLESS OTHERWISE NOTED IN THIS PC/M OR ITS REFERENCED SPECIFICATIONS, THAT ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH APPLICABLE PLANT PROCEDURES AND SPECIFICATIONS. THE PTN ISFSI PROJECT STAFFING WILL INCLUDE QUALIFIED QC PERSONNEL THAT WILL ENSURE COMPLIANCE WITH ALL SPECIFICATION TESTING AND INSPECTION REQUIREMENTS

I have reviewed and concur with the comment resolutions. Number of pages 2

Signed: J A Delgado

Print: J.A. DELGADO Date: 8/13/08

Resolution Prepared By:

Signed: Vincent A. Uroitis

Print: VINCENT A. UROITIS Date: 8/12/08

PC/M COMMENT SHEET

PC/M No.: EP 07-047 Rev No.: 000 Unit No.: 00 Date Due: 6/19/08

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: R.G. Markham Department: Maintenance (Mech)

I have reviewed the subject PC/M and: (check all that apply)

- ☐ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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- ☒ have determined no procedures are affected for my department.
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- ☐ a system functional test is not required.
- ☐ a system functional test is required.
- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department._____(Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: R.G. Markham Date of Review 7/31/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION
_____	_____
_____	_____
_____	_____
_____	_____
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_____	_____
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_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

I have reviewed and concur with the comment resolutions. Number of pages_____

Signed:_____

Resolution Prepared By:

Signed:_____

PC/M COMMENT SHEET

PC/M No.: EP 07-047 **Rev No.**: 000 **Unit No.**: 00 **Date Due**: 6/19/08

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: Steve Boling Department: PTN Eng

I have reviewed the subject PC/M and: (check all that apply)

- ☒ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: _____ Date of Review 7/31/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
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_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION
No Config-related comments at this time	

I have reviewed and concur with the comment resolutions. Number of pages_____

Signed:_____

Resolution Prepared By:

Signed:_____

PC/M COMMENT SHEET

PC/M No.: 07-047 Rev No. : 000 Unit No.: 00 Date Due: 7/31/08

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: Daniel Capouellez Department: PTN - QA

I have reviewed the subject PC/M and: (check all that apply)

- ☒ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: [signature] Date of Review 7/31/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements Prior to ITOP	For SATS	Post Turnover	Responsible Individual
		☐	☐	☐	
		☐	☐	☐	
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		☐	☐	☐	
		☐	☐	☐	

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION
Page 25 of 26 references SPEC-C-099 but I could not find this specification. I did find SPEC-C-007, Erection of Structural and Misc Steel, which would appear to be the correct reference.	SPEC-C-099 IS A STEEL FAB. SPEC. IT IS [redacted] A ONE TIME USE SPEC. AND IS IN PASSPORT BUT NOT IN LOTUS NOTES
Page 25 of 26 also references CN-2.9 and CN-2.11. CN-2.9 specifies that Engineering will approve the concrete mix design and submit it to FPL QC; CN-2.11 and SPEC-C-007 specify QC inspection by the Owner (FPL) for concrete, struc. steel erection, and high strength bolting. The QATR now allows peer inspection. Suggest clarification in PCM.	PROJECT INTENDS TO USE THE SPEC-C-007 AND CN-2.11 REQ'S AND TO USE QUALIFIED QC INSPECTOR - HIRED SPECIFICALLY FOR THIS PROJECT.

I have reviewed and concur with the comment resolutions. Number of pages 1

Signed: [signature]

Resolution Prepared By:

Signed: [signature]

10,14,15, (
19

PC/M COMMENT SHEET

PC/M No.: 07-047 **Rev No.:** E **Unit No.:** 00 **Date Due:** ____

Title: PTN Cask Crane Support Structure Upgrade

Name of Reviewer: Scott Cousino Department: Projects

I have reviewed the subject PC/M and: (check all that apply)

- ☒ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
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- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department. ____ (Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: COUSINO Date of Review 7/31/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
____	____	☐	☐	☐	____
____	____	☐	☐	☐	____
____	____	☐	☐	☐	____
____	____	☐	☐	☐	____
____	____	☐	☐	☐	____

Additional procedures are listed on page(s) ____.

COMMENTS	COMMENT RESOLUTION
1. The ability to respond to a fire or casualty may be hindered during the construction and operation of the crane. This should be addressed and commented upon by Fire Protection.	John Antignano has reviewed the PC/M and his comments will be incorporated.
2. The Construction/Erection sequence is provided; however, it is my understanding that the information included in the PC/M has been determined to be inaccurate and the correct sequence will be CRN'd into the package. If this is the case, acknowledgement of this fact should be made within the text of the PC/M.	Sect VI.1: Implementation Instructions/Specifications revised to read — See Attach #12 for a suggested implementation sequence. "shall" revised to "may"
3. Page 10 of 26 I.5.8 Third Paragraph: should read, "...and all non-used bolt holes may be filled..."	
4. Page 14, under the heading of PTN Commitments and Administrative Procedures, the	

Scott A — 08

sixth sentence should read: "The cask crane upgrade installation should be reviewed against the requirements of procedure 0-ADM-217." Also, in this same section, delete the following text: "is considered to be an 'infrequently performed evolution' per....will be prepared per procedure 0-ADM217 requirement." and "This will also be covered under.....to procedure 0-ADM-217." The site team will determine to what extent ADM-217 applies and the necessary actions.	- Revised.
5. Page 15, second paragraph under the heading Buried Structures/Utilities: The modification states that since the caissons are augured in place vibratory motions will not be imposed on the intake structure or other underground utilities. However, once the shafts are augured, the Rammed Aggregate Pier is fabricated by using vertical impact ramming layers of aggregate into place. It seems that this may impart similar vibratory motions.	Discussed with the reviewer. No 'rammed aggregate pier' is to be used.
6. Page 15. Under the heading I.8.9. This section seems to state that all material used for the construction of the crane support structure will be either PC1 or PC2; however, there may be material, such as paint and other minor components that can acceptably procured as PC3. Acknowledgement of this fact should be made in this paragraph.	Added note.
7. Page 18 under II.3 Design Integration Review, second paragraph. Delete the last sentence. It reads: "The critical coordination required between this PC/M and PC/M 07-048 is that the crane can only be removed when the cask crane support structure upgrade is complete."	sentence deleted.
8. Page 19, under the heading of Plant Restrictions. The first sentence should read, "The Cask Crane will be used in the future for handling the spent fuel storage and transport casks as well as maintenance and plant operational tasks."	revised.
9. Under the same heading, the third bullet: Delete the sentence that reads "The fence will be restored at the end of the workday and security will provide coverage while the fence is removed."	deleted.

I have reviewed and concur with the comment resolutions. Number of pages _____

Signed: _____

Resolution Prepared By:

Signed: [signature] 8/6/08

PC/M COMMENT SHEET

PC/M No.: EP 07-047 Rev No.: 000 Unit No.: 00 Date Due: 6/19/08

Title: Turkey Point Cask Crane - Support Structure Upgrade

Name of Reviewer: John Antignano Department: Fire Protection

I have reviewed the subject PC/M and: (check all that apply)

- ☐ **FULFILLED MY ACCOUNTABILITIES AS SET FORTH IN ENCLOSURE 1.**
- ☐ **TRAINING COORDINATOR HAS BEEN NOTIFIED TO REVIEW THE PACKAGE FOR TRAINING NEEDS AND SCHEDULE.**
- ☐ have no comments.
- ☐ have the following comments. Additional comments on page(s)_____
- ☐ have determined no procedures are affected for my department.
- ☒ have determined procedures are affected and have listed them on page(s)_____
- ☐ a system functional test is not required.
- ☐ a system functional test is required.
- ☐ the modifications do not affect my department. Engineering may sign the System Acceptance Turnover Sheet for my department._____(Initial)

For System Engineer only

- ☐ spare parts validated (EPs/MEPs)

Signed: _____ Date of Review 7/28/08

AFFECTED PROCEDURES:

Type	Number	Distribution Requirements: Prior to ITOP	For SATS	Post Turnover	Responsible Individual
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____
_____	_____	☐	☐	☐	_____

Additional procedures are listed on page(s) _____.

COMMENTS	COMMENT RESOLUTION
Based upon the review made there seems to be major ongoing work for this P/CM. It is recommended that the following Fire Protection procedures be added to the reference and reviewed by the department implementing this P/CM to ensure procedure adherence.	REFERENCE TO THESE ADMs HAS BEEN ADDED TO THE PC/M.
0-ADM-016, 0-ADM-016.1, 0-ADM-016.5	

I have reviewed and concur with the

comment resolutions - Number of pages	Resolution Prepared By:
Signed:	Signed:

8/11/08

Comment Form

Doc ID	Doc No.	Doc Rev.	Review Code **	Project	Date Reviewed
PC/M	07-047	E	AC	PTN Cask Crane	8/5/08
Doc Title	Turkey Point Cask Crane –Support Structure Upgrade				

Comments Submitted By: V A. Ursitti	Resolved By:	Acceptance
Comments	Resolution	Concurrence
1. Pg 6/26, Holdpoint #2 and pg 26/26, Ref #23: The design work for this Mod is being done out of the FPL Juno Beach office. As such the engr eval number should be PTN-ENG-**SECJ**-08-035, rather than **SECS**. This number is OK as is, but if WGInt pulls anymore eval numbers, please use **SECJ**.	1. O.K.	OK Vau 8/14/08
2. Pg 6/26, Holdpoint # 4: Upon issuance of Dedication Report Engr Eval PTN-SECJ-08-025, Holdpoint # 4 goes away. The entire document should be word searched to make sure all occurances of reference to this holdpoint are deleted. This change should be part of Rev 0 issuance of the PC/M.	2. O.K.	OK Vau 8/14/08
3. Pg 7/26, Sect I.2, 2nd to last sentence of the paragraph: Please reword this sentence from '***It will also be adequate under a 225 mph tornado wind loading (without a loaded cask).***' to '***The cask crane support structure has also been designed to withstand the PTN design basis tornado wind load of 225 mph with no load and the crane parked and locked down in one of its two lock down positions.***' This change should be part of Rev 0 issuance of the PC/M.	3. Revised	OK Vau 8/14/08
4. Pg 7/26, Sect I.3: Please add '***Reference IV.5.22***' to the end of the 2nd paragraph sentence. This change should be part of Rev 0 issuance of the PC/M.	4. O.K.	OK Vau 8/14/08
5. Pg 10/26, Sect I.5.8, last paragraph: It is anticipated that there could be some discovery of corrosion on the existing structural members that will remain that may not have been captured during the condition assessment	5. Revised. However, this is reversal of FPL position on the Inspection Report (Report No.29142-01) and contradicts the recommendations therein, accepted	OK Vau 8/14/08

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NA = Not approved
R = Reviewed

Comments Submitted By: V A. Ursitti	Resolved By:	Acceptance
Comments	Resolution	Concurrence
inspection. FPL is not convinced that use of a non-structural remetalizer is an appropriate application for repair of existing areas of structural degradation or for filling unused bolt holes. FPL plans that during the structure upgrade work that all work orders will contain direction to responsible field engineers to look for, identify and characterize areas of structural degradation/corrosion. A log of these areas will be kept and each identified area will be inspected by a responsible engineer that will determine an appropriate remedy (i.e. either buff and paint or weld repair). Therefore, please replace the subject sentence with the following sentence: "***FPL will, during progression of the work, identify, characterize, assess and recommend an appropriate remedy for all areas of structural degradation/corrosion found on the structural members to remain.***" This change should be part of Rev 0 issuance of the PC/M.	and approved by FPL. Does the Inspection Report now need to conform to the PC/M? .	
6. Pg 12/28, Sect I.7, Design Evaluation, 1st para, 4th sentence: please unpluralize the word 'hooks'. This change should be part of Rev 0 issuance of the PC/M.	6. Done	OK Vau 8/14/08
7. Pg 12/28, Sect I.7, Justification, 1st para, last sentence: the existing isolated footings are **not** being modified. Please be more specific with respect to what is being discussed here. This change should be part of Rev 0 issuance of the PC/M.	7. revised	OK Vau 8/14/08
8. Pg 13/28, Sect I.8.1, end of 4th sentence: it is indicated to '(refer to Installation Guide for details). Are 'Installation Guidelines' meant to mean Attachment 12? If so, so state, if not then provide a reference. This change should be part of Rev 0 issuance of the PC/M.	8. yes- revised.	OK Vau 8/14/08
9. Pg 14/26, sect I.8.7, Internal/External Flooding, 2nd sentence: This sentence, as written implies that the	9. Noted. Will be done for Rev.1.	

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Comments Submitted By: V A. Ursitti	Resolved By:	Acceptance
Comments	Resolution	Concurrence
effects of external flooding was considered in the Ref IV.5.7 calc (FPL-001-CALC-002). The calc was reviewed to confirm this claim and there is no evidence that external flooding was considered in this calc. Since external flooding criteria was appropriately written into the WGInt DCD (Ref IV.5.11), it needs to be considered and the subject calc needs to be revised to demonstrate this consideration and confirm this PC/M statement. Note this change can be part of Rev 1 of the PC/M.		FPL WILL CONFIRM CONSIDERATION OF FLOODING IN CALC 002, REV 1, THIS COMMENT RESOLUTION IS ACCEPTABLE Vall 8/14/08
10. Pg 15/26, Sect I.8.8, Buried Structures/Utilities, 1st para, 2nd sentence: It is true that the entire proposed haul path has been qualified for the DSC transporter. It is also true that the narrow road between the Aux bldg and the east side A-frames has not been qualified for the DSC transporter. The reason for this is that it is not part of the haul path. The 2nd sentence as written indictes that the sketch provided in Att 11 depicts the PTN ISFSI haul path. This is incorrect. The sketch provided in Att 11 does not match the Haul path sketch in either Calc FPL012-CALC-015, App F pg 2/9 or, PC/M 06-011, labeled as FPL012-SK-008. So, the sketch provided as ATT 11 to this PC/M needs to be replaced with the correct sketch. Also, as far the rest of the paragraph goes, to say that "All utilities under the east heavy haul road (used by ISFSI cask loaded vehicle) are expected to be satisfactory for the imposed loading by the mobile crane /steel components during installation of this design change." is not adequate or acceptable. This must be demonstrated by calculation or evaluation. THIS SAME COMMENT HAS BEEN MADE IN NUMEROUS PREVIOUS REVIEWS AND MUST BE APPROPRIATELY ADDRESSED. It is understood that Ref IV.5.23 is and underground evaluation on the west side of the east A-frames, but this does not address the haul road on the east side of the east A-frames. One approach may be to compare the wheel/outrigger loads of the several mobile cranes that have been proposed for use in performing the steel upgrades with the wheel and jack loads of the DSC in calc FPL012-CALC-015.	10. This Section has been revised. The revised text reflects the results from the Underground Evaluation (with FPL comments on the Evaluation Implemented).	OK Vall 8/14/08

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Comments Submitted By: V A. Ursitti	Resolved By:	Acceptance
Comments	Resolution	Concurrence
This change should be part of Rev 0 issuance of the PC/M.		
11. Pg 15/26, Sect I.8.8, Buried Structures/Utilities, 2nd para, 4th sentence: it is stated that "The augered piles will be driven a minimum of 30 ft dep into the rock stratum to resist the uplift forces". The dwgs in Rev A of pile spec SPEC-C-102 shows some piles are only 20 ft into the stratum. Recommend rewording this sentence as follows: "***The augered piles will be installed to a depth necessary to resist uplift forces.***" This change should be part of Rev 0 issuance of the PC/M.	11. Revised.	OK Vau 8/14/08
12. Pg 17/26, Sect I.9, Design Verification Statement, last paragraph: The reference IV.55.21 is incorrect. It should be 22. Please correct. This change should be part of Rev 0 issuance of the PC/M.	12. Done.	OK Vau 8/14/08
13. Pg 17/26, Sect II.1, Description and Purpose, 3rd para, 2nd sentence: Please delete this sentence, as it has no meaning and no added value to this PC/M. This change should be part of Rev 0 issuance of the PC/M.	13. Disagree.	OK Vau 8/14/08
14. Pg 19/26, sect II.4, Failure Modes and Effects Analysis, 1st para, last sentence: The subject calculation is not on hold because of 'selection of erector'. The calculation has been issued as Rev A on 8/4/08. The holdpoint exists pending acceptance of the stability calculation by FPL. Please revise this sentence accordingly. Also, please revise the hold point # 3 discussion on pg 6/29 accordingly. This change should be part of Rev 0 issuance of the PC/M.	14. Revised.	OK Vau 8/14/08
15. Pg 19/26, Sect II.5, Plant Restrictions, 2nd bullet: discussion with B. Galunic during development of the stability calculation included possible consideration of locking down the crane over the center bays during support structure upgrades. Please generalize this 2nd	15. Per discussion with the commenter and WGI's Galunic, Liaw and Pal on 8/12/08 (11:40 A.M.) the text in PC/M is correct.	OK Vau 8/14/08

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Comments Submitted By: V A. Ursitti Comments	Resolved By: Resolution	Acceptance Concurrence
bullet statement as follows: "***The cask handling crane will be parked and locked down at some evaluated location on the support structure while the structural upgrades are taking place.***" This change should be part of Rev 0 issuance of the PC/M.		
16. Pg 21/26: FPL believes the following dwgs should be included in the affected dwg list and reason for this belief. Also these dwgs, with appropriate mark-ups, need to be part of the set of affected dwgs included in the PC/M: Note this change can be part of Rev 1 of the PC/M: a) 5610-C-273: to show footprint and wall anchors b) 5610-C-274: to show footprint and wall anchors c) 5610-C-276: to show footprint and wall anchors d) 5610-C-284: to show footprint and wall anchors e) 5610-C-23-597 to delete existing rail clip spacers f) 5610-C-23-647 to reference new design dwgs g) 5610-C-23-648 to reference new design dwgs h) 5610-C-23-649 to reference new design dwgs i) 5610-C-23-650 to reference new design dwgs j) 5610-C-23-651 to reference new design dwgs k) 5610-C-23-652 to reference new design dwgs l) 5610-C-23-653 to reference new design dwgs m) 5610-C-23-654 to reference new design dwgs n) 5610-C-23-655 to reference new design dwgs o) 5610-C-23-669 to reference new design dwgs p) 5610-C-23-766 to reference new design dwgs q) 5610-C-23-767 to reference new design dwgs r) 5610-C-23-768 to reference new design dwgs s) 5610-C-23-769 to reference new design dwgs t) 5610-C-23-770 to reference new design dwgs u) 5610-C-23-771 to reference new design dwgs v) 5610-C-23-772 to reference new design dwgs w) 5610-C-23-773 to reference new design dwgs x) 5610-C-23-774 to reference new design dwgs y) 5610-C-23-775 to reference new design dwgs z) 5610-C-23-776 to reference new design dwgs aa) 5610-C-23-777 to reference new design dwgs	16. Planned CRN for inclusion of the new fabrication drawings once submitted and approved will include the affected existing vendor documents referred to. 5610-C-23-597 shall be added to the affected list. New drawing 5610-C-1910 sh. 1 contains the new information. 5610-C-273 is a plan at 18'-0" elevation. (**not to be used**) 5610-C-274 is a plan at 18'-0" elevation. (**not to be used**) 5610-C-284 is a plan at 18'-0" elevation. (**not to be used**) 5610-C-276 section "A" can be used to reference the anchorage for 3.6. (**to be part of revision containing hold point release**) 5610-C-275 section "K" can be used to reference the anchorage for 2.7. (**to be part of revision containing hold point release**) 5610-C-286 section "K" can be used to reference the anchorage for 4.4. (**to be part of revision containing hold point release**)	Comment resolution is not accepted. Resolution will be addressed as part of Rev. 1 Vail 8/14/01

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Comments Submitted By: V A. Ursitti Comments	Resolved By: Resolution	Acceptance Concurrence
bb) 5610-C-23-778 to reference new design dwgs cc) 5610-C-23-779 to reference new design dwgs		
17. Pg 26/26, sect V.1, Equipment and Material, and the Reference list above it: please add the PTN grout SPEC-C-042 to the reference list and change the current reference for the grout to the newly added grout reference. This change should be part of Rev 0 issuance of the PC/M.	~~16~~ 17. Added. Same comment came from J. Delgado.	OK VAU 8/14/08
18. Pg 26/26, sect V.1, Equipment and Material, Anchor bolts/rods: Is reference IV.5.18 an appropriate reference for anchor bolts/rods? Perhaps it should be IV.5.17. This change should be part of Rev 0 issuance of the PC/M.	~~17~~ 18. revised.	OK VAU 8/14/08
19. Pg 26/26, sect VI.2.1: Please add the new grout reference to the item. This change should be part of Rev 0 issuance of the PC/M.	~~18~~ 19. Done. Comment was not incorporated VAU 8/14/08	
20. Pg 26/26, sect VI.2.3: please refer to earlier comment/discussion regarding the use of remetalizer and revise this statement accordingly. This change should be part of Rev 0 issuance of the PC/M.	~~19~~ 20. Please refer to earlier response in item 5.	OK VAU 8/14/08
21. Dwg 5610-C-252 mark-up: West side inclined column of bent W2.7 is also being modified. Why is this not bubbled up? Please identify all affected areas by bubbling. Note this change can be part of Rev 1 of the PC/M.	21 5610-C-252 sh.1 changes to be reflected in Rev. 1.	OK VAU 8/14/08
22. Dwg 5610-C-291 mark-up: Although the W2.7, 3.6 and 4.4 pedestals are shown on this dwg, they are not bubbled up. In order to make the new bubble under the reference dwgs list meaningful, the pedestals should be bubbled also and tied to the bubble under the ref dwg list. Please identify all affected areas by bubbling. Note this change can be part of Rev 1 of the PC/M.	22 5610-C291 changes to be reflected in Rev. 1.	OK VAU 8/14/08

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Comments Submitted By: V A. Ursitti	Resolved By:	Acceptance
Comments	**Resolution**	**Concurrence**
23. The 4th dwg in the series of marked up dwgs is labeled as 5610-C-253. This dwg is actually 5610-C-292 please correct. Also, similar to the previous comment, in order to make the new bubble under the reference dwgs list meaningful, the affected areas should be bubbled and tied to the bubble under the ref dwg list. Please identify all affected areas by bubbling. Note this change can be part of Rev 1 of the PC/M.	23 Drawing mistake corrected and sent to PTN 8-5-08 for review. 5610-C-253 sh.1 changes to be reflected to Rev. 1. 5610-C-252 sh.1 changes to be reflected in Rev. 1. 5610-C-292 bubbles to be added to tie references and notes to be updated to match bubbles, changes to be reflected to Rev. 1	OK Van 8/14/08
24. Dwg 5610-C-384: similar to the previous comment, in order to make the new bubble under the reference dwgs list meaningful, the affected areas should be bubbled and tied to the bubbles under the ref dwg list and notes. Please identify all affected areas by bubbling. This change should be part of Rev 0 issuance of the PC/M.	24 New Bubbles to be added to tie notes to affected area. Changes to be added to Rev. 0.	OK Van 8/14/08
25. Dwg 5610-C-651: Why aren't other sections for which details are changing (i.e. sect G, sect M etc) also bubbled up on this dwg? Need to review and compare with new steel design dwgs all existing details and bubble up as appropriate. This change should be part of Rev 0 issuance of the PC/M.	25 Section G contains information that should stay unchanged but a note shall be added to tie to the new drawings. 5610-C-1908 sh.1 and sh.2. Section M shall contain a note referencing the new drawing containing the angle change, drawing 5610-C-1908 sh.2. Changes to be reflected to Rev. 0	OK Van 8/14/08
26.	~~26.~~	

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DESIGN CHANGE PRE-JOB BRIEF FORM

EP/MEP NO. 07-047

Supervisor Performing Brief: Walter J. Parker	**Date of Brief:** 07/29/2008
Participants: Walter Parker — Erica Buffington Mark Strouse — WGInt Al Doxey — ACECO	**EP/MEP No.** 07-047 (PTN Common) NOTE: Delineate MEPs by adding an "M" at end of the number.
Design Change Description: Cask Crane Support Structure Upgrade from Class III to Class I.	
Resources and Estimated Time to Complete:	**Project Due Date: October 2008**

Minimum Briefing Expectations	Key Briefing Points
Define Scope Clearly define the design change and what the change entails (scope). Discuss how the scope was validated.	• PC/M 07-047 is to upgrade the existing cask crane support structure from Class III to Class I design requirements in order to support the safety related function of handling a fully loaded spent fuel cask with a upgraded single failure-proof cask crane. • Scope was validated through extensive reviews, correspondence and meetings among FPL (NPE), the A/E (WGInt), the Crane Manufacturer (ACECO) and PTN Stakeholder Departments. • Scope was validated against the scope of previously completed Cask Crane Upgrade Projects at SBK and PSL.
Roles and Responsibilities Clearly define Roles and Responsibilities (preparer, verifier, non-Lead engineers, system engineer, start-up engineer, implementation support, project coordinator, corporate, Non Station Personnel, etc.).	• PC/M 07-047 shall be prepared by WGInt • ACECO shall provide crane/support structure interface requirements and interactions at the crane rail interface. • FPL shall provide contractor oversight and review and approval of all deliverables. • Project Managers shall manage scope, schedule and budget. • Project Engineering Managers shall manage the design development process, including calculations, drawings, specifications, technical reports, design inputs and Plant Change/Modification package development. • Lead Discipline Engineers shall be responsible for the technical adequacy of engineering projects. • The entire Project Team participated in the development of the Implementation Plan, along with PTN stakeholders.

DESIGN CHANGE PRE-JOB BRIEF FORM

EP/MEP NO. 07-047

Critical Parameters Assumptions, inputs, or requirements that if allowed to be untrue or **not** met, would adversely affect the design outcome.	• Meets code for Class I Structures • Single Failure Proof • Commercial Grade Dedication • Weights – Crane Capacity Rating • Heavy Lift Limitations • Load Combinations • Constructability of modifications
Procedure/Standards Discuss and ensure proper understanding of the procedures and standards applicable to the task (e.g. ENG-QIs, NAPs, Standards, industry Codes & Standards) Bring copy (copies) of governing process procedure for the design change to the brief.	See attachment 5.
Experience and capabilities Review personnel experience and capabilities. Establish appropriate mentoring and oversight if appropriate.	• WGInt – fully capable of performing work. Project execution required considerable mentoring and oversight by FPL, since WGInt had not had recent experience in working with FPL and FPL performance standards. • ACECO – original crane manufacture • FPL – helped in design development, assisted in walk downs, trained WGInt on FPL processes and procedures
Lessons Learned Discuss previous lessons learned and experience (OPEX, CRs, HU Briefs & individual) that may be applicable to this design change, particularly those involving human performance errors.	• This is the first time WGInt will be performing a PC/M for FPL. • FPL is providing major oversight to assure the process runs smoothly. • Researched OE from other stations around the FPL fleet such as PSL and Seabrook. • Discuss current OE in weekly project meetings.
Fundamentals Discuss applicable fundamentals (i.e., essential or necessary parts of the design change).	• See Critical Parameters listed above.

Additional Briefing Topics, validate the risk factors chosen with the briefing members.

Consequence Risk Mitigation: For each consequence risk factor identified in Attachment 2, list the factor and the actions to be employed to mitigate that risk.

Risk Factor(s)	Compensating Action(s)	Owner	Due Date
1. Personal injury, safety issue made, or not addressed?	Design considers working at heights and additional safety barriers have been installed to protect workers at elevated working areas.		
	a. Working at heights	WGInt	Complete
	b. Spec-C-013 – Added additional handrail system on SFB roof. MRA 38014811-01 issued 08/12/2008	WGInt	Complete
4. Operator workaround or challenge created or not addressed?	The cask crane will be out of service during this modification. Mobile cranes will be available for use if needed.	Projects	Complete
8. Unbudgeted financial consequences ($100K or more)?	Additional costs have been incurred as a result of evolving design. Form 14 issued for additional scope for PC/M 07-047, dated 08/15/2008	Projects	Complete
11. Adverse impact on outage (>2hours) or project critical path?	Working towards keeping the project on schedule. All Project work planned as non-outage.	Projects	Complete
16. Aggregate review: Are there any activities, conditions, or situations that, when combined with this activity, could cause undesirable consequences?	Project schedule is integrated with site schedule – site schedule has priority.	Projects	Complete
19. Unexpected significant field condition?	a. Existing structure degradation – PC/M includes refurbishment requirements.	WGI	Complete
	b. Existing structure dedication to Class I – Material Testing, Inspection, Dedication Plan.	WGI	Complete
	c. Existing foundations are insufficient for new design – reinforce and extend (add new foundations where required).	WGI	Complete
	d. Tornado Wind Loads are governing design loads – members require higher strengths.	WGI	Complete
	e. Conducted numerous walkdowns, upfront/conceptual design reviews, implementation reviews, design review board meetings, GPR, and soft digs to eliminate unknowns prior to implementation	Projects	Complete

Human Performance Risk Mitigation: For each human performance risk factor identified in Attachment 3, list the factor and the actions to be employed to mitigate that risk.

Risk Factor(s)	Compensating Action(s)	Owner	Due Date
2. Knowledge/experience, low proficiency lack of skills/training/qualifications?	FPL to provide major oversight to WGInt		
	a. Conceptual Review Meeting – 07/01/2008	NPE	Complete
	b. Conduct DRB – 07/17/2008	NPE	Complete
	c. Experienced Engineering Manager with WGInt. Additional knowledgeable Project Engineers assigned	NPE	Complete
	d. Site Structural group Reviews	NPE	Complete
	e. Contracted Independent 3rd Party Review	NPE	Complete
3. First time or non-routine evolution?	WGInt has performed work for FPL, but has no recent experience in working with FPL, its upgrades in standards and the current PC/M process. a. FPL conducted training for WGInt on PC/Ms and 10 CFR 50.59 b. FPL provided In-House Oversight c. On-Site WGInt Assignments to work directly under FPL supervision.	NPE / WGInt	Complete
7. High Complexity?	a. WGInt Chief Engineer Review. Decided the WGInt Chief Engineer Review not required; design is fully developed (8/18/2008).	NPE	Complete
	b. FPL Independent 3rd Party Review of analysis. Completed 8/14/2008.	NPE / WGInt	Complete
	c. FPL extensive and experienced oversight. PC/M package complete for PNSC (8/19/2008).	NPE	Complete
8. Inadequate information available/problem not clearly understood?	Same as Consequence Risk Mitigation Compensating Action 19. Through regular project meetings, including a DRB meeting, the project scope developed and is well understood.	WGInt	Complete
11. High workload/schedule pressure?	Due to time constraints, this project has increased schedule pressures. The project increased resources, implemented additional design development activities and increased the design reviews and reviewers and established a joint team design approach. These measures were implemented to ensure complete, correct and timely design modification development.	NPE / WGInt	Complete
13. Availability of resources (people)?	FPL has hired additional resources to allocate solely to the Cask Crane Upgrade project. WGInt has hired additional members for their working team.	NPE / WGInt	Complete

DESIGN CHANGE PRE-JOB BRIEF FORM

EP/MEP NO. 07-047

Process Risk Mitigation: For each process risk factor identified in Attachment 4, list the factor and the actions to be employed to mitigate that risk.

Risk Factor(s)	Compensating Action(s)	Owner	Due Date
1. Is the exact scope of the task completely understood?	Scope changes continually occurred as the AE gained a clear understanding of all this project entails. FPL is monitoring scope changes and providing documentations. Final scope change authorized 8/15/2008.	WGInt	Complete
4. Is task on a fast track?	Same as Human Performance Risk Mitigation Compensating Action 11. Contracted an Independent 3rd Party Review of the structural analysis to ensure that the design effort is on the right track.	NPE / WGInt	Complete
5. Is an outside organization providing significant inputs?	FPL is monitoring all major inputs. NPE coordinates and facilitates design inputs and exchanges among FPL, the A/E and the crane Manufacturer. Package now complete for PNSC (8/19/2008).	NPE	Complete
9. Are multiple parties involved such that errors may be introduced via communication channels?	ACECO and WGInt are both working together on this project with extensive FPL oversight, including: weekly meetings, onsite joint walkdowns, joint design inputs and development. Package now complete for PNSC (8/19/2008).	All	Complete

Follow-up Actions:

Required? (Y/N)	Follow-up Action	Owner	Date	Tracking Mechanism
	Progress update	NPE		
	Conceptual Design Review	NPE	07/01/2008	Complete
	Implementation Review	NPE	07/17/2008	Complete
	Constructability Walkdown	WGInt	07/31/2008	Complete
	ITPR	NPE	08/13/2008	Complete
	Additional Pre-Job Brief			
	Other (specify)			

Prepared by: W. J. Parker Date: 8/19/2008

Name of design change being screened:		No. of Design Change
Consequence Risk Factors (Ask: If a mistake is made, what can happen?)		**Compensating actions (tools, barriers, actions)** (Suggested actions to reduce or eliminate the risk of making errors)
☒ Yes ☐ No 1	Personal injury, safety issue made or not addressed: • Hot environment/heat stress • Diving activities Hazardous materials • New or recurring Immediately Dangerous to Life or Health (IDLH) atmosphere	Provide additional barriers. Ensure risk areas are identified and safety practices employed. Determine whether to enter Operational Decision Making Process. Make an injury response plan. • **Design considers working at heights.** • **Added additional safety barriers to compensate for the elevated working areas.**
☐ Yes ☒ No 2	Reactivity Mgmt. Event (any level)	Solicit input from Reactor Engineering, Operations, and System Engineer.
☐ Yes ☒ No 3	Regulatory open item created or not addressed (includes environmental, NRC, State Agencies, NEIL, or INPO)	Discuss with Plant Licensing Manager or Senior Licensed Operator. Confirm existing concern with Regulator first hand. (Seek understanding)
☒ Yes ☐ No 4	Operator Workaround or challenge created or not addressed	Involve Operations in design change. Review definition of Operator Work Around. • **The cask crane will be out of service during this modification.**
☐ Yes ☒ No 5	Unplanned Safety System Actuation/Loss	Add review by System Engineer or Operations. Develop recovery plan.

☐ ☒ Yes No 6	Unplanned Component Unavailability	Determine effect on Maintenance Rule, performance indicator, system and plant effects. Consider challenge review board. Use EPIX search for equipment reliability data. Involve the OEM.
☐ ☒ Yes No 7	Scram, Lost/limited Generation (>5%)	Investigate alternative solutions. Involve Operations and System Engineer in solution. Determine whether to enter Operational Decision Making Process. Consider ITPR (Attachment 5).
☒ ☐ Yes No 8	Unbudgeted financial consequences ($100k or more)	Investigate alternative solutions. Request challenge review board based on amount of potential loss or cost increase. Involve Business Operations. • **Constructability costs have increased.** • **Complexities regarding the existing structure have caused the costs to increase.**
☐ ☒ Yes No 9	Tech Spec violation	Review Technical Specification LCO, surveillance requirements, and Bases prior to performing task. Prepare contingency plan. Discuss with Senior Licensed Operator.
☐ ☒ Yes No 10	Unplanned Tech Spec entry into a shutdown LCO	Review Technical Specification LCO, surveillance requirements, and Bases prior to performing task. Prepare contingency plan. Discuss with Senior Licensed Operator.
☒ ☐ Yes No 11	Adverse impact on outage (>2hours) or project critical path	Prepare contingency plan. Consider making a Project or HIT team. Discuss with Outage Management. • **Non Outage work; may have the potential to affect outage activities.** • **Design team and direction.**
☐ ☒ Yes No 12	Radiological release or exposure for this task or future plant work related to this task. • 1 REM for job	Involve Radiation Protection in design change. Prepare contingency plan. ALARA review.

12	• Dose rate > 1 rem/hr • Any unmonitored release • Other	
☐ Yes ☒ No 13	Reportable environmental consequence	Involve Chemistry/Environmental group in design change. Prepare contingency plan. Remove environmental hazard during task. Establish additional barriers.
☐ Yes ☒ No 14	Introduction of foreign material	Investigate alternative methods and materials. Enter Foreign Material Control procedure to establish controls.
☐ Yes ☒ No 15	Unplanned Security vulnerability	Involve Security in decisions and process.
☒ Yes ☐ No 16	Aggregate review: Are there any activities, conditions, or situations that, when combined with this activity, could cause undesirable consequences?	Consider rescheduling task, changing the other activity, condition or activity. Develop schedule or fragnet to manage simultaneous activities. • **Integration with site schedule.**
☐ Yes ☒ No 17	Repeat functional failure of Maintenance Rule systems, structures or components or has the potential to create new (a)(1) system.	Consider likelihood of repeat failures in establishing design change. Solicit input from Maintenance Rule coordinator/SCE. Obtain Plant Health Committee approval. Address extent of condition.
☐ Yes ☒ No 18	Reactor coolant or steam generator chemistry transient outside of acceptable band.	Involve Chemistry. Involve Operations and/or System Engineer in design change. Prepare contingency plan. Establish additional barriers. Discuss with Nuclear Fuels or Reactor Engineering.

☒ Yes ☐ No 19	Unexpected significant field condition.	Provide additional barriers to minimize unknowns. Ensure thorough walkdowns during design stage. Involve implementing department to remove barriers to walkdown. If walkdowns cannot performed during design, schedule walkdowns when system(s) are accessible.
☐ Yes ☒ No 20	Unanticipated start-up issues for new or modified equipment.	Consider having a Vendor representative present to assist during start-up testing.
☐ Yes ☒ No 21	Other unacceptable consequence not listed • Fire protection comp. actions • Emergency plan affected • NPDES permit affected • High sensitivity issue with public • Potential adverse reduction in safety or production margins • ISFSI • Other	Choose appropriate tools, barriers, or actions and list on briefing sheet.

Prepared by: W. J. Parker Date: 8/19/2008

HUMAN PERFORMANCE RISK FACTORS

EP/MEP NO. 07-047

Name of design change being screened:		No. of Design Change
Human Performance Risk Factors (Ask: What can lead me to make a mistake?)		**Compensating actions (tools, barriers, actions)** (Suggested actions to reduce or eliminate the risk of making errors)
☐ Yes ☒ No 1	Overconfidence/complacency, "can-do attitude"	Emphasize STAR, procedural compliance and place keeping. Consider assigning a trainee to help the design engineer focus.
☒ Yes ☐ No 2	Knowledge/experience, low proficiency lack of skills/training/qualification	Assign a mentor. Review and keep a copy of the governing procedure at the preparer's and reviewer's desk. Add an ITPR, supervisory oversight or challenge review board (CRB) based on potential consequences. Obtain necessary expertise. Consider both Plant expertise and Design abilities. Obtain necessary expertise or collaborative review.
☒ Yes ☐ No 3	First time or non-routine evolution	Assign a mentor; provide supervisory oversight, review inputs, methodology to be used. Review and keep a copy of the governing procedure at the preparer's and reviewer's desk. Consider an ITPR. • **WGInt does not have experience writing PC/M's for FPL**
☐ Yes ☒ No 4	Method changed or new process/procedure	Perform walk-through of new process. Confirm methodology with process owner. Review and keep a copy of the governing procedure at the preparer's and reviewer's desk. Use enhanced place keeping.
☐ Yes ☒ No 5	Infrequently performed	Review lessons learned or previous performance. Perform walk-through of task. Review and keep a copy of the governing procedure at the preparer's and reviewer's desk.
☐ Yes ☒ No 6	Frequently performed (habit intrusion), repetitive actions or monotony	Emphasize STAR, procedural compliance and place keeping. Consider assigning a trainee to help the design engineer focus. Build in breaks or mix of assignments.

HUMAN PERFORMANCE RISK FACTORS

EP/MEP NO. 07-047

☒ Yes ☐ No 7	High Complexity	Assign peer reviewer or assistant. Validate inputs and methodology. Consider Chief Review, ITPR and/or challenge review board. • **WGInt Chief Engineer to sign off on PC/M**
☒ Yes ☐ No 8	Inadequate information available/problem not clearly understood	Gather missing information or decide scope of issue. Involve all stakeholders to define task. Consider Conceptual/Upfront Design Review.
☐ Yes ☒ No 9	Availability/complexity of tools	Consider making tool available from other site, employ expert from another area, or practice with tool on simple task to gain expertise.
☐ Yes ☒ No 10	Group think, lack of independence	Assign an ITPR or challenge review board. Use a "devil's advocate" to argue opposite points.
☒ Yes ☐ No 11	High workload/schedule pressure	Consider rescheduling or reassigning other tasks. Ensure engineering schedule is established with agreed upon due dates. Ensure scope of task is correct. Confirm ACTUAL need for due date. Do not lower standards and base delivery date on an error-free product.
☐ Yes ☒ No 12	Distraction/interruptions	Consider sequestering individual. Assign a point-of contact.
☒ Yes ☐ No 13	Availability of resources (people)	Request assistance from Corporate, another group, department or station. DO NOT lower standards; reschedule this or other tasks. Establish schedule based upon availability of resources.
☐ Yes ☒ No 14	Unclear goals, roles, responsibilities	Establish the deliverables, confirm roles and responsibilities to ensure understanding. Consider creating a Project Plan to document goals, roles, and responsibilities.

HUMAN PERFORMANCE RISK FACTORS

EP/MEP NO. 07-047

☐ ☒ Yes No 15	Lack of or unclear standards	Establish deliverables and quality attributes. Review applicable standards or procedures.
☐ ☒ Yes No 16	Other human performance issues	Choose appropriate tool, barrier, or action and list on briefing sheet.

Prepared by: W. J. Parker Date: 8/19/2008

Procedure No.	Procedure Title:	Page: 1 of 3
PSL-EDI-006, Rev. 0 ATTACHMENT 4	DESIGN CHANGE PRE-JOB BRIEF AND RISK AND CONSEQUENCES ASSESSMENT **PROCESS RISK FACTORS**	APPROVAL DATE: 02/22/08 EP/MEP NO. 07-047

Process conditions that increase the likelihood of making an error.

Remember: "It's my job to produce a quality design change within process"

Name of design change being screened:		No. of Design Change	
Process Risk Factors (Ask: What could Design me to make a mistake?)		**Compensating actions (tools, barriers, actions)** (Suggested actions to reduce or eliminate the risk of making errors)	
☒ Yes ☐ No 1	Is the exact scope of the task completely understood?	Define the task in writing. Involve all stakeholders. Ensure common understanding. Describe desired outcome. • **Scope changes for the AE as further understanding of the project is gained.** • **Clear understanding by FPL.**	
☐ Yes ☒ No 2	Are there parts of the task process/procedure that cannot be followed? Are we Out-of Process (OOPS)? Are there parts of the task the current process does not address?	If Management has decided to proceed, ensure that the risks are repeatedly communicated and accepted by Station leadership. Clearly convey the risk associated with proceeding. Recommunicate the risk just before the consequences can manifest themselves. Otherwise, stop and fix the task's process or get back in process. (Example: Designer's walk down skipped because access to certain parts of containment is not possible at power and design change needed for next outage.) Review and keep a copy of the governing procedure at the preparer's and reviewer's desk.	
☐ Yes ☒ No 3	Are parts of the process or task not understood, unclear, or controversial?	Confirm understanding through consultation with process expert. Establish expectations with Station leadership.	
☒ Yes ☐ No 4	Is task on a fast track?	Establish additional supplemental or parallel reviews. Consider a challenge review board, benchmarking, and OPEX. • **Corporate and Site Reviews in parallel.**	

☒ Yes ☐ No 5	Is an outside organization providing significant inputs?	How will their input be validated? Plant visit, review of their inputs and methods? Inputs, especially Non Station Personnel inputs, should be provided in writing and verified first-hand when possible. Avoid over reliance on Non Station Personnel. Question Non Station Personnel's methodology and assumptions. Ask for industry contacts in similar situation. Contact industry to determine whether or not Non Station Personnel input is within envelope of industry operating experience. Consider an ITPR. • **ACECO and WGInt to exchange information as necessary.**
☒ Yes ☐ No 6	Are the critical parameters known?	Perform walk down of prints and wiring diagrams, validate assumptions. Define the inputs that will influence the outcome. How will drawings and Plant parameters be validated? How will omission errors be detected?
☒ Yes ☐ No 7	Are all the tools, programs, and procedures necessary for the design change available and useable?	Consider training, mentoring, buying a new tool, producing a useable procedure. Review and keep a copy of the governing procedure at the preparer's and reviewer's desk. Establish contingency actions or compensatory measures for weak tools.
☒ Yes ☐ No 8	Is design basis known?	Review UFSAR, applicable Tech Specs, Reg Guides, SERs, and regulatory correspondence. Discuss and ensure proper understanding of design and licensing basis requirements and where they are located. Involve Design Bases Group in design change.
☒ Yes ☐ No 9	Are multiple parties involved such that errors may be introduced via communication channels?	Establish expectations where needed. Determine methods. Avoid Email as sole communication method. Emphasize written documentation and/or communication for critical information. Clarify how scope, progress, results and consequences will be communicated before, during and after the task. • **ACECO and WGInt**

☐ ☒ Yes No 10	Is this a Station first-time action, configuration change or process?	Perform pre-implementation and post-implementation walk downs. Validate new and revised testing, operational and maintenance procedures. Establish hold points and/or monitoring plan. Use a simulator or mock-up. Consider an ITPR.
☐ ☒ Yes No 11	Will the design change or process result in operation outside of industry operating experience?	Consider an ITPR. Consider different solution.
☐ ☒ Yes No 12	Could the design change create an interim or final condition where a unit trip or isolation could occur with a single input?	Utilize operating experience. Investigate alternative processes or products. Refer to Consider an ITPR.
☐ ☒ Yes No 13	Other process risk factor not listed	Choose appropriate tool, barrier, or action and list on briefing sheet.

Prepared by: W. J. Parker Date: 8/19/2008

ATTACHMENT 5

PROCEDURES AND STANDARDS

The following procedures and standards were used in the development of PC/M 07-047:

1. FPL Specification: SPEC-C-004: Protective Coatings for Areas Outside the Reactor Containment
2. FPL Specification SPEC-C-091: Turkey Point Units 3 and 4 Fuel Cask Crane Upgrade - Architect/Engineer Scope of Work
3. FPL Specification SPEC-C-099: Fabrication of Structural and Miscellaneous Steel
4. FPL Specification SPEC-C-101: PTN Cask Crane Upgrade - Steel Work and Miscellaneous Activities Construction Bid Specification
5. FPL Specifications CN-2.9 and CN-2.11: Concrete Specifications
6. FPL Procedure 0-ADM-217: Conduct of Infrequently Performed Tests or Evolutions
7. FPL Procedure 0-ADM-717: Heavy Load Handling
8. FPL Procedure 0-ADM-726: Rigging Operations
9. FPL Procedure 0-GMM-102.18: Implementation Procedure for Heavy Hauls
10. Washington Group Calculations FPL001-CALC-001: Supporting Crane Structure Seismic and Wind Load Analysis
11. Washington Group Calculations FPL001-CALC-002:Design of Foundations and Steel Structure Support Connections
12. Washington Group Calculations FPL001-CALC-003: Stability Analysis During Installation
13. Washington Group Specification SPEC-WGInt-C-001: Design Criteria Document
14. Washington Group Report No. 29142-01; Cask Crane Support Structure Inspection Report
15. Washington Group Report No. PTN-ENG-SECJ-08-025, Support Structure Dedication Report
16. Washington Group Report No. PTN-ENG-SECS08-035, Underground Utilities Evaluation for Cask Crane Support Structure.
17. NUREG-0554: Single Failure-Proof Cranes for Nuclear Power Plants
18. NUREG-0612: Heavy Load Handling in Operating Nuclear Power Plant
19. ASME-NOG-1: Rules for Construction of Overhead Cranes

Prepared by: W. J. Parker Date: 8/19/2008

ATTACHMENT 4
(Page 1 of 2)
ENGINEERING MODIFICATIONS

Observer Name: W.J. PARKER
Date: 8/15/08
Observation Duration: 2 Hrs. 0 Min.
Modification Type: EP
Modification Number: 07-047
Safety Classification: SR
Lead Discipline: CIVIL
Modification Source Document: CAR05-106

E = Excellent M = Meets U = Unsatisfactory N/A = Not Applicable
Note: Coaching is required for all Excellent and Unsatisfactory conditions.

U	1. Personnel training and qualifications adequate.
M	2. Purpose of engineering document is clearly stated/document type correct
M	3. Appropriate licensing and design basis information is identified/used
M	4. Reason for change justified
M	5. Impact of change evaluated/justified
M	6. Design basis/FSAR/Technical Specification/EOP impact evaluated
M	7. Modification meets needs of requestor (CAR, CR, etc)
M	8. 50.59 Evaluation/Screening adequate
M	9. ALARA/Fire protection screening appropriate
M	10. Appropriate reviews and approvals completed
M	11. Walkdown with affected departments completed
M	12. Operating experience reviewed, as appropriate
NA	13. Affected PODs/documents/software identified and marked up as appropriate
M	14. Affected drawings reviewed by verifier. Validate all changes meet design intent.
M	15. Review of ENG QI 1.8 and ENG QI Form 3 Design Change Checklist completed
M	16. Material Procurement Classifications consistent with Safety Classification and Stock Code
NA	17. Spare parts/inventory changes identified
M	18. Clarity of implementation instructions
NA	19. Electrical/I&C pre-implementation drawings ("before") and implementor verification statement included
NA	20. New maintenance recommendations or PM's identified
NA	21. Post maintenance testing identified and appropriate to confirm critical characteristics and functions are verified to work properly
M	22. Comments from all affected departments obtained and resolved
M	23. Review meetings completed and documented
M	24. Aspects of impact on human factors evaluated, as appropriate
M	25. Independent verification/reviews adequate, if applicable
M	26. PNSC review completed, as required SCHEDULED

☒ Observation discussed with preparer(s)/reviewer(s)
WGINT (AIE) INFORMED OF PERFORMANCE

ATTACHMENT 4
(Page 2 of 2)
ENGINEERING MODIFICATIONS

Attribute Comments: (Use this field to list comments specific to each Excellent or Unsatisfactory observation. List Attribute, Comment, and Reason "Why" for any Unsatisfactory Observation.)

Attribute ID	Comment	Reason "Why"
1	TRAINING/QUALIFICATION LESS THAN ADEQUATE	UNSAT WAS ADDRESSED IN EDI-006 RISK ASSESSMENT - RISK FACTOR #2.

General Comments: (Additional strengths, deficiencies, and / or latent conditions that challenge human performance)

A/E HAD VIFFICULTY UNDERSTANDING AND MEETING FPL PC/M REQUIREMENTS. FPL COACHING AND REVIEW EFFORT-HIGH.

W J Parker 8/15/08

FPL

FSP-07-123

To: J. E. Hamm

Date: August 20, 2008

From: M. F. Moran

Department: NPE/JB

Subject: Turkey Point Plant Units 3 & 4
Engineering Package (EP)
Cask Crane Upgrade Project
Support Structure Upgrade, PC/M 07-047, Revision 0

Attached please find the final Engineering Package PC/M 07-047, Revision 0, for Plant Nuclear Safety Committee review and approval. This PC/M provides the support structural design for the cask crane upgrade needed to support the Turkey Point Plant ISFSI. The design of this modification will require a Revision 1 to this package.

A PTN Design Review Board was held on July 17, 2008, with the required quorum members and a number of non-quorum members attending; meeting minutes and the status of DRB actions are attached, with PC/M Comment Sheets. An Implementation Review meeting was conducted on July 31, 2008, with the required stakeholders and a number of non-stakeholders attending; signed PC/M Comment Sheets from the required PTN key stakeholders, other plant stakeholders and the Juno Beach Nuclear Project Engineering Group are attached. The required EDI-006, Design Change Pre-Job Brief and Risk and Consequences Assessment has been completed for this Modification and is attached. The required EDI-ENG-013, Engineering Human Performance Review has been completed for this Modification and is attached.

If you have any questions on this matter, please contact Walt Parker at 694-3878 in Juno Beach.

Action Summary

Distribute the attached PC/M 07-047, Revision 0 for Plant Nuclear Safety Committee (PNSC) review and approval; request PNSC target of September 3, 2008 for purposes of scheduling participants.

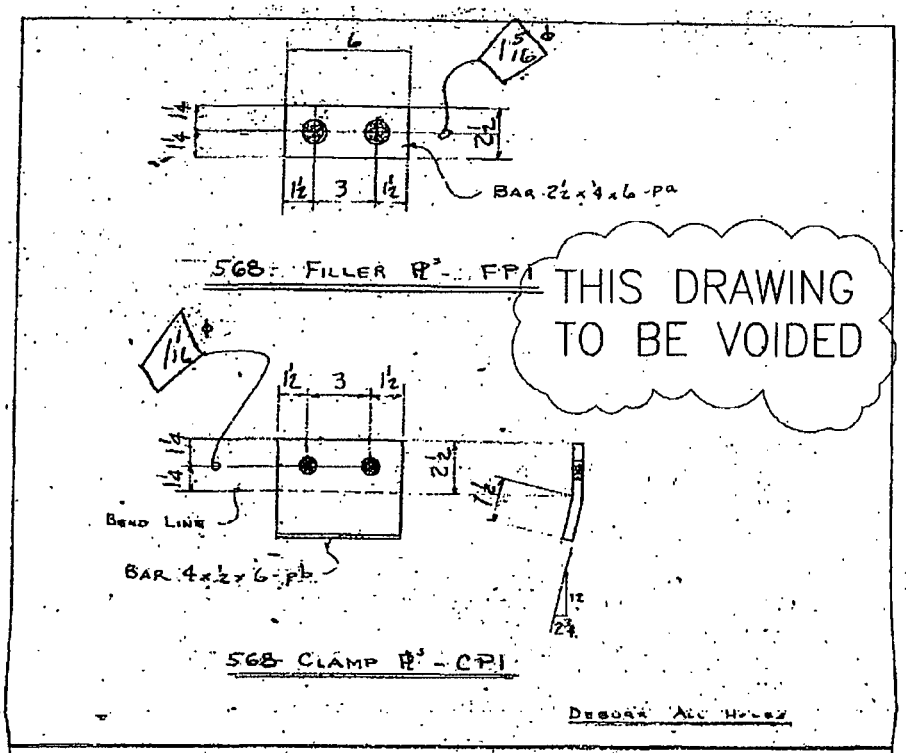
M. F. Moran FOR

MFM/wjp/ro

Attachments: PC/M Cover Sheet, Form F-148 For PC/M 07-047, Rev. 0
PTN Design Review Board Minutes & Action Responses, dated 8/15/2008
Signed PTN Key Stakeholders and JB NPE PC/M Comment/Resolution Sheets
EDI-006, Design Change Pre-Job Brief and Risk and Consequences Assessment for PC/M 07-047
Completed EDI-ENG-013, Engineering Human Performance Review for PC/M 07-047
Engineering Package (EP) PC/M 07-047, Rev. 0, w/13 Attachments/48 Drawings

cc:

E. Lora (w/Att.)	G. Hollinger	A. Zielonka	V. Ursitti
S. Chaviano	G. Circosta	W. Parker	D. Golino (WGInt)
S. Boling	W. Jenkins	D. Meade	J. Warren (WGInt)
G. Circosta	S. Cousino	M. Strouse	



SHIPPING LIST / MATERIAL BILL

SHIP NO.	NO. PCS.	DESCRIPTION	MARK	WT.	NO. PCS.	DESCRIPTION	LENGTH FT.	LENGTH IN.	MARK	REMARKS	WT.	CUT FROM
		568 FILLER PL	FP1		1	568 BAR 2½ x ¼ -	6		PB			
		568 CLAMP PL	CP1		3	568 BAR 4 x ½ -	6		PB			

VENDOR'S DRAWING REVIEW

SEE REV 2 C-23-597-1

FILE: 5610-C-23-597-1

FLORIDA STEEL CORPORATION
"Steel When You Want It"

DRAWN JT-F.D. DATE 11/17
CHK'D GRH DATE 11/17/67

NO.	REVISIONS	DATE
1		

PRINTS 5 DATE 6-15-68
APPR
CONTR
SHOP

STRUCTURE FLA. POWER & LIGHT
UNIT #4 TURKEY POINT
LOCATION FLORIDA CITY FLA.
CUSTOMER BECHTEL CORP.
ARCHT. OR ENGR SAME
DESCRIPTION CRANE RAIL CLAMPS

SHOP CODING
HOLES NOTED
PAINT CARBO ZINC #11
JOB NO. 166-0140
DWG. NO. SK6
BILL PAGE 6 OF

FORM NO. 902000 SH 2-63

67-81860-F

NOTE: THIS DWG IS MADE FROM:
(VENDOR) DWG. NO.
(A/E) DWG. NO. REV
FPL DWG. NO. 5610-C-23-597 REV 1

FPL

TURKEY POINT NUCLEAR UNITS 3&4

MISC. CIVIL DETAILS

CRANE RAIL CLAMPS

FLORIDA POWER & LIGHT

DWG NO 5610-C-23-597/07-047

SYS —

REV 0

REV	DATE	REVISION	BY	CH	APP	APP
0	8/20/08	ISSUED FOR USE PCM 07-047	JW	DP		EO

8 1/2 X 11 A SIZE 04/08/94

5610-C-23-597 PCM.DWG

PCM Drawing No.	Rev.	Description/Title	Disc.	Affected Plant Drawings	Rev.	Priority	EP Rev
5610-C-1921 Sht 3/07-047 *	0	Framing Plan Bent 1 - E1903	C	5610-C-1921 Sht 3	0	N/A	2
5610-C-1921 Sht 4/07-047	0	Framing Plan Bent 6 - E1903A	C	5610-C-1921 Sht 4	0	N/A	2
5610-C-1921 Sht 5/07-047 *	0	Framing Plan Bent 2 - E1904	C	5610-C-1921 Sht 5	0	N/A	2
5610-C-1921 Sht 6/07-047 *	0	Framing Plan Bent 3 - E1904A	C	5610-C-1921 Sht 6	0	N/A	2
5610-C-1921 Sht 7/07-047 *	0	Framing Plan Bent 4 - E1904B	C	5610-C-1921 Sht 7	0	N/A	2
5610-C-1921 Sht 8/07-047	0	Framing Plan Bent 5 - E1904C	C	5610-C-1921 Sht 8	0	N/A	2
5610-C-1921 Sht 9/07-047	0	Framing Plan Bent 2.7 - E1905	C	5610-C-1921 Sht 9	0	N/A	2
5610-C-1921 Sht 10/07-047	0	Framing Plan Bent 3.6 - E1906	C	5610-C-1921 Sht 10	0	N/A	2
5610-C-1921 Sht 11/07-047	0	Framing Plan Bent 4.4 - E1907	C	5610-C-1921 Sht 11	0	N/A	2
5610-C-1921 Sht 12/07-047	0	Framing Plan Bents 1.1, 1.9, 5.2, 6.1 – E1908	C	5610-C-1921 Sht 12	0	N/A	2
5610-C-1921 Sht 13/07-047	0	Framing Plan Elevation 94' – 6" – E1909	C	5610-C-1921 Sht 13	0	N/A	2
5610-C-1921 Sht 14/07-047	0	East Truss - E1909A	C	5610-C-1921 Sht 14	0	N/A	2
5610-C-1921 Sht 15/07-047	0	West Truss - E1909B	C	5610-C-1921 Sht 15	0	N/A	2
5610-C-1921 Sht 16/07-047	0	Crane Rail Layout Elevation 94' – 6" – E1910	C	5610-C-1921 Sht 16	0	N/A	2
5610-C-1921 Sht 17/07-047	0	Full Elevation Line A (Bents 3 – 6) – E1911	C	5610-C-1921 Sht 17	0	N/A	2
5610-C-1921 Sht 18/07-047	0	Full Elevation Line A (Bents 1 – 3) – E1911A	C	5610-C-1921 Sht 18	0	N/A	2
5610-C-1921 Sht 19/07-047	0	Part Elevation Line A (Bents 1 – 6) – E1911B	C	5610-C-1921 Sht 19	0	N/A	2
5610-C-1921 Sht 20/07-047	0	Splices and Connections – E1911C	C	5610-C-1921 Sht 20	0	N/A	2
5610-C-1921 Sht 21/07-047	0	Framing Plan SFB Roof U4 – E1912	C	5610-C-1921 Sht 21	0	N/A	2
5610-C-1921 Sht 22/07-047	0	Framing Plan SFB Roof U3 – E1913	C	5610-C-1921 Sht 22	0	N/A	2

C-12514
C-12466
C-12443
C-12568

* Previously issued under CRN's C-12514, C-12466, C-12443, C-12568 respectively. All drawings issued by this revision of the PC/M supercede the drawings previously issued by the CRNs mentioned above.

Florida Power and Light, 700 Universe Blvd., Juno Beach, FL 33408

Letter No.: NP-ISFSI-09-2461

November 3, 2009

Subject: PC/M 07-047 Revision 2
Turkey Point Cask Crane - Support Structure Upgrade

To: File

PC/M revision 2 incorporates the vendor approved erection drawings. The inclusion of these drawings into the PC/M facilitates the construction effort and provides approved connection design details.
This revision does not affect in any manner the existing design or the existing design drawings, nor is there an impact to the 10 CFR 50.59 Applicability Determination/ Screening. As a result, the Site Engineering Manager concurs with waiving the Implementation Review and meeting as referenced in ENG-QI 1.1.

Sincerely,

Wyatt Jenkins
Project Manager

cc:

FPL:	G. Hollinger	S. Cousino	D. Meade	M. Strouse	V. Ursitti
	A. Doxey	C. Malone	M. Mowbray	C. Gears	S. Boling

Campbell, Melba

From: Chaviano, Sergio
Sent: Thursday, November 19, 2009 2:40 PM
To: Campbell, Melba
Subject: Re: PCM 07-047 - meeting waiver

Ok to waive meetings. Rev is administrative.
Sent from my Blackberry Wireless handheld.

From: Campbell, Melba
To: Chaviano, Sergio
Sent: Thu Nov 19 12:38:04 2009
Subject: PCM 07-047 - meeting waiver

Sergio,
This PCM was routed to PNSC by the originator, Conf. didn't see it. I don't see your name on this letter to waive the review meeting. Were you aware of it?
Thanks,
Melba

PC/M COMMENT SHEET

PC/M: 07-047 Rev. No.: 2 Unit No.: 3 & 4 Due Date:

Title: PC/M 07-047 Turkey Point Cask Crane – Support Structure Upgrade

Name of Reviewer: _____ Department: ENG

I have reviewed the subject PC/M and: (check all that apply)

- ☒ Have no comments.
- ☐ Have the following comments. Additional comments on page(s)
- ☐ Have determined no procedures are affected for my department.
- ☐ Have determined procedures are affected and have listed them.
- ☐ A system functional test is not required.
- ☐ A system functional test is required.
- ☐ The modifications do not affect my department. Configuration control may sign the System Acceptance Turnover Sheet for my department. (Initial)

Signed: _____ Date: 11/20/07

COMMENTS

FOR PREVENTIVE MAINTENANCE ONLY

- ☐ Maintenance has reviewed this PC/M and determined that no PM activity is required.
- ☐ Maintenance will evaluate the proposed modification and establish a minimum PM activity.

COMMENT RESOLUTION

I have reviewed and concur with the comment resolutions.		Resolution prepared by:	
Signed:		Signed:	
Print:	Date:	Print:	Date:

PC/M COMMENT SHEET

PC/M: 07-047 Rev. No.: 2 Unit No.: 3 & 4 Due Date:

Title: PC/M 07-047 Turkey Point Cask Crane – Support Structure Upgrade

Name of Reviewer: R. O'DONNELL Department: NPS/MAINT/IMPLEMENTATION

I have reviewed the subject PC/M and: (check all that apply)

- ☒ Have no comments.
- ☐ Have the following comments. Additional comments on page(s)
- ☐ Have determined no procedures are affected for my department.
- ☐ Have determined procedures are affected and have listed them.
- ☐ A system functional test is not required.
- ☐ A system functional test is required.
- ☐ The modifications do not affect my department. Configuration control may sign the System Acceptance Turnover Sheet for my department. (initial)

FOR PREVENTIVE MAINTENANCE ONLY

- ☐ Maintenance has reviewed this PC/M and determined that no PM activity is required.
- ☐ Maintenance will evaluate the proposed modification and establish a minimum PM activity.

Signed: Date:

COMMENTS	COMMENT RESOLUTION

I have reviewed and concur with the comment resolutions.

Signed: R. O'Donnell 12-18-09

Print: Date:

Resolution prepared by:

Signed:

Print: Date:

PC/M COMMENT SHEET

PC/M: 07-047 Rev. No.: 2 Unit No.: 3 & 4 Due Date:

Title: PC/M 07-047 Turkey Point Cask Crane – Support Structure Upgrade

Name of Reviewer: SEAN FLETCHER Department: SECURITY

I have reviewed the subject PC/M and: (check all that apply)

- ☒ Have no comments.
- ☐ Have the following comments. Additional comments on page(s)
- ☐ Have determined no procedures are affected for my department.
- ☐ Have determined procedures are affected and have listed them.
- ☐ A system functional test is not required.
- ☐ A system functional test is required.
- ☐ The modifications do not affect my department. Configuration control may sign the System Acceptance Turnover Sheet for my department. (Initial)

Signed: Sean Fletcher Date: 11/18/09

FOR PREVENTIVE MAINTENANCE ONLY

- ☐ Maintenance has reviewed this PC/M and determined that no PM activity is required.
- ☐ Maintenance will evaluate the proposed modification and establish a minimum PM activity.

COMMENTS

COMMENT RESOLUTION

I have reviewed and concur with the comment resolutions.		Resolution prepared by:	
Signed:		Signed:	
Print:	Date:	Print:	Date:

PC/M COMMENT SHEET

PC/M: 07-047 Rev. No.: 2 Unit No.: 3 & 4 Due Date:

Title: PC/M 07-047 Turkey Point Cask Crane – Support Structure Upgrade

Name of Reviewer: D. Meade for R. Pearson 11/13/07 Department: OPS

I have reviewed the subject PC/M and: (check all that apply)

- ☒ Have no comments.
- ☐ Have the following comments. Additional comments on page(s)
- ☐ Have determined no procedures are affected for my department.
- ☐ Have determined procedures are affected and have listed them.
- ☐ A system functional test is not required.
- ☐ A system functional test is required.
- ☐ The modifications do not affect my department. Configuration control may sign the System Acceptance Turnover Sheet for my department. (initial)

FOR PREVENTIVE MAINTENANCE ONLY

- ☐ Maintenance has reviewed this PC/M and determined that no PM activity is required.
- ☐ Maintenance will evaluate the proposed modification and establish a minimum PM activity.

Signed: Date:

COMMENTS	COMMENT RESOLUTION
No comments reference attached email.	

I have reviewed and concur with the comment resolutions.	Resolution prepared by:
Signed:	Signed:
Print: Date:	Print: Date:

Meade, Doran

From: Pearson, Richards
Sent: Friday, November 13, 2009 10:51 AM
To: Meade, Doran
Subject: PC/M 07-047

Doran,

I have looked at the paperwork you left me for this PC/M. As an OPS guy by trade, I don't see anything I can comment on. Looks like all structurally related components for the cask crane. I think you can have Rich Wright sign-off on this.

Rick Pearson
Operations Support
305-246-3763

PC/M COMMENT SHEET

PC/M: 07-047 Rev. No.: 2 Unit No.: 3 & 4 Due Date:

Title: PC/M 07-047 Turkey Point Cask Crane – Support Structure Upgrade

Name of Reviewer: William D. Bracey Department: Planning

I have reviewed the subject PC/M and: (check all that apply)

- ☒ Have no comments.
- ☐ Have the following comments. Additional comments on page(s)
- ☐ Have determined no procedures are affected for my department.
- ☐ Have determined procedures are affected and have listed them.
- ☐ A system functional test is not required.
- ☐ A system functional test is required.
- ☐ The modifications do not affect my department. Configuration control may sign the System Acceptance Turnover Sheet for my department. (Initial)

FOR PREVENTIVE MAINTENANCE ONLY

- ☐ Maintenance has reviewed this PC/M and determined that no PM activity is required.
- ☐ Maintenance will evaluate the proposed modification and establish a minimum PM activity.

Signed: W. D. Bracey Date: 11/18/09

COMMENTS

COMMENT RESOLUTION

I have reviewed and concur with the comment resolutions.		Resolution prepared by:	
Signed:		Signed:	
Print:	Date:	Print:	Date:

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
License Amendment Request No. 202
Response to Request for Additional Information

Enclosure
Attachment 2

Site Functional Test Procedure
REP-20872-013, Revision 2

AMERICAN CRANE
& EQUIPMENT CORPORATION
531 Old Swede Road, Douglassville, PA 19518
Phone 610-385-6061 Fax 610-385-1022

SITE FUNCTIONAL TEST PROCEDURE

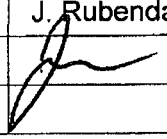
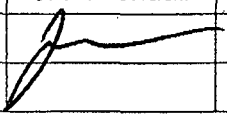
FOR

130/25T SFP CASK CRANE
TURKEY POINT NUCLEAR PLANT UNITS 3 AND 4
FLORIDA POWER & LIGHT COMPANY
CUSTOMER P.O. NO.: 00099932

BY

AMERICAN CRANE & EQUIPMENT CORPORATION
ACECO WORK ORDER NO.: 20872

SIGNATURES

REV.	ORIGINATED	DATE	CHECKED	DATE	APPROVED	DATE
0	K. Bower	09/28/09	J. Rubendall	11/11/09	J. Rubendall	11/11/09
1	K. Bower	03/25/10	J. Rubendall	03/25/10	J. Rubendall	03/25/10
2	K. Bower	08/03/10		8/4/10		8/4/10

REVISION HISTORY

REVISION	SECTION	SUMMARY
1	Various	Revised per customer comment- reference document change bars at right page margin.
2	Various	Revised per customer comment- reference document change bars at right page margin.

TABLE OF CONTENTS

TEST PARTICIPANTS

ACECO Test Conductor-

Name (Print): _____
Signature: _____
Initials: _____
Date: _____

Customer Representative-

Name (Print): _____
Signature: _____
Initials: _____
Date: _____

Others-

Name (Print): _____
Company / Title: _____
Signature: _____
Date: _____

Name (Print): _____
Company / Title: _____
Signature: _____
Date: _____

Name (Print): _____
Company / Title: _____
Signature: _____
Date: _____

Name (Print): _____
Company / Title: _____
Signature: _____
Date: _____

I. General Information

A. Description

This document is to be used in the performance and documentation of the site functional acceptance test for the new Cask Crane supplied by American Crane and Equipment Corporation (ACECO) to the Turkey Point Nuclear Plant (PTN), operated by Florida Power & Light Company (FPL). This functional test was developed in accordance with the requirements of FPL Specification No. SPEC-C-063 "Turkey Point Units 3 and 4 Fuel Cask Crane Upgrade", NUREG-0554 "Single-Failure Proof Cranes for Nuclear Power Plants", and ASME NOG-1-2004 "Rules for Construction of Overhead and Gantry Cranes". The steps of the functional test do not need to be performed in the same order as they are written. Any problems encountered during the performance of the test that cannot be resolved through procedure mark-ups or comments should be recorded on the discrepancy record sheet found at the end of this document. If possible, the test conductor and customer representative should also agree to and document the resolution to the issue on the discrepancy record sheet. All test discrepancies must be resolved before the procedure is signed off as complete unless separately tracked for closure in an ACECO Nonconformance Report and FPL Action Request / Condition Report. |

B. Test Participant Responsibilities

1. ACECO Test Conductor- This person will represent American Crane and Equipment Corporation during the performance of this test. Along with the customer representative, this person will direct the performance of the test and will check off and initial each step as it is completed.

2. Customer Representative- This person will represent the buyer of the equipment and should have the authority to oversee and approve the results of the site acceptance test. This person, at his discretion, may check off and initial each step of the test as it is completed, but is required to sign at the conclusion of the test procedure to acknowledge successful completion of the test. The signature of this person after completion of the procedure will indicate that the equipment has demonstrated adequate performance and is acceptable for use.

3. Others- These people may be ACECO or customer representatives or quality assurance personnel involved in the performance of the test or observing the test to ensure that the proper procedures and documentation steps are followed. The customer representative or ACECO test conductor may include the approval signatures of these people at their discretion.

C. Required Equipment

1. 100' and 25' tape measures to be used for travel distance measurements to obtain motion speed.

2. A stopwatch to measure travel duration in order to determine motion speed. (Provided by FPL- record instrument data in the table on the next page.)

4. A digital voltmeter (DVM) suitable for measuring voltage levels up to 480VAC. (Provided by FPL- record instrument data in the table on the next page.)

5. A digital clamp-on ammeter (Amprobe) suitable for measuring 3-phase amperage up to 50 amps. (Provided by FPL- record instrument data in the table on the next page.)

6. The latest revision of the electrical drawings and material list. (Note: Reference ACECO drawing D-20872-0800 for a listing of the acronyms included in this procedure.)

MEASURING AND TEST EQUIPMENT RECORD TABLE

Instrument Description	Instrument Control Number	Calibration Due Date	Procedure Step(s) Used

D. General Work Practices

1. The ACECO Test Conductor and any applicable FPL personnel will conduct a work and safety briefing prior to the start of testing each day with all personnel involved with the testing on that day.

2. FPL shall provide all required fall prevention or arrest devices that must be used when it is necessary to perform tasks in areas where the potential drop distance is greater than 6'.

3. The hazardous area below the crane should be cordoned off with caution tape and the crane inspected for any loose materials or other potential personnel safety hazards prior to the start of testing each day.

4. All ACECO and contract workers must follow the specific safety guidelines imposed by FPL procedures and personnel responsible for site industrial safety.

5. All personnel involved with crane testing must have completed the applicable site worker training program(s). The exact training requirements for a particular individual shall be established by FPL prior to the individual's arrival on site.

6. Personnel required to work inside energized electrical enclosures or near exposed, high-voltage components shall obtain necessary FPL electrical qualifications. Wire lifts and re-terminations required by the test procedure shall be performed only after all control power has been removed by placing the Main Disconnect Switch (MDS) in the OFF position. |

7. FPL operations personnel shall be notified before the crane is energized each day to begin performing the test procedure.

8. The FPL Lifted Leads Data Sheet attached to the work order shall be used to document any removal of wires or installation of jumpers required by this test procedure. |

II. Equipment Inspections

Note: The following inspections may be completed by ACECO prior to the powered functional testing to be witnessed by FPL personnel. Step verification may be performed by the customer at their discretion.

A. General

1. Spot check electrical terminations for tightness and proper installation of crimp-on terminals. Ensure that wire and terminal block markings match and are legible.

( ) COMPLETED INITIALS: _____

2. Verify that components have not been installed in positions that will cause interference with other crane or building structures when the trolley or bridge is operated.

( ) COMPLETED INITIALS: _____

3. Ensure that any energized components have appropriate protective guards installed to prevent inadvertent personnel contact.

( ) COMPLETED INITIALS: _____

4. Verify proper oil levels in all gearboxes, as applicable.

( ) COMPLETED INITIALS: _____

5. Verify the proper fluid level in the drum brake hydraulic power unit.

( ) COMPLETED INITIALS: _____

6. Ensure all bearings and couplings have been greased, as applicable.

( ) COMPLETED INITIALS: _____

7. Inspect painted and unpainted surfaces for damage or corrosion.

( ) COMPLETED INITIALS: _____

8. Inspect all bridge and trolley mounted machinery for damage and fluid leaks.

( ) COMPLETED INITIALS: _____

III. Functional Test

A. Control Mode Select and Main Contactor Control- Cab

1. Index the control mode select keyswitch (KSW1) to the CAB position and the push-to-stop pushbutton (PB2) to the raised position. Press the power-on pushbutton (PB1) and observe that the main contactor (M) is energized and the power-on pilot light (PL1) and beacon (BCN1) are lit. Press the push-to-stop pushbutton and verify that the main contactor is de-energized and the pilot light and beacon are off.

   ( ) COMPLETED INITIALS: _____

2. Index the push-to-stop pushbutton (PB2) to the raised position and the control mode select keyswitch (KSW1) to the RADIO position. Ensure that the main contactor (M) cannot be energized by pressing the power-on pushbutton (PB1) and then return the keyswitch to the CAB position.

   ( ) COMPLETED INITIALS: _____

3. Verify that the warning horn (HORN) sounds when the warning horn pushbutton (PB3) is pressed.

   ( ) COMPLETED INITIALS: _____

4. With the push-to-stop pushbutton (PB2) in the raised position, verify that the main contactor (M) cannot be energized by pressing the power-on pushbutton (PB1) with any of the control joysticks (HJS, AHJS, TJS, BJS) moved from the centered, neutral position. Repeat the test with each individual joystick moved in both respective directions of motion.

   ( ) COMPLETED INITIALS: _____

5. Switch the power monitor relay circuit breaker (PMCB) off. With the push-to-stop pushbutton (PB2) in the raised position, verify that the main contactor (M) cannot be energized when the power monitor relay (PMR) is detecting a loss of power condition. Switch the circuit breaker on and confirm that the main contactor can be energized by pressing the power-on pushbutton (PB1).

   ( ) COMPLETED INITIALS: _____

6. Verify that all pilot and beacon lights are energized when the light test pushbutton (PB5) is pressed.

( ) COMPLETED INITIALS: _____

7. Clear the fault history data on all AFDs before starting motion testing.

( ) COMPLETED INITIALS: _____

B. Main Hoist Control- Cab

1. With the main hoist critical load selector switch (SS2) indexed to the CRIT position, slowly push the main hoist control joystick (HJS) forward and observe that the main hoist operates in the lowering direction at an increasing rate of speed. Observe the main hoist frequency drive (HAFD) display to ensure that the maximum output frequency is 60 Hz. Verify that the main hoist lowering motion pilot light (PL26) is illuminated when the drum is turning.

( ) COMPLETED INITIALS: _____

2. With the main hoist critical load selector switch (SS2) indexed to the CRIT position, slowly pull the main hoist control joystick (HJS) back and observe that the main hoist operates in the raising direction at an increasing rate of speed. Observe the main hoist frequency drive (HAFD) display to ensure that the maximum output frequency is 60 Hz. Verify that the main hoist raising motion pilot light (PL25) is illuminated when the drum is turning.

( ) COMPLETED INITIALS: _____

3. Index the main hoist critical load selector switch (SS2) to the NORM position. Operate the hoist in each direction and observe the main hoist frequency drive (HAFD) display to ensure that the maximum output frequency is 90 Hz.

( ) COMPLETED INITIALS: _____

4. Press and release the toggle pushbutton on the top of the main hoist control joystick (HJS) to enable micro-speed control. Operate the hoist in each direction and observe the main hoist frequency drive (HAFD) display to ensure that the maximum output frequency is 6 Hz. Press and release the joystick toggle pushbutton to disable micro-speed control.

( ) COMPLETED INITIALS: _____

C. Aux Hoist Control- Cab

1. With the aux hoist critical load selector switch (SS3) indexed to the CRIT position, slowly push the aux hoist control joystick (AHJS) forward and observe that the aux hoist operates in the lowering direction at an increasing rate of speed. Observe the aux hoist frequency drive (AHAFD) display to ensure that the maximum output frequency is 60 Hz. Verify that the aux hoist lowering motion pilot light (PL28) is illuminated when the drum is turning.

   ( ) COMPLETED INITIALS: _____

2. With the aux hoist critical load selector switch (SS3) indexed to the CRIT position, slowly pull the aux hoist control joystick (AHJS) back and observe that the aux hoist operates in the raising direction at an increasing rate of speed. Observe the aux hoist frequency drive (AHAFD) display to ensure that the maximum output frequency is 60 Hz. Verify that the aux hoist raising motion pilot light (PL27) is illuminated when the drum is turning.

   ( ) COMPLETED INITIALS: _____

3. Index the aux hoist critical load selector switch (SS3) to the NORM position. Operate the hoist in each direction and observe the aux hoist frequency drive (AHAFD) display to ensure that the maximum output frequency is 90 Hz.

   ( ) COMPLETED INITIALS: _____

4. Press and release the toggle pushbutton on the top of the aux hoist control joystick (AHJS) to enable micro-speed control. Operate the hoist in each direction and observe the aux hoist frequency drive (AHAFD) display to ensure that the maximum output frequency is 6 Hz. Press and release the joystick toggle pushbutton to disable micro-speed control.

   ( ) COMPLETED INITIALS: _____

D. Trolley Control- Cab

1. Slowly push the trolley control joystick (TJS) forward and observe that the trolley operates in the west direction at an increasing rate of speed. Observe the trolley frequency drive (TAFD) display to ensure that the maximum output frequency is 60 Hz. Verify that the motion warning tone is sounded by the horn (HORN) when the trolley is moving.

   ( ) COMPLETED INITIALS: _____

2. Slowly pull the trolley control joystick (TJS) back and observe that the trolley operates in the east direction at an increasing rate of speed. Observe the trolley frequency drive (TAFD) display to ensure that the maximum output frequency is 60 Hz. Verify that the motion warning tone is sounded by the horn (HORN) when the trolley is moving.

   ( ) COMPLETED INITIALS: _____

3. Press and release the toggle pushbutton on the top of the trolley control joystick (TJS) to enable micro-speed control. Operate the trolley in each direction and observe the trolley frequency drive (TAFD) display to ensure that the maximum output frequency is 15 Hz. Press and release the joystick toggle pushbutton to disable micro-speed control.

   ( ) COMPLETED INITIALS: _____

4. Index the single motion control selector switch (SS4) to the SINGLE position. Operate the main hoist in either direction and then attempt to operate the trolley. Verify that trolley operation in both directions is disabled when the main hoist motor is energized (including load float time). Index the single motion control selector switch back to the NORM position and confirm that simultaneous main hoist and trolley operation is possible.

   ( ) COMPLETED INITIALS: _____

E. Bridge Control- Cab

1. Slowly move the bridge control joystick (BJS) to the right and observe that the bridge operates in the north direction at an increasing rate of speed. Observe the bridge frequency drive (BAFD) display to ensure that the maximum output frequency is 60 Hz. Verify that the motion warning tone is sounded by the horn (HORN) when the bridge is operating.

   ( ) COMPLETED INITIALS: _____

2. Slowly move the bridge control joystick (BJS) to the left and observe that the bridge operates in the south direction at an increasing rate of speed. Observe the bridge frequency drive (BAFD) display to ensure that the maximum output frequency is 60 Hz. Verify that the motion warning tone is sounded by the horn (HORN) when the bridge is operating.

   ( ) COMPLETED INITIALS: _____

3. Press and release the toggle pushbutton on the top of the bridge control joystick (BJS) to enable micro-speed control. Operate the bridge in each direction and observe the bridge frequency drive (BAFD) display to ensure that the maximum output frequency is 15 Hz. Press and release the joystick toggle pushbutton to disable micro-speed control.

   ( ) COMPLETED INITIALS: _____

4. Index the single motion control selector switch (SS4) to the SINGLE position. Operate the main hoist in either direction and then attempt to operate the bridge. Verify that bridge operation in both directions is disabled when the main hoist motor is energized (including load float time). Index the single motion control selector switch back to the NORM position and confirm that simultaneous main hoist and bridge operation is possible.

   ( ) COMPLETED INITIALS: _____

F. Main Contactor Control- Radio

1. Index the control mode select keyswitch (KSW1) to the RADIO position and the push-to-stop pushbutton (PB2) to the raised position. Rotate the radio transmitter enable keyswitch to ON and then index the power toggle switch to the ON position. Observe that the main contactor (M) is energized and the power-on pilot light (PL1) and beacon (BCN1) are lit. Index the radio transmitter power toggle switch to OFF and verify that the main contactor is de-energized and the pilot light and beacon are off.

( ) COMPLETED INITIALS: _____

2. Press the push-to-stop pushbutton (PB2) and verify that the main contactor (M) cannot be energized from the radio transmitter. Index the push-to-stop pushbutton back to the raised position. Position the control mode select keyswitch (KSW1) in the CAB position and ensure that the main contactor cannot be energized from the radio transmitter. Return the keyswitch to the RADIO position. Rotate the radio transmitter enable keyswitch to ON and then index the power toggle switch to the ON position. Observe that the main contactor (M) is energized.

( ) COMPLETED INITIALS: _____

3. Verify that the warning horn (HORN) sounds whenever the horn pushbutton on the radio transmitter is pressed.

( ) COMPLETED INITIALS: _____

G. Main Hoist Control- Radio

1. With the main hoist critical load toggle switch indexed to the CRIT position, slowly push the main hoist control lever forward and observe that the hoist operates in the lowering direction at an increasing rate of speed. Observe the main hoist frequency drive (HAFD) display to ensure that the maximum output frequency is 60 Hz.

   ( ) COMPLETED INITIALS: _____

2. With the main hoist critical load toggle switch indexed to the CRIT position, slowly pull the main hoist control lever back and observe that the hoist operates in the raising direction at an increasing rate of speed. Observe the main hoist frequency drive (HAFD) display to ensure that the maximum output frequency is 60 Hz.

   ( ) COMPLETED INITIALS: _____

3. Index the main hoist critical load toggle switch to the NORM position. Operate the hoist in each direction and observe the main hoist frequency drive (HAFD) display to ensure that the maximum output frequency is 90 Hz.

   ( ) COMPLETED INITIALS: _____

4. Index the micro-speed control toggle switch on the radio transmitter to the ENA position. Operate the main hoist in each direction and observe the main hoist frequency drive (HAFD) display to ensure that the maximum output frequency is 6 Hz. Index the micro-speed control toggle switch on the radio transmitter back to the DIS position.

   ( ) COMPLETED INITIALS: _____

H. Aux Hoist Control- Radio

1. With the aux hoist critical load toggle switch indexed to the CRIT position, slowly push the aux hoist control lever forward and observe that the hoist operates in the lowering direction at an increasing rate of speed. Observe the aux hoist frequency drive (AHAFD) display to ensure that the maximum output frequency is 60 Hz.

   ( ) COMPLETED INITIALS: _____

2. With the aux hoist critical load toggle switch indexed to the CRIT position, slowly pull the aux hoist control lever back and observe that the hoist operates in the raising direction at an increasing rate of speed. Observe the aux hoist frequency drive (AHAFD) display to ensure that the maximum output frequency is 60 Hz.

   ( ) COMPLETED INITIALS: _____

3. Index the aux hoist critical load toggle switch to the NORM position. Operate the hoist in each direction and observe the aux hoist frequency drive (AHAFD) display to ensure that the maximum output frequency is 90 Hz.

   ( ) COMPLETED INITIALS: _____

4. Index the micro-speed control toggle switch on the radio transmitter to the ENA position. Operate the aux hoist in each direction and observe the aux hoist frequency drive (AHAFD) display to ensure that the maximum output frequency is 6 Hz. Index the micro-speed control toggle switch on the radio transmitter back to the DIS position.

   ( ) COMPLETED INITIALS: _____

I. Trolley Control- Radio

1. Slowly push the trolley control lever forward and observe that the trolley operates in the west direction at an increasing rate of speed. Observe the trolley frequency drive (TAFD) display to ensure that the maximum output frequency is 60 Hz.

( ) COMPLETED INITIALS: _____

2. Slowly pull the trolley control lever back and observe that the trolley operates in the east direction at an increasing rate of speed. Observe the trolley frequency drive (TAFD) display to ensure that the maximum output frequency is 60 Hz.

( ) COMPLETED INITIALS: _____

3. Index the micro-speed control toggle switch on the radio transmitter to the ENA position. Operate the trolley in each direction and observe the trolley frequency drive (TAFD) display to ensure that the maximum output frequency is 15 Hz. Index the micro-speed control toggle switch on the radio transmitter back to the DIS position.

( ) COMPLETED INITIALS: _____

4. Index the single motion control toggle switch on the radio transmitter to the SNGL position. Operate the main hoist in either direction and then attempt to operate the trolley. Verify that trolley operation in both directions is disabled when the main hoist motor is energized (including load float time). Index the single motion control toggle switch on the radio transmitter back to the NRM position and confirm that simultaneous main hoist and trolley operation is possible.

( ) COMPLETED INITIALS: _____

J. Bridge Control- Radio

1. Slowly push the bridge control lever forward and observe that the bridge operates in the south direction at an increasing rate of speed. Observe the bridge frequency drive (BAFD) display to ensure that the maximum output frequency is 60 Hz.

( ) COMPLETED INITIALS: _____

2. Slowly pull the bridge control lever back and observe that the bridge operates in the north direction at an increasing rate of speed. Observe the bridge frequency drive (BAFD) display to ensure that the maximum output frequency is 60 Hz.

( ) COMPLETED INITIALS: _____

3. Index the micro-speed control toggle switch on the radio transmitter to the ENA position. Operate the bridge in each direction and observe the bridge frequency drive (BAFD) display to ensure that the maximum output frequency is 15 Hz. Index the micro-speed control toggle switch on the radio transmitter back to the DIS position.

( ) COMPLETED INITIALS: _____

4. Index the single motion control toggle switch on the radio transmitter to the SNGL position. Operate the main hoist in either direction and then attempt to operate the bridge. Verify that bridge operation in both directions is disabled when the main hoist motor is energized (including load float time). Index the single motion control toggle switch on the radio transmitter back to the NRM position and confirm that simultaneous main hoist and bridge operation is possible.

( ) COMPLETED INITIALS: _____

K. Main Hoist Control- Limits

Note: Utilize the radio control transmitter when performing the following steps in order to verify transmitter status LED operation. Ensure that the transmitter LED status toggle switch is indexed to the MH position.

1. Observe the main hydraulic power unit pressure gauge (GA1) while cycling the main and aux hoist hydraulic drum brake calipers by energizing and de-energizing the main contactor (M). Ensure that the hydraulic pressure switch (PS) cycles the pump motor to maintain a hydraulic system pressure between 1600 and 1750 PSI. Record the maximum observed hydraulic system pressure below.

   Maximum hydraulic system pressure: _____

   ( ) COMPLETED INITIALS: _____

2. Cycle the main and aux hoist hydraulic drum brake calipers by energizing and de-energizing the main contactor (M). With a clamp-on ammeter, measure and record the hydraulic pump motor current in each phase (wire numbers PT1, PT2, PT3) at the terminal strip in the main hoist control enclosure (ENCL1).

   Pump motor current (PT1): _____

   Pump motor current (PT2): _____

   Pump motor current (PT3): _____

   Acceptable pump motor current: ≤ 4.8 A

   ( ) COMPLETED INITIALS: _____

3. Close the main hoist isolation valve (ISVM) at the hydraulic power unit by rotating the valve handle 90° in the clockwise direction. Energize the main contactor (M) and observe that the main hoist drum brakes do not release when hydraulic valve position proximity switch 1 (HVPS1) indicates that the main hoist isolation valve is closed. Verify that main hoist operation in both directions is disabled when the hydraulic drum brake release proximity sensors (HBPS1 - 4) do not indicate that the hydraulic brake calipers have released. Open the isolation valve and ensure that main hoist operation in both directions is possible after the drum brakes are released.

( ) COMPLETED INITIALS: _____

4. Operate the main hoist in the raising direction and verify the main hoist travel limit switch (HTLS) causes the hoist motion to slow and then stop at the upper limit cam setting (HTLS-U). Observe the main hoist frequency drive (HAFD) display to ensure that the programmed maximum slow-down output frequency is 15 Hz. Measure and record the distance from the ground floor (18'-0" elevation) to the hook saddles. Confirm that the hoist lowering motion remains unaffected. Operate the hoist in the lowering direction until the upper slow-down and stop limits are reset and confirm that main hoist operation in both directions is enabled.

Measured hook elevation: _____

Acceptable hook elevation: 102'-10" ± 3"

( ) COMPLETED INITIALS: _____

5. Install a jumper wire between terminals 206 and 210 at the terminal strip in the main hoist control enclosure (ENCL1) to bypass the main hoist geared upper travel limit switch (HTLS-U). Operate the main hoist in the raising direction and verify the main hoist power paddle limit switch (HPLS) is actuated when the lower block lifts the tripper arm. Verify that the switch causes the hoist to stop before the lower block contacts the trolley structure, both shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second. Confirm that hoist operation in both directions is disabled. Ensure that the main hoist overtravel limit switch pilot light (PL6), radio receiver overtravel limit LED, and main hoist general fault beacon light (BCN2) are all illuminated.

( ) COMPLETED INITIALS: _____

6. With the main hoist power paddle limit switch (HPLS) tripped, index the main hoist power limit bypass keyswitch (KSW4) from NORM to BYP. Verify that hoist operation in the lowering direction is enabled while operation in the raising direction is disabled. Operate the hoist in the lowering direction until the paddle limit switch is reset and then return the bypass keyswitch to the NORM position. Confirm that main hoist operation in both directions has been restored and the fault lights are off. Remove the jumper wire between terminals 206 and 210.

   ( ) COMPLETED INITIALS: _____

7. Operate the main hoist in the lowering direction and verify the main hoist travel limit switch (HTLS) causes the hoist motion to stop at the lower limit cam setting (HTLS-D). Measure and record the distance from the ground floor (18'-0" elevation) to the hook saddles. Confirm that the hoist raising motion remains unaffected. Operate the hoist in the raising direction until the lower limit is reset and confirm that main hoist operation in both directions is enabled.

   Measured hook elevation: _____

   Acceptable hook elevation: 21'-0" ± 3"

   ( ) COMPLETED INITIALS: _____

8. Install a jumper wire between terminals 224 and 230 at the terminal strip in the main hoist control enclosure (ENCL1) to bypass the main hoist geared lower travel limit switch (HTLS-D). Operate the main hoist in the lowering direction and verify that the main hoist redundant low limit switch (HDLS) causes the hoist to stop before the hook contacts the ground, both shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second. Confirm that hoist operation is disabled in both directions. Observe that a minimum of two full wraps of wire rope remain on the drum. Ensure that the main hoist overtravel limit switch pilot light (PL6), radio receiver overtravel limit LED, and main hoist general fault beacon light (BCN2) are all illuminated. Measure and record the distance from the ground floor (18'-0" elevation) to the hook saddles.

   Measured hook elevation: _____

   Acceptable hook elevation: 20'-0" ± 3"

   ( ) COMPLETED INITIALS: _____

9. With the main hoist redundant low limit switch (HDLS) tripped, index the main hoist redundant low limit bypass keyswitch (KSW5) from NORM to BYP. Verify that hoist operation in the raising direction is enabled while operation in the lowering direction is disabled. Operate the hoist in the raising direction until the limit switch is reset. Return the bypass keyswitch to the NORM position. Confirm that main hoist operation in both directions has been restored and the fault lights are off. Remove the jumper wire between terminals 224 and 230.

( ) COMPLETED INITIALS: _____

10. Manually actuate main hoist equalizer limit switch 1 (HELS1), located on the northeast side of the main hoist equalizer assembly. Verify that main hoist operation in the raising direction is disabled while lowering remains unaffected. Ensure that the main hoist equalizer limit switch pilot light (PL10), radio receiver equalizer limit LED, and main hoist general fault beacon light (BCN2) are all illuminated. Release equalizer limit switch 1 and manually actuate main hoist equalizer limit switch 2 (HELS2) located on the northwest side of the equalizer assembly. Repeat the above control verification steps.

( ) COMPLETED INITIALS: _____

11. With main hoist equalizer limit switch 2 (HELS2) held in the tripped position, index the main hoist equalizer limit bypass keyswitch (KSW16) from NORM to BYP. Verify that hoist operation in both directions is enabled. Return the bypass keyswitch to the NORM position. Release the limit switch to its normal position and confirm that main hoist operation in both directions has been restored.

( ) COMPLETED INITIALS: _____

12. Disconnect and isolate wire number 39 from the terminal strip in the main hoist control enclosure (ENCL1) to simulate a main hoist motor or resistor thermostat (HMTP, HRTP1, HRTP2) trip. Verify that main hoist operation in both directions is disabled. Ensure that the main hoist overheat fault pilot light (PL12), radio receiver overheat fault LED, and main hoist general fault beacon light (BCN2) are all illuminated. Reconnect the wire and confirm normal main hoist operation. Ensure that all fault lights are off.

( ) COMPLETED INITIALS: _____

13. Pass a short length of electrical cable or tool handle with a diameter similar to the 1.25" main hoist wire rope across the east hoist drum grooves to simulate a mis-spooling condition that momentarily disrupts the infrared light beam between the east main hoist photo sensors (HPS1-E, HPS1-R). Confirm that hoist operation in both directions is disabled. Ensure that the main hoist mis-spool fault pilot light (PL14), radio receiver mis-spool fault LED, and main hoist general fault beacon light (BCN2) are all illuminated.

( ) COMPLETED INITIALS: _____

14. Index the main hoist mis-spooling fault bypass/reset keyswitch (KSW8) from NORM to BYPASS. Verify that hoist operation in the lowering direction is enabled while operation in the raising direction is disabled. Momentarily index the keyswitch from BYPASS to RESET and then return the keyswitch to the NORM position. Confirm that main hoist operation in both directions has been restored and all fault lights are off.

( ) COMPLETED INITIALS: _____

15. Pass a short length of electrical cable or tool handle with a diameter similar to the 1.25" main hoist wire rope across the west hoist drum grooves to simulate a mis-spooling condition that momentarily disrupts the infrared light beam between the west main hoist photo sensors (HPS2-E, HPS2-R). Confirm that hoist operation in both directions is disabled. Ensure that the main hoist mis-spool fault pilot light (PL14), radio receiver mis-spool fault LED, and main hoist general fault beacon light (BCN2) are all illuminated.

( ) COMPLETED INITIALS: _____

16. Index the main hoist mis-spooling fault bypass/reset keyswitch (KSW8) from NORM to BYPASS. Verify that hoist operation in the lowering direction is enabled while operation in the raising direction is disabled. Momentarily index the keyswitch from BYPASS to RESET and then return the keyswitch to the NORM position. Confirm that main hoist operation in both directions has been restored and all fault lights are off.

( ) COMPLETED INITIALS: _____

17. With the main hoist critical load toggle switch indexed to the CRIT position, operate the main hoist at maximum speed in each direction for 1 minute, measure the distance traveled by the hook block, and record the maximum raising and lowering speeds in feet-per-minute below. Next, observe the main hoist drum overspeed detectors (HSD1, HSD2) while operating the hoist in the raising and lowering directions at maximum speed and ensure that both displays indicate the correct hoist speed (± 0.2 FPM).

    Measured distance in raising direction: _____

    Maximum raising hoist speed (measured): _____

    Maximum raising hoist speed (HSD1): _____

    Maximum raising hoist speed (HSD2): _____

    Measured distance in lowering direction: _____

    Maximum lowering hoist speed (measured): _____

    Maximum lowering hoist speed (HSD1): _____

    Maximum lowering hoist speed (HSD2): _____

    Acceptable maximum hoist speed: 5 ± 0.5 FPM

    ( ) COMPLETED INITIALS: _____

18. Index the main hoist critical load toggle switch to the NRM position. Operate the main hoist at maximum speed in each direction while observing the main hoist drum overspeed detectors (HSD1, HSD2). Record the indicated maximum raising and lowering speeds in feet-per-minute below.

    Maximum raising hoist speed (HSD1): _____

    Maximum raising hoist speed (HSD2): _____

    Maximum lowering hoist speed (HSD1): _____

    Maximum lowering hoist speed (HSD2): _____

    Acceptable maximum hoist speed: 7.5 ± 0.7 FPM

    ( ) COMPLETED INITIALS: _____

19. Index the main hoist speed display back-up power keyswitch (KSW11) to the ENA position and observe that the main hoist drum overspeed detectors (HSD1, HSD2) do not function to indicate the hoist speed. Utilizing an extension cord, connect the main hoist speed display backup power supply cord to an external 120VAC power source. After connecting the external power source, operate the hoist in both directions and verify that the main hoist drum overspeed detectors function to indicate the hoist speed. Return the main hoist speed display back-up power keyswitch to the DIS position and disconnect the cord from the external power source.

( ) COMPLETED INITIALS: _____

20. Adjust main hoist frequency drive (HAFD) parameter H3-02 from 66.7 to 100 and parameter C6-09 from 60 to 120. Additionally, remove the jumper wire between terminals 7 and 8 and then adjust parameter P1 on the west main hoist drum overspeed detector (HSD2) from 5.8 to 10.0. With the main hoist critical load toggle switch indexed to the CRIT position, operate the hoist in the lowering direction at an increasing rate of speed. Verify that the east main hoist drum overspeed detector (HSD1) causes the hoist motor to stop, both shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second when the lowering speed exceeds 5.8 FPM. Confirm that hoist operation in both directions is disabled. Ensure that the main hoist overspeed fault pilot light (PL16), radio receiver overspeed fault LED, and main hoist general fault beacon light (BCN2) are all illuminated.

( ) COMPLETED INITIALS: _____

21. With the main hoist overspeed fault active, momentarily index the main hoist overspeed reset keyswitch (KSW12) from NORM to RESET. Remove the jumper wire between terminals 7 and 8 and then adjust parameter P1 on the east main hoist drum overspeed detector (HSD1) from 5.8 to 10.0. Confirm that main hoist operation in both directions has been restored and all fault lights are off.

( ) COMPLETED INITIALS: _____

22. Adjust parameter P1 on the west main hoist drum overspeed detector (HSD2) from 10.0 to 5.8. With the main hoist critical load toggle switch indexed to the CRIT position, operate the hoist in the lowering direction at an increasing rate of speed. Verify that the west main hoist drum overspeed detector (HSD2) causes the hoist motor to stop, both shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second when the lowering speed exceeds 5.8 FPM. Confirm that hoist operation in both directions is disabled. Ensure that the main hoist overspeed fault pilot light (PL16), radio receiver overspeed fault LED, and main hoist general fault beacon light (BCN2) are all illuminated.

( ) COMPLETED INITIALS: _____

23. With the main hoist overspeed fault active, momentarily index the main hoist overspeed reset keyswitch (KSW12) from NORM to RESET. Adjust parameter P1 on the east main hoist drum overspeed detector (HSD1) from 10.0 to 5.8. Adjust main hoist frequency drive (HAFD) parameter H3-02 from 100 to 66.7 and parameter C6-09 from 120 to 60. Confirm that main hoist operation in both directions has been restored and all fault lights are off.

( ) COMPLETED INITIALS: _____

24. Adjust parameter P2 on the east main hoist drum overspeed detector (HSD1) from 8.0 to 7.0. With the main hoist critical load toggle switch indexed to the NRM position, operate the hoist in the lowering direction at an increasing rate of speed. Verify that the east main hoist drum overspeed detector causes the hoist motor to stop, both shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second when the lowering speed exceeds 7.0 FPM. Confirm that hoist operation in both directions is disabled. Ensure that the main hoist overspeed fault pilot light (PL16), radio receiver overspeed fault LED, and main hoist general fault beacon light (BCN2) are all illuminated.

( ) COMPLETED INITIALS: _____

25. With the main hoist overspeed fault active, momentarily index the main hoist overspeed reset keyswitch (KSW12) from NORM to RESET. Adjust parameter P2 on the east main hoist drum overspeed detector (HSD1) from 7.0 to 8.0. Confirm that main hoist operation in both directions has been restored and all fault lights are off.

( ) COMPLETED INITIALS: _____

26. Adjust parameter P2 on the west main hoist drum overspeed detector (HSD2) from 8.0 to 7.0. With the main hoist critical load toggle switch indexed to the NRM position, operate the hoist in the lowering direction at an increasing rate of speed. Verify that the west main hoist drum overspeed detector causes the hoist motor to stop, both shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second when the lowering speed exceeds 7.0 FPM. Ensure that the main hoist overspeed fault pilot light (PL16), radio receiver overspeed fault LED, and main hoist general fault beacon light (BCN2) are all illuminated.

( ) COMPLETED INITIALS: _____

27. With the main hoist overspeed fault active, momentarily index the main hoist overspeed reset keyswitch (KSW12) from NORM to RESET. Adjust parameter P2 on the west main hoist drum overspeed detector (HSD2) from 7.0 to 8.0. Confirm that main hoist operation in both directions has been restored and all fault lights are off. Replace the jumper wires between terminals 7 and 8 on both the east and west main hoist overspeed detectors (HSD1, HSD2).

( ) COMPLETED INITIALS: _____

28. While operating the main hoist in the lowering direction, disconnect the encoder plug from the main hoist motor. Verify that a main hoist frequency drive (HAFD) fault causes the hoist motor to stop, both shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second. Confirm that hoist operation in both directions is disabled. Ensure that the main hoist AFD fault pilot light (PL18), radio receiver AFD fault LED, and main hoist general fault beacon light (BCN2) are all illuminated. Reconnect the encoder plug and press the fault reset button on the frequency drive. Verify normal main hoist operation in both directions and all fault lights are off.

( ) COMPLETED INITIALS: _____

29. Lift a test load weighing a minimum of 10 tons. While operating the main hoist in the raising direction, manually block the east hoist shoe brake open and then stop the hoist by releasing the control lever to the neutral position. After the load float time has expired, ensure that the main hoist shoe brake slip fault pilot light (PL4), radio receiver brake slip fault LED, and main hoist general fault beacon light (BCN2) are all illuminated. Attempt to operate the hoist in the raising direction and verify that only minimum speed (6 Hz, maximum) operation is possible, while normal speed control is enabled in the lowering direction. Remove the block from the east shoe brake, operate the hoist in the lowering direction, and then stop the hoist by releasing the control lever to the neutral position. Observe that all fault lights are de-energized after the shoe brake is set. Verify normal main hoist operation in both directions is possible with the fault lights off.

( ) COMPLETED INITIALS: _____

30. Index the radio transmitter analog display toggle switch to the MH position to enable display of the main hoist net weight value. Slowly lift a test load weighing a minimum of 10 tons in order to change the displayed weight value on the main hoist weigh scale indicator (HWSI). Ensure that the radio receiver display closely tracks the weight value on the weigh scale indicator. Press the weigh scale tare pushbutton (PB4) on the cab chair console and ensure that the net weight value is zeroed on the weigh scale indicator and radio receiver.

( ) COMPLETED INITIALS: _____

L. Aux Hoist Control- Limits

Note: Utilize the radio control transmitter when performing the following steps in order to verify transmitter status LED operation. Ensure that the transmitter LED status toggle switch is indexed to the AH position.

1. Close the aux hoist isolation valve (ISVA) at the hydraulic power unit by rotating the valve handle 90° in the clockwise direction. Energize the main contactor (M) and observe that the aux hoist drum brake does not release when hydraulic valve position proximity switch 2 (HVPS2) indicates that the aux hoist isolation valve is closed. Verify that aux hoist operation in both directions is disabled when the aux hoist hydraulic drum brake release proximity sensor (AHBPS) does not indicate that the hydraulic brake caliper has released. Open the isolation valve and ensure that aux hoist operation in both directions is possible after the drum brake is released.

   ( ) COMPLETED INITIALS: _____

2. Operate the aux hoist in the raising direction and verify the aux hoist travel limit switch (AHTLS) causes the hoist motion to slow and then stop at the upper limit cam setting (AHTLS-U). Observe the aux hoist frequency drive (AHAFD) display to ensure that the programmed maximum slow-down output frequency is 15 Hz. Measure and record the distance from the ground floor (18'-0" elevation) to the hook saddle. Confirm that the hoist lowering motion remains unaffected. Operate the hoist in the lowering direction until the upper slow-down and stop limits are reset and confirm that aux hoist operation in both directions is enabled.

   Measured hook elevation: _____

   Acceptable hook elevation: 103'-10" ± 3"

   ( ) COMPLETED INITIALS: _____

3. Install a jumper wire between terminals 305 and 310 at the terminal strip in the aux hoist control enclosure (ENCL2) to bypass the aux hoist geared upper travel limit switch (AHTLS-U). Operate the aux hoist in the raising direction and verify the aux hoist power paddle limit switch (AHPLS) is actuated when the lower block lifts the tripper arm. Verify that the switch causes the hoist to stop before the lower block contacts the trolley structure, the disc and shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second. Confirm that hoist operation in both directions is disabled. Ensure that the aux hoist overtravel limit switch pilot light (PL7), radio receiver overtravel limit LED, and aux hoist general fault beacon light (BCN3) are all illuminated.

( ) COMPLETED INITIALS: _____

4. With the aux hoist power paddle limit switch (AHPLS) tripped, index the aux hoist power limit bypass keyswitch (KSW6) from NORM to BYP. Verify that hoist operation in the lowering direction is enabled while operation in the raising direction is disabled. Operate the hoist in the lowering direction until the paddle limit switch is reset and then return the bypass keyswitch to the NORM position. Confirm that aux hoist operation in both directions has been restored and the fault lights are off. Remove the jumper wire between terminals 305 and 310.

( ) COMPLETED INITIALS: _____

5. Operate the aux hoist in the lowering direction and verify the aux hoist travel limit switch (AHTLS) causes the hoist motion to stop at the lower limit cam setting (AHTLS-D). Measure and record the distance from the ground floor (18'-0" elevation) to the hook saddle. Confirm that the hoist raising motion remains unaffected. Operate the hoist in the raising direction until the lower limit is reset and confirm that aux hoist operation in both directions is enabled.

Measured hook elevation: _____

Acceptable hook elevation: 20'-0" ± 5"

( ) COMPLETED INITIALS: _____

6. Install a jumper wire between terminals 323 and 330 at the terminal strip in the aux hoist control enclosure (ENCL2) to bypass the aux hoist geared lower travel limit switch (AHTLS-D). Operate the aux hoist in the lowering direction and verify that the aux hoist redundant low limit switch (AHDLS) causes the hoist motor to stop, the disc and shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second. Confirm that hoist operation in both directions is disabled. Observe that a minimum of two full wraps of wire rope remain on the drum. Ensure that the aux hoist overtravel limit switch pilot light (PL7), radio receiver overtravel limit LED, and aux hoist general fault beacon light (BCN3) are all illuminated. Measure and record the distance from the ground floor (18'-0" elevation) to the hook saddle.

   Measured hook elevation: _____

   Acceptable hook elevation: 19'-0" ± 5"

   ( ) COMPLETED INITIALS: _____

7. With the aux hoist redundant low limit switch (AHDLS) tripped, index the aux hoist redundant low limit bypass keyswitch (KSW7) from NORM to BYP. Verify that hoist operation in the raising direction is enabled while operation in the lowering direction is disabled. Operate the hoist in the raising direction until the limit switch is reset. Return the bypass keyswitch to the NORM position. Confirm that aux hoist operation in both directions has been restored and the fault lights are off. Remove the jumper wire between terminals 323 and 330.

   ( ) COMPLETED INITIALS: _____

8. Lower the aux hoist lower block onto supports. After the block is set down, continue to operate the hoist in the lowering direction to produce slack in the wire rope falls. Stop the hoist and manually pull down on the fixed wire rope fall on the north side of the block to rotate the aux hoist equalizer and cause aux hoist equalizer proximity switch 1 (AHEPS1) to detect an unbalanced load condition. Verify that aux hoist operation in the raising direction is disabled while lowering remains unaffected. Ensure that the aux hoist equalizer limit switch pilot light (PL11), radio receiver equalizer limit LED, and aux hoist general fault beacon light (BCN3) are all illuminated. Pull down on the fixed wire rope fall on the south side of the block to rotate the aux hoist equalizer back to the centered position and observe that all fault lights are off.

   ( ) COMPLETED INITIALS: _____

9. Manually pull down on the fixed wire rope fall on the south side of the block to rotate the aux hoist equalizer and cause aux hoist equalizer proximity switch 2 (AHEPS2) to detect an unbalanced load condition. Verify that aux hoist operation in the raising direction is disabled while lowering remains unaffected. Ensure that the aux hoist equalizer limit switch pilot light (PL11), radio receiver equalizer limit LED, and aux hoist general fault beacon light (BCN3) are all illuminated.

( ) COMPLETED INITIALS: _____

10. With aux hoist equalizer proximity switch 2 (AHEPS2) detecting an unbalanced load condition, index the aux hoist equalizer limit bypass keyswitch (KSW18) from NORM to BYP. Verify that hoist operation in both directions is enabled. Return the bypass keyswitch to the NORM position. Pull down on the fixed wire rope fall on the north side of the block to rotate the aux hoist equalizer back to the centered position. Confirm that aux hoist operation in both directions has been restored and all fault lights are off. Raise the lower block off its supports.

( ) COMPLETED INITIALS: _____

11. Disconnect and isolate wire number 52 from the terminal strip in the aux hoist control enclosure (ENCL2) to simulate an aux hoist motor or resistor thermostat (HMTP, HRTP) trip. Verify that aux hoist operation in both directions is disabled. Ensure that the aux hoist overheat fault pilot light (PL13), radio receiver overheat fault LED, and aux hoist general fault beacon light (BCN3) are all illuminated. Reconnect the wire and confirm normal aux hoist operation. Ensure that all fault lights are off.

( ) COMPLETED INITIALS: _____

12. Pass a short length of electrical cable or tool handle with a diameter similar to the 0.75" aux hoist wire rope across the hoist drum grooves to simulate a mis-spooling condition that momentarily disrupts the infrared light beam between the aux hoist photo sensors (AHPS-E, AHPS-R). Confirm that hoist operation in both directions is disabled. Ensure that the aux hoist mis-spool fault pilot light (PL15), radio receiver mis-spool fault LED, and aux hoist general fault beacon light (BCN3) are all illuminated.

( ) COMPLETED INITIALS: _____

13. Index the aux hoist mis-spooling fault bypass/reset keyswitch (KSW9) from NORM to BYPASS. Verify that hoist operation in the lowering direction is enabled while operation in the raising direction is disabled. Momentarily index the keyswitch from BYPASS to RESET and then return the keyswitch to the NORM position. Confirm that aux hoist operation in both directions has been restored and all fault lights are off.

( ) COMPLETED INITIALS: _____

14. With the aux hoist critical load toggle switch indexed to the CRIT position, operate the aux hoist at maximum speed in each direction for 1 minute, measure the distance traveled by the hook block, and record the maximum raising and lowering speeds in feet-per-minute below. Next, observe the aux hoist drum overspeed detector (AHSD) while operating the hoist in the raising and lowering directions at maximum speed and ensure that the display indicates the correct hoist speed (± 0.2 FPM).

Measured distance in raising direction: _____

Maximum raising hoist speed (measured): _____

Maximum raising hoist speed (AHSD): _____

Measured distance in lowering direction: _____

Maximum lowering hoist speed (measured): _____

Maximum lowering hoist speed (AHSD): _____

Acceptable maximum hoist speed: 15 ± 1.5 FPM

( ) COMPLETED INITIALS: _____

15. Index the aux hoist critical load toggle switch to the NRM position. Operate the aux hoist at maximum speed in each direction while observing the aux hoist drum overspeed detector (AHSD). Record the indicated maximum raising and lowering speeds in feet-per-minute below.

    Maximum raising hoist speed (AHSD): _____

    Maximum lowering hoist speed (AHSD): _____

    Acceptable maximum hoist speed: 22.5 ± 2.2 FPM

    ( ) COMPLETED INITIALS: _____

16. Index the aux hoist speed display back-up power keyswitch (KSW13) to the ENA position and observe that the aux hoist drum overspeed detector (AHSD) does not function to indicate the hoist speed. Utilizing an extension cord, connect the aux hoist speed display backup power supply cord to an external 120VAC power source. After connecting the external power source, operate the hoist in both directions and verify that the aux hoist drum overspeed detector functions to indicate the hoist speed. Return the aux hoist speed display back-up power keyswitch to the DIS position and disconnect the cord from the external power source.

    ( ) COMPLETED INITIALS: _____

17. Adjust aux hoist frequency drive (AHAFD) parameter H3-02 from 66.7 to 100 and parameter C6-09 from 60 to 120. With the aux hoist critical load toggle switch indexed to the CRIT position, operate the hoist in the lowering direction at an increasing rate of speed. Verify that the aux hoist drum overspeed detector (AHSD) causes the hoist motor to stop, the disc and shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second when the lowering speed exceeds 16.5 FPM. Confirm that hoist operation in both directions is disabled. Ensure that the aux hoist overspeed fault pilot light (PL17), radio receiver overspeed fault LED, and aux hoist general fault beacon light (BCN3) are all illuminated.

    ( ) COMPLETED INITIALS: _____

18. With the aux hoist overspeed fault active, momentarily index the aux hoist overspeed reset keyswitch (KSW14) from NORM to RESET. Adjust aux hoist frequency drive (AHAFD) parameter H3-02 from 100 to 66.7 and parameter C6-09 from 120 to 60. Confirm that aux hoist operation in both directions has been restored and all fault lights are off.

( ) COMPLETED INITIALS: _____

19. Remove the jumper wire between terminals 7 and 8 and adjust parameter P2 on the aux hoist drum overspeed detector (AHSD) from 25.0 to 20.0. With the aux hoist critical load toggle switch indexed to the NRM position, operate the hoist in the lowering direction at an increasing rate of speed. Verify that the aux hoist drum overspeed detector (AHSD) causes the hoist motor to stop, the disc and shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second when the lowering speed exceeds 20.0 FPM. Confirm that hoist operation in both directions is disabled. Ensure that the aux hoist overspeed fault pilot light (PL16), radio receiver overspeed fault LED, and aux hoist general fault beacon light (BCN3) are all illuminated.

( ) COMPLETED INITIALS: _____

20. With the aux hoist overspeed fault active, momentarily index the aux hoist overspeed reset keyswitch (KSW14) from NORM to RESET. Adjust parameter P2 on the aux hoist drum overspeed detector (AHSD) from 20.0 to 25.0. Confirm that aux hoist operation in both directions has been restored and all fault lights are off. Replace the jumper wire between terminals 7 and 8 on the aux hoist overspeed detector.

( ) COMPLETED INITIALS: _____

21. While operating the aux hoist in the lowering direction, disconnect the encoder plug from the aux hoist motor. Verify that an aux hoist frequency drive (AHAFD) fault causes the hoist motor to stop, the disc and shoe brakes to immediately set, and the drum brake to set after a minimum delay time of 1 second. Confirm that hoist operation in both directions is disabled. Ensure that the aux hoist AFD fault pilot light (PL19), radio receiver AFD fault LED, and aux hoist general fault beacon light (BCN3) are all illuminated. Reconnect the encoder plug and press the fault reset button on the frequency drive. Verify normal aux hoist operation in both directions and all fault lights are off.

( ) COMPLETED INITIALS: _____

22. Lift a test load weighing a minimum of 3 tons. While operating the aux hoist in the raising direction, hold the disc brake manual release handle in the open position and then stop the hoist by releasing the control lever to the neutral position. After the load float time has expired, ensure that the aux hoist disc brake slip fault pilot light (PL5), radio receiver brake slip fault LED, and aux hoist general fault beacon light (BCN3) are all illuminated. Attempt to operate the hoist in the raising direction and verify that only minimum speed (6 Hz, maximum) operation is possible, while normal speed control is enabled in the lowering direction. Return the disc brake manual release handle to its normal position, operate the hoist in the lowering direction and then stop the hoist by releasing the control lever to the neutral position. Observe that all fault lights are de-energized after the disc brake is set. Verify normal aux hoist operation in both directions is possible with the fault lights off.

( ) COMPLETED INITIALS: _____

23. Index the radio transmitter analog display toggle switch to the AH position to enable display of the aux hoist net weight value. Slowly lift a test load weighing a minimum of 3 tons in order to change the displayed weight value on the aux hoist weigh scale indicator (AHWSI). Ensure that the radio receiver display closely tracks the weight value on the weigh scale indicator. Press the weigh scale tare pushbutton (PB4) on the cab chair console and ensure that the net weight value is zeroed on the weigh scale indicator and radio receiver.

( ) COMPLETED INITIALS: _____

M. Trolley Control- Limits

1. Operate the trolley in the east direction at maximum speed and verify that the trolley east slow-down limit switch (TESLS) causes the trolley to slow as it approaches the east end stop. Observe the trolley frequency drive (TAFD) display to ensure that the programmed maximum slow-down output frequency is 15 Hz. Confirm that trolley west speed control remains unaffected.

   ( ) COMPLETED INITIALS: _____

2. Continue to operate the trolley in the east direction after the slow-down limit switch has been actuated and verify that the trolley travel limit switch (TTLS) stops the trolley at the east end stop. Measure and record the distance from the centerline of the main hoist hook to the centerline of the east runway rail below. Verify that trolley motion towards the west remains unaffected.

   Measured east hook approach: _____

   Acceptable east hook approach: 7'-6" ± 3"

   ( ) COMPLETED INITIALS: _____

3. Operate the trolley in the west direction at maximum speed and verify that the trolley west slow-down limit switch (TWSLS) causes the trolley to slow as it approaches the west end stop. Observe the trolley frequency drive (TAFD) display to ensure that the programmed maximum slow-down output frequency is 15 Hz. Confirm that trolley east speed control remains unaffected.

   ( ) COMPLETED INITIALS: _____

4. Continue to operate the trolley in the west direction after the slow-down limit switch has been actuated and verify that the trolley travel limit switch (TTLS) stops the trolley at the west end stop. Measure and record the distance from the centerline of the main hoist hook to the centerline of the west runway rail below. Verify that trolley motion towards the east remains unaffected.

   Measured west hook approach: _____

   Acceptable west hook approach: 7'-9" ± 3"

   ( ) COMPLETED INITIALS: _____

5. Disconnect and isolate wire number 450 from the terminal strip in the trolley control enclosure (ENCL2) to simulate a trolley motor thermostat (TTP1, TTP2) trip. Verify that trolley operation in both directions is disabled. Ensure that the trolley frequency drive fault pilot light (PL2) and beacon light (BCN4) are both illuminated. Reconnect the wire and press the reset button on the frequency drive keypad. Ensure that both fault lights are off and confirm normal trolley operation.

   ( ) COMPLETED INITIALS: _____

6. Move the trolley to the west bridge endstops in position to engage the trolley wind lock receptacles. Manually lower the north trolley wind lock pin into its receptacle on the bridge. Verify that all trolley motion is disabled when trolley wind lock limit switch 1 (TLLS1) indicates that the north wind lock is engaged. Disengage the north wind lock pin and verify that the trolley can be operated toward the east.

   ( ) COMPLETED INITIALS: _____

7. Move the trolley to the west bridge endstops in position to engage the trolley wind lock receptacles. Manually lower the south trolley wind lock pin into its receptacle on the bridge. Verify that all trolley motion is disabled when trolley wind lock limit switch 2 (TLLS2) indicates that the south wind lock is engaged. Disengage the south wind lock pin and verify that the trolley can be operated toward the east.

   ( ) COMPLETED INITIALS: _____

8. Enable the normal trolley speed control range (60 Hz, 40 FPM nominal). Place two marks along the trolley rail spaced 60' apart. While allowing an adequate distance for acceleration, measure the time required for the trolley to travel between the two marks at maximum speed in the east direction. Repeat the measurement for trolley operation in the west direction. Calculate and record the trolley speed in feet-per-minute below (FPM = 3600 ÷ measured time in seconds).

   Measured time in east direction (seconds): _____

   Maximum east trolley speed (FPM): _____

   Measured time in west direction (seconds): _____

   Maximum west trolley speed (FPM): _____

   Acceptable maximum trolley speed: 40 ± 4 FPM

   ( ) COMPLETED INITIALS: _____

N. Bridge Control- Limits

1. Operate the bridge in the north direction at maximum speed and verify that the bridge north slow-down limit switch (BNSLS) causes the bridge to slow as it approaches the north runway endstop. Observe the bridge frequency drive (BAFD) display to ensure that the programmed maximum slow-down output frequency is 15 Hz. Confirm that bridge south speed control remains unaffected.

   ( ) COMPLETED INITIALS: _____

2. Continue to operate the bridge in the north direction after the slow-down limit switch has been actuated and verify that the bridge travel limit switch (BTLS) stops the bridge at the north runway endstop. Measure and record the distance from the centerline of the main hoist hook to the centerline of northeast runway column 1 below. Confirm that bridge operation to the south remains unaffected.

   Measured north hook approach: _____

   Acceptable north hook approach: 20'-5" ± 3"

   ( ) COMPLETED INITIALS: _____

3. Operate the bridge in the south direction at maximum speed and verify that the bridge south slow-down limit switch (BSSLS) causes the bridge to slow as it approaches the south runway endstop. Observe the bridge frequency drive (BAFD) display to ensure that the programmed maximum slow-down output frequency is 15 Hz. Confirm that bridge north speed control remains unaffected.

   ( ) COMPLETED INITIALS: _____

4. Continue to operate the bridge in the south direction after the slow-down limit switch has been actuated and verify that the bridge travel limit switch (BTLS) stops the bridge at the south runway endstop. Measure and record the distance from the centerline of the main hoist hook to the centerline of southeast runway column 6 below. Confirm that bridge operation to the north remains unaffected.

   Measured south hook approach: _____

   Acceptable south hook approach: 16'-9" ± 3"

   ( ) COMPLETED INITIALS: _____

5. Disconnect and isolate wire number 550 from the terminal strip in the bridge control enclosure (ENCL2) to simulate a bridge motor thermostat (BTP1, BTP2) trip. Verify that bridge operation in both directions is disabled. Ensure that the bridge frequency drive fault pilot light (PL3) and beacon light (BCN5) are both illuminated. Reconnect the wire and press the reset button on the frequency drive keypad. Ensure that both fault lights are off and confirm normal bridge operation.

   ( ) COMPLETED INITIALS: _____

6. Move the bridge to the north runway endstops in position to engage the bridge wind lock receptacles. Manually lower the east bridge wind lock pin into its receptacle on the runway. Verify that all bridge motion is disabled when bridge wind lock limit switch 1 (BLLS1) indicates that the east wind lock is engaged. Disengage the east wind lock pin and verify that the bridge can be operated toward the south.

   ( ) COMPLETED INITIALS: _____

7. Move the bridge to the north runway endstops in position to engage the bridge wind lock receptacles. Manually lower the west bridge wind lock pin into its receptacle on the runway. Verify that all bridge motion is disabled when bridge wind lock limit switch 2 (BLLS2) indicates that the west wind lock is engaged. Disengage the west wind lock pin and verify that the bridge can be operated toward the south.

   ( ) COMPLETED INITIALS: _____

8. Enable the normal bridge speed control range (60 Hz, 50 FPM nominal). Place two marks along the runway rail spaced 60' apart. While allowing an adequate distance for acceleration, measure the time required for the bridge to travel between the two marks at maximum speed in the north direction. Repeat the measurement for bridge operation in the south direction. Calculate and record the bridge speed in feet-per-minute below (FPM = 3600 ÷ measured time in seconds).

   Measured time in north direction (seconds): _____

   Maximum north bridge speed (FPM): _____

   Measured time in south direction (seconds): _____

   Maximum south bridge speed (FPM): _____

   Acceptable maximum bridge speed: 50 ± 5 FPM

   ( ) COMPLETED INITIALS: _____

9. Measure the north and south crane spans. Reference ACECO drawing D-20872-0002 for dimension.

   Measured north crane span: _____

   Measured south crane span: _____

   Required crane span: 102'-0" ±1/4"

   ( ) COMPLETED INITIALS: _____

O. Cable Reel Control and Limits

Note: Closely observe the performance of the cable reeling system during the performance of the following steps and immediately stop bridge operation as necessary to prevent power cable damage. Closely inspect and/or megger test the power cable if it is exposed to excessive forces.

1. Operate the bridge in each direction over the full travel length of the runway. Ensure that the cable reel functions properly to pay out and retrieve the runway power cable as the bridge is operated toward and away from the fixed power feed point near the center of the runway. Observe the power cable as it is enters and exits the cable trough to ensure cable tension is being controlled over the full range of travel and the cable is properly positioned in the trough. Record the motor current displayed on the cable reel frequency drive (CRAFD) below.

   Retrieve direction motor current: _____

   Pay out direction motor current: _____

   Acceptable cable reel motor current: ≤ 3.0 A

   ( ) COMPLETED INITIALS: _____

2. Disconnect and isolate wire number 590 from the terminal strip in the bridge control enclosure (ENCL2) to simulate a cable reel motor thermostat (CRTP) trip. Verify that bridge operation in both directions is disabled. Ensure that the bridge frequency drive fault pilot light (PL3) and beacon light (BCN5) are both illuminated. Reconnect the wire and press the reset buttons on the cable reel and bridge frequency drive keypads (CRAFD, BAFD). Ensure that both fault lights are off and confirm normal bridge and cable reel operation.

   ( ) COMPLETED INITIALS: _____

3. With the bridge positioned to the north of the fixed power feed point near the runway center, manually block the cable spool to prevent rotation. After the spool is blocked, slowly operate the bridge in the north direction and verify that bridge power cable overtension limit switch 1 (CTLS1) is actuated before any cable damage occurs. Verify that bridge operation in both directions is disabled. Ensure that the bridge frequency drive fault pilot light (PL3) and beacon light (BCN5) are both illuminated.

   ( ) COMPLETED INITIALS: _____

4. With bridge power cable overtension limit switch 1 (CTLS1) tripped, de-energize the main contactor (M). After the main contactor is off, remove the block from the cable spool and manually release the cable reel motor disc brake to relieve the cable tension and allow the limit switch to reset. After the limit switch is reset, energize the main contactor and ensure that the bridge frequency drive fault pilot light (PL3) and beacon light (BCN5) are both off. Operate the bridge in both directions and confirm normal bridge and cable reel operation.

( ) COMPLETED INITIALS: _____

5. With the bridge positioned to the south of the fixed power feed point near the runway center, manually block the cable spool to prevent rotation. After the spool is blocked, slowly operate the bridge in the south direction and verify that bridge power cable overtension limit switch 2 (CTLS2) is actuated before any cable damage occurs. Verify that bridge operation in both directions is disabled. Ensure that the bridge frequency drive fault pilot light (PL3) and beacon light (BCN5) are both illuminated.

( ) COMPLETED INITIALS: _____

6. With bridge power cable overtension limit switch 2 (CTLS2) tripped, de-energize the main contactor (M). After the main contactor is off, remove the block from the cable spool and manually release the cable reel motor disc brake to relieve the cable tension and allow the limit switch to reset. After the limit switch is reset, energize the main contactor and ensure that the bridge frequency drive fault pilot light (PL3) and beacon light (BCN5) are both off. Operate the bridge in both directions and confirm normal bridge and cable reel operation.

( ) COMPLETED INITIALS: _____

7. With the bridge positioned to the south of the fixed power feed point near the runway center, manually block the cable spool to prevent rotation. After the spool is blocked, slowly operate the bridge in the north direction and verify that the bridge power cable slack limit switch (CSLS) is actuated as the cable becomes slack. Verify that bridge operation in both directions is disabled. Ensure that the bridge frequency drive fault pilot light (PL3) and beacon light (BCN5) are both illuminated.

( ) COMPLETED INITIALS: _____

8. With the bridge power cable slack limit switch (CSLS) tripped, de-energize the main contactor (M). After the main contactor is off, remove the block from the cable spool, manually release the cable reel motor disc brake, and hand rotate the cable spool to restore adequate cable tension and cause the slack limit switch to reset. After the limit switch is reset, energize the main contactor and ensure that the bridge frequency drive fault pilot light (PL3) and beacon light (BCN5) are both off. Operate the bridge in both directions and confirm normal bridge and cable reel operation.

( ) COMPLETED INITIALS: _____

P. Crane Restricted Zone Control

1. Index the crane restricted zone bypass keyswitch (KSW2) to the NORM position and the crane critical path control keyswitch (KSW3) to the DISAB position. With the bridge located near the center of the runway, position the trolley to the west of the trolley west restricted zone limit switch (TWLS) trip position. Operate the bridge in the north direction until the bridge north restricted zone limit switch (BNLS) is actuated. Confirm that bridge operation to the north is disabled while motion to the south remains unaffected and the bridge restricted movement pilot light (PL24) is illuminated. Operate the bridge in the south direction until the limit switch is reset and the pilot light is off. Verify normal bridge operation in both directions.

( ) COMPLETED INITIALS: _____

2. With the trolley positioned to the west of the trolley west restricted zone limit switch (TWLS) trip position, operate the bridge in the south direction until the bridge south restricted zone limit switch (BSLS) is actuated. Confirm that bridge operation to the south is disabled while motion to the north remains unaffected and the bridge restricted movement pilot light (PL24) is illuminated. Operate the bridge in the north direction until the limit switch is reset and the pilot light is off. Verify normal bridge operation in both directions.

( ) COMPLETED INITIALS: _____

3. Index the crane restricted zone bypass keyswitch (KSW2) to the BYP position. With the trolley positioned to the west of the trolley west restricted zone limit switch (TWLS) trip position, operate the bridge in the north direction until the bridge north restricted zone limit switch (BNLS) is actuated. Confirm that bridge operation in both directions remains unaffected.

( ) COMPLETED INITIALS: _____

4. With the crane restricted zone bypass keyswitch (KSW2) in the BYP position and the trolley positioned to the west of the trolley west restricted zone limit switch (TWLS) trip position, operate the bridge in the south direction until the bridge south restricted zone limit switch (BSLS) is actuated. Confirm that bridge operation in both directions remains unaffected.

( ) COMPLETED INITIALS: _____

5. Index the crane restricted zone bypass keyswitch (KSW2) to the NORM position. Position the trolley to the east of the trolley west restricted zone limit switch (TWLS) trip position. Operate the bridge in the north direction until the bridge north restricted zone limit switch (BNLS) is actuated. Operate the trolley in the west direction and confirm that trolley operation to the west is disabled when the trolley west restricted zone limit switch is actuated. Verify the trolley restricted movement pilot light (PL23) is illuminated and motion to the east remains unaffected. Operate the trolley in the east direction until the west restricted zone limit is reset and then bridge to the south until the north restricted zone limit is reset. Verify normal trolley operation in both directions.

( ) COMPLETED INITIALS: _____

6. With the crane restricted zone bypass keyswitch (KSW2) in the NORM position, operate the bridge in the south direction until the bridge south restricted zone limit switch (BSLS) is actuated. Operate the trolley in the west direction and confirm that trolley operation to the west is disabled when the trolley west restricted zone limit switch (TWLS) is actuated. Verify the trolley restricted movement pilot light (PL23) is illuminated and motion to the east remains unaffected. Operate the trolley in the east direction until the west restricted zone limit is reset and then bridge to the north until the south restricted zone limit is reset. Verify normal trolley operation in both directions.

( ) COMPLETED INITIALS: _____

7. Index the crane restricted zone bypass keyswitch (KSW2) to the BYP position. Operate the bridge in the north direction until the bridge north restricted zone limit switch (BNLS) is actuated. Operate the trolley in the west direction and confirm that the trolley west restricted zone limit switch (TWLS) does not disable trolley west operation when actuated. Move the trolley in the east direction until the west restricted zone limit is reset.

( ) COMPLETED INITIALS: _____

8. With the crane restricted zone bypass keyswitch (KSW2) in the BYP position, operate the bridge in the south direction until the bridge south restricted zone limit switch (BSLS) is actuated. Operate the trolley in the west direction and confirm that the trolley west restricted zone limit switch (TWLS) does not disable trolley west operation when actuated. Move the trolley in the east direction until the west restricted zone limit is reset and index the crane restricted zone bypass keyswitch (KSW2) to the NORM position.

( ) COMPLETED INITIALS: _____

Q. Crane Critical Path Control

Note: Reference ACECO drawing D-20872-0100 10 for limit switch trip locations.

1. Operate the bridge in the north direction until it is aligned with the U3 Fuel Building "L" shaped access door and the bridge critical path proximity switch (BPS) is located over the north sensor target. Ensure that the bridge critical path position pilot light (PL21) is illuminated when the proximity switch is actuated.

   ( ) COMPLETED INITIALS: _____

2. Move the trolley into the "Truck Area" position near the east end of the bridge. Ensure that the trolley critical path position pilot light (PL20) is illuminated when the trolley critical path proximity switch (TPS) is located over the sensor target. Next, move the trolley into the "Washdown Area" and then the "Pit Area" positions and confirm that the trolley critical path position pilot light is also illuminated when the trolley critical path proximity switch is located over those sensor targets. Re-position the trolley to the "Washdown Area".

   ( ) COMPLETED INITIALS: _____

3. Move the trolley into the "Truck Area" position near the east end of the bridge and ensure the trolley and bridge critical path position pilot lights (PL20, PL21) are both illuminated. Operate the main hoist in the lowering direction until the main hoist travel limit switch (HTLS) causes the hoist motion to stop at the lower limit cam setting (HTLS-D). Index the crane critical path control keyswitch (KSW3) to the ENA position and the crane restricted zone bypass keyswitch (KSW2) to the BYP position. Operate the main hoist in the raising direction and confirm that the raising motion is disabled when the main hoist critical path elevation limit switch (HTLS-C) is actuated. Measure and record the distance from the ground floor (18'-0" elevation) to the hook saddles. Ensure that the main hoist restricted movement pilot light (PL22) is illuminated and the main hoist lowering motion is unaffected. Operate the main hoist in the lowering direction until the main hoist restricted movement pilot light is off.

   Measured hook elevation: _____

   Acceptable hook elevation: 100'-10" ± 3"

   ( ) COMPLETED INITIALS: _____

4. Operate the trolley in either direction until the trolley critical path position pilot light (PL20) is off. Verify that main hoist operation in both directions is disabled when the trolley is not positioned at the Truck, Washdown, or Pit Areas. Ensure that the trolley and bridge motions are disabled in all directions and the main hoist, trolley, and bridge restricted movement pilot lights (PL22, PL23, and PL24) are illuminated. Index the crane critical path control keyswitch (KSW3) to the DISAB position, operate the trolley to the "Washdown Area" position near the west end of the bridge, and observe that the trolley critical path position pilot light is illuminated. |

( ) COMPLETED INITIALS: _____

5. Index the crane critical path control keyswitch (KSW3) to the ENA position. Operate the bridge in either direction until the bridge critical path position pilot light (PL21) is off. Verify that main hoist operation in both directions is disabled when the bridge critical path proximity switch (BPS) does not indicate that the bridge is positioned at the U3 or U4 cask handling corridor. Ensure that the trolley and bridge motions are disabled in all directions and the main hoist, trolley, and bridge restricted movement pilot lights (PL22, PL23, and PL24) are illuminated. Index the crane critical path control keyswitch (KSW3) to the DISAB position, operate the bridge back into the cask handling corridor, and observe that the bridge critical path position pilot light is illuminated. Return the crane critical path control keyswitch (KSW3) to the ENA position.

( ) COMPLETED INITIALS: _____

6. With the crane critical path control keyswitch (KSW3) in the ENA position, operate the main hoist in the raising direction until the motion is stopped by the main hoist critical path elevation limit switch (HTLS-C) and the main hoist restricted movement pilot light (PL22) is illuminated. Operate the trolley in the west direction until trolley critical path zone limit switch 2 (TCPLS2) is actuated. Ensure that the main hoist, trolley, and bridge motions are disabled in all directions and the main hoist, trolley, and bridge restricted movement pilot lights (PL22, PL23, and PL24) are illuminated. Index the crane critical path control keyswitch to the DISAB position, operate the trolley to the "Washdown Area" position, and observe that the trolley critical path position pilot light (PL20) is illuminated. |

( ) COMPLETED INITIALS: _____

7. Index the crane critical path control keyswitch (KSW3) to the ENA position. With the main hoist critical path elevation limit switch (HTLS-C) tripped and the main hoist restricted movement pilot light (PL22) illuminated, operate the trolley in the east direction from the "Pit Area" to the "Washdown Area", and then to the "Truck Area". Ensure that trolley operation is possible in both directions at reduced speed while the trolley is positioned inside the critical path zone and the main hoist has been raised to the critical path elevation limit. Confirm that the main hoist and bridge motions are disabled in all directions except when the trolley critical path position pilot light (PL20) is illuminated at the Pit, Washdown, and Truck Areas. When the trolley critical path position pilot light is illuminated, ensure that the bridge can be operated in both directions at reduced speed (45 Hz, maximum) and the main hoist can be operated in the lowering direction at normal speed. After the main hoist has been lowered, raise the hoist back to the critical path elevation.

   ( ) COMPLETED INITIALS: _____

8. With the crane critical path control keyswitch (KSW3) in the ENA position and the main hoist raised to the critical path elevation, operate the trolley in the east direction until trolley critical path zone limit switch 1 (TCPLS1) is actuated. Ensure that the main hoist, trolley, and bridge motions are disabled in all directions and the main hoist, trolley, and bridge restricted movement pilot lights (PL22, PL23, and PL24) are illuminated. Index the crane critical path control keyswitch to the DISAB position and verify normal main hoist, trolley, and bridge operation in all directions.

   ( ) COMPLETED INITIALS: _____

R. Accessory Components

1. Verify that both enclosure heater (EH) fans operate continuously when power is on and that each unit produces heat when the adjustable thermostat is set for maximum temperature. Reset each thermostat to 75°F after heater operation has been verified.

   ( ) COMPLETED INITIALS: _____

2. Verify that the strip heaters (SH) in the radio receiver and hoist speed display enclosures (ENCL4, ENCL5) are energized and produce heat when utility circuit breaker 2 (CB2) is turned on.

   ( ) COMPLETED INITIALS: _____

3. Utilizing a voltmeter, verify that 120VAC is present between terminals 802 and 811 at the terminal strip in the mainline control enclosure (ENCL1) when the main contactor (M) is de-energized. Energize the main contactor and ensure that no voltage is present between the terminal blocks.

   ( ) COMPLETED INITIALS: _____

4. Verify that each control enclosure light (EL) energizes when the respective fixture light switch is turned on.

   ( ) COMPLETED INITIALS: _____

5. Index the crane light control selector switch (SS1) to the ON position and ensure that all crane lights (CLT1 - CLT8) are energized. Index the switch to the OFF position and verify that the crane lights are de-energized.

   ( ) COMPLETED INITIALS: _____

6. Verify that each of the (2) walkway light switches (SW2A, SW2B) functions properly to control the (8) walkway lights (CL2) located along the north and south crane walkways.

   ( ) COMPLETED INITIALS: _____

7. Utilizing a voltmeter, verify that 120VAC is present at each of the (8) receptacles (REC) located along the north and south crane walkways. Ensure that the TEST and RESET pushbuttons on each GFCI receptacle function properly to remove and restore receptacle voltage.

( ) COMPLETED INITIALS: _____

8. Utilizing a voltmeter, verify that 120VAC is present at the cab accessory receptacle (REC). Ensure that the TEST and RESET pushbuttons on the GFCI receptacle function properly to remove and restore receptacle voltage.

( ) COMPLETED INITIALS: _____

9. Verify that the cab light switch (SW1) functions properly to control the ceiling mounted cab light (CL1).

( ) COMPLETED INITIALS: _____

10. Confirm proper operation of the cab air conditioning / heating unit (AC) by temporarily lowering the thermostat setpoint to cause the compressor to energize. Ensure that cool air blows from the supply vent. Next, verify heating operation by temporarily increasing the thermostat setpoint to cause the heating circuit to energize. Confirm that heated air blows from the supply vent. Reset the thermostat to a nominal setpoint and switch the unit off.

( ) COMPLETED INITIALS: _____

11. With radio control enabled and the radio transmitter powered on, index the radio transmitter analog display toggle switch to the WIND position to enable display of the wind speed value. Observe the value displayed on the wind speed indicator (WSI) located in the cab and ensure that the speed displayed on the radio transmitter closely tracks the value on the indicator. Next, adjust the alarm setpoint on the wind speed indicator to a value less than the current wind speed reading to cause the audible alarm on the wind speed indicator and the wind alarm tone on the warning horn (HORN) to sound. After alarm operation has been demonstrated, return the alarm setpoint back to the original, higher value (40 MPH).

( ) COMPLETED INITIALS: _____

TEST COMPLETION / ACCEPTANCE

ACECO Test Conductor-

Name (Print): _____

Signature: _____

Date: _____

Customer Representative-

Name (Print): _____

Signature: _____

Date: _____

Others-

Name (Print): _____

Company / Title: _____

Signature: _____

Date: _____

Name (Print): _____

Company / Title: _____

Signature: _____

Date: _____

Name (Print): _____

Company / Title: _____

Signature: _____

Date: _____

Name (Print): _____

Company / Title: _____

Signature: _____

Date: _____

TEST NOTES / COMMENTS

TEST NOTES / COMMENTS

TEST DISCREPANCY RECORD

No.	Test Step Number	Discrepancy Description	Discrepancy Resolution	Signatures / Date

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
License Amendment Request No. 202
Response to Request for Additional Information

Enclosure
Attachment 3

Site Load Test Procedure
REP-20872-014, Revision 2

AMERICAN CRANE
& EQUIPMENT CORPORATION
531 Old Swede Road, Douglassville, PA 19518
Phone 610-385-6061 Fax 610-385-1022

SITE LOAD TEST PROCEDURE

FOR

130/25T SFP CASK CRANE
TURKEY POINT NUCLEAR PLANT UNITS 3 AND 4
FLORIDA POWER & LIGHT COMPANY
CUSTOMER P.O. NO.: 00099932

BY

AMERICAN CRANE & EQUIPMENT CORPORATION
ACECO WORK ORDER NO.: 20872

SIGNATURES

REV.	ORIGINATED	DATE	CHECKED	DATE	APPROVED	DATE
0	K. Bower	10/08/09	J. Rubendall	11/11/09	J. Rubendall	11/11/09
1	K. Bower	03/25/10	J. Rubendall	03/25/10	J. Rubendall	03/25/10
2	K. Bower	08/04/10		8/4/10		8/4/10

REVISION HISTORY

REVISION	SECTION	SUMMARY
1	Various	Revised per customer comment- reference document change bars at right page margin.
2	Various	Revised per customer comment- reference document change bars at right page margin.

TABLE OF CONTENTS

TEST PARTICIPANTS

ACECO Test Conductor-

Name (Print): _____
Signature: _____
Initials: _____
Date: _____

Customer Representative-

Name (Print): _____
Signature: _____
Initials: _____
Date: _____

Others-

Name (Print): _____
Company / Title: _____
Signature: _____
Date: _____

Name (Print): _____
Company / Title: _____
Signature: _____
Date: _____

Name (Print): _____
Company / Title: _____
Signature: _____
Date: _____

Name (Print): _____
Company / Title: _____
Signature: _____
Date: _____

I. General Information

A. Description

This document is to be used in the performance and documentation of the site loaded acceptance test for the new Cask Crane supplied by American Crane and Equipment Corporation (ACECO) to the Turkey Point Nuclear Plant (PTN), operated by Florida Power & Light Company (FPL). This load test was developed in accordance with the requirements of FPL Specification No. SPEC-C-063 "Turkey Point Units 3 and 4 Fuel Cask Crane Upgrade", NUREG-0554 "Single-Failure Proof Cranes for Nuclear Power Plants", and ASME NOG-1-2004 "Rules for Construction of Overhead and Gantry Cranes". The steps of the load test do not need to be performed in the same order as they are written. Any problems encountered during the performance of the test that cannot be resolved through procedure mark-ups or comments should be recorded on the discrepancy record sheet found at the end of this document. If possible, the test conductor and customer representative should also agree to and document the resolution to the issue on the discrepancy record sheet. All test discrepancies must be resolved before the procedure is signed off as complete unless separately tracked for closure in an ACECO Nonconformance Report and FPL Action Request / Condition Report.

B. Test Participant Responsibilities

1. ACECO Test Conductor- This person will represent American Crane and Equipment Corporation during the performance of this test. Along with the customer representative, this person will direct the performance of the test and will check off and initial each step as it is completed.

2. Customer Representative- This person will represent the buyer of the equipment and should have the authority to oversee and approve the results of the site load test. This person, at his discretion, may check off and initial each step of the test as it is completed, but is required to sign at the conclusion of the test procedure to acknowledge successful completion of the test. The signature of this person after completion of the procedure will indicate that the equipment has demonstrated adequate performance and is acceptable for use.

3. Others- These people may be ACECO or customer representatives or quality assurance personnel involved in the performance of the test or observing the test to ensure that the proper procedures and documentation steps are followed. The customer representative or ACECO test conductor may include the approval signatures of these people at their discretion.

C. Required Equipment

1. ACECO will provide certified test weights and rigging components to perform loaded acceptance testing. A description of the test weights and their value (including rigging) should be recorded below.

Weight and Rigging Description / Serial Number	Procedure Step(s) Used	Weight Value (lbs)

Weight and Rigging Description / Serial Number	Procedure Step(s) Used	Weight Value (lbs)

2. A 25' tape measure to be used for load height and stopping distance measurements.

3. A stopwatch to be used to time load holding durations. (Provided by FPL- record instrument data in the table on the next page.)

4. A loadcell to determine actual weights of test loads and rigging, as necessary. (Provided by FPL if determined to be required by responsible site personnel- record instrument data in the table on the next page.)

5. A caliper to measure hook throat openings, as necessary. (Provided by FPL- record instrument data in the table on the next page.)

6. The latest revision of the electrical drawings and ACECO O&M Manual. (Note: Reference ACECO drawing D-20872-0800 for a listing of the acronyms included in this procedure.)

MEASURING AND TEST EQUIPMENT RECORD TABLE

Instrument Description	Instrument Control Number	Calibration Due Date	Procedure Step(s) Used

D. General Work Practices

1. The ACECO Test Conductor and any applicable FPL personnel will conduct a work and safety briefing prior to the start of testing each day with all personnel involved with the testing on that day.

2. FPL shall provide all required fall prevention or arrest devices that must be used when it is necessary to perform tasks in areas where the potential drop distance is greater than 6'.

3. The hazardous area below the crane should be cordoned off with caution tape and the crane inspected for any loose materials or other potential personnel safety hazards prior to the start of testing each day.

4. All ACECO and contract workers must follow the specific safety guidelines imposed by FPL procedures and personnel responsible for site industrial safety.

5. All personnel involved with crane testing must have completed the applicable site worker training program(s). The exact training requirements for a particular individual shall be established by FPL prior to the individual's arrival on site.

6. Personnel required to work inside energized electrical enclosures or near exposed, high-voltage components shall obtain necessary FPL electrical qualifications. Wire lifts and re-terminations required by the test procedure shall be performed only after all control power has been removed by placing the Main Disconnect Switch (MDS) in the OFF position.

7. FPL operations personnel shall be notified before the crane is energized to begin the performance of the test procedure.

8. All rigging will be performed in accordance with the latest revision of FPL rigging procedures. The individual(s) directing and supervising the rigging required for the load tests shall obtain necessary FPL rigging qualifications.

9. Reference the "On-Site Load Test Path" drawing provided by FPL and included as Attachment 1 to this procedure for information on the approved test load staging and transport areas. The test load(s) shall not be transported outside the FPL approved areas shown on the drawing without additional consultation/approval from responsible FPL personnel.

10. The FPL Lifted Leads Data Sheet attached to the work order shall be used to document any removal of wires or installation of jumpers required by this test procedure.

II. 100% Rated Load Test- Aux Hoist (AH)

Note: The following procedure steps can be performed from either the cab or radio transmitter, at the discretion of the ACECO Test Conductor. (Except those steps where a particular control method is specifically indicated.)

Note: When using the radio transmitter, ensure that the transmitter LED status toggle switch is indexed to the AH position.

A. Aux Hoist

1. Measure and record the distance between the punch marks across the opening on the aux hoist single prong hook. This distance will be measured a second time after the load test to detect any deformation of the hook. (Note: If the hook does not have markings that can be used to measure deformation, punch marks or scores should be made on the hook prior to testing.)

   Pre-test hook throat measurement: _____

   Post-test hook throat measurement: _____

   (Measure and record the post-test hook throat value above after completing the 125% load test- reference step III.B.1. The permanent increase in hook throat opening shall not exceed 1% of the pre-test measurement or 0.02", whichever is greater.)

   ( ) COMPLETED INITIALS: _____

2. Record the actual weight of the 100% test load and rigging (50,000 - 52,500 lbs) below and in the table on page 7 of this procedure. Press the weigh scale tare pushbutton on the radio transmitter to zero out the weight of the aux hoist lower block prior to attaching the required rigging. After the lower block weight has been zeroed, attach the rigging to the hook and move the crane into the required lift position. Index the aux hoist critical load toggle switch to the CRIT position, raise the test load a maximum of 6" off its supports and stop. Hold the load at the stopped position for 2 minutes to confirm that the hoist can maintain the load and to allow for cable and rigging stretch. After the 2-minute wait, measure and record the distance from a reference point on the load to the floor. After an additional 5 minute waiting period, re-measure from the same reference point to the floor to confirm that the load has not slipped.

   Actual lifted weight value: _____

   First load height measurement: _____

   Second load height measurement: _____

   Maximum Δ measurement allowable: 1/8"

   ( ) COMPLETED INITIALS: _____

3. With the main contactor (M) energized and the hydraulic drum brake released, manually release the aux hoist disc brake and ensure that the shoe brake alone is able to hold the load without slipping by observing the hoist motor drive shaft for rotation. Next, set the aux hoist disc brake and manually block the shoe brake open. Verify that the disc brake alone is able to hold the load without slipping by observing the hoist motor drive shaft for rotation and then return the shoe brake to normal operation.

   ( ) COMPLETED INITIALS: _____

4. Ensure the micro-speed control toggle switch is indexed to the DIS position. Raise the test load approximately 6' off its supports and stop. Lower the load at maximum speed until the load is approximately 1' from its supports and then de-energize the main contactor (M). Verify that all hoist brakes are able to stop the load without excessive drift. Record the stopping distance below.

   Measured stop distance: _____

   Maximum stop distance allowable: 3"

   ( ) COMPLETED INITIALS: _____

5. Remove field wire 62 from the numbered terminal block in the aux hoist control enclosure (ENCL2) and place a jumper between the wire and terminal block number 3 to override the aux hoist hydraulic drum brake open. Raise the test load approximately 6' off its supports and stop. Lower the load at maximum speed and manually block the aux hoist shoe brake open as the load is descending. After the shoe brake is blocked open and the load is approximately 1' from its supports, de-energize the main contactor (M). Ensure that the hoist disc brake alone is able to stop the load without excessive drift. Record the stopping distance below and then return the shoe brake to proper operation.

   Measured stop distance: _____

   Maximum stop distance allowable: 5"

   ( ) COMPLETED INITIALS: _____

6. With the aux hoist hydraulic drum brake overridden open, raise the test load approximately 6' off its supports and stop. Lower the load at maximum speed while holding the aux hoist disc brake manual release lever in the open position as the load is descending. After the disc brake release lever is held open and the load is approximately 1' from its supports, de-energize the main contactor (M). Ensure that the hoist shoe brake alone is able to stop the load without excessive drift. Record the stopping distance below and then return the disc brake to proper operation. Re-terminate field wire 62 at the numbered terminal block in the aux hoist control enclosure (ENCL2).

   Measured stop distance: _____

   Maximum stop distance allowable: 5"

   ( ) COMPLETED INITIALS: _____

7. Raise the test load approximately 6' off its supports and stop. Lower the load at maximum speed while manually holding the aux hoist disc and shoe brakes open as the load is descending. After the brakes are held open and the load is approximately 1' from its supports, de-energize the main contactor (M). Ensure that the aux hoist hydraulic drum brake alone is able to stop the load without excessive drift. Record the stopping distance below and then return the disc and shoe brakes to proper operation.

   Measured stop distance: _____

   Maximum stop distance allowable: 5"

   ( ) COMPLETED INITIALS: _____

8. With the micro-speed control toggle switch indexed to the DIS position, energize the main contactor (M) and operate the aux hoist in both directions over the longest distance possible while varying the hoist speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

9. Index the micro-speed control toggle switch to the ENA position. Operate the aux hoist in both directions while varying the hoist speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

10. Index the micro-speed control toggle switch to the DIS position. Operate the aux hoist at maximum speed (60 Hz) in each direction and record the motor current displayed on the aux hoist frequency drive (AHAFD) below.

    Raising hoist motor current: _____

    Lowering hoist motor current: _____

    Acceptable hoist motor current: ≤ 37.6 A

    ( ) COMPLETED INITIALS: _____

11. With the aux hoist critical load toggle switch indexed to the CRIT position, operate the hoist at maximum speed in each direction while observing the aux hoist drum overspeed detector (AHSD). Record the indicated maximum raising and lowering speeds in feet-per-minute below.

    Maximum raising hoist speed (AHSD): _____

    Maximum lowering hoist speed (AHSD): _____

    Acceptable maximum hoist speed: 15 ± 1.5 FPM

    ( ) COMPLETED INITIALS: _____

12. Demonstrate smooth manual hook rotation with the rated load suspended by pushing on the load to cause it to rotate.

    ( ) COMPLETED INITIALS: _____

13. Lower the test load onto its supports. Record the actual weight of the load and rigging used for the 100% load test below. With control from the radio transmitter enabled, index the micro-speed control toggle switch to the ENA position and the analog display select toggle switch to the AH position. Slowly lift the load while observing the net weight values displayed on the aux hoist weigh scale indicator (AHWSI) and radio transmitter to ensure close correlation. After the test load has been lifted and stabilized, record the displayed net weight values below.

    Actual lifted weight value: _____

    Indicated net weight- weigh scale indicator: _____

    Indicated net weight- radio transmitter: _____

    Required accuracy: ± 3000 lbs

    ( ) COMPLETED INITIALS: _____

14. Demonstrate manual load lowering through modulation of the hydraulic drum brake caliper by performing the following sequence of steps.

    a. Raise the test load a minimum of 1' off its supports and stop. De-energize the main contactor (M) and ensure that all hoist brakes are set.
    b. Close the aux hoist isolation valve (ISVA) at the hydraulic power unit by rotating the valve handle 90° in the clockwise direction.
    c. Open valves BV3 and BV4 at the aux hoist manual lowering manifold by turning the valve control knobs fully counter-clockwise.
    d. Adjust the pressure regulating valve (PR) at the aux hoist manual lowering manifold to minimum pressure by turning the valve fully counter-clockwise.
    e. Index the main and aux hoist hydraulic pump control keyswitch (KSW10) to the OVRD position to energize the pump motor and build system pressure.
    f. Ensure the hydraulic drum brake caliper remains set and then manually release the aux hoist disc and shoe brakes.
    g. Manually modulate the hydraulic brake caliper to lower the load by adjusting the position of the pressure regulating valve (PR) while pulling out on the manual control valve (MDV). Turn the pressure regulating valve clockwise to increase pressure to the caliper and counter-clockwise to decrease pressure. Releasing the manual control valve will cause the caliper to immediately set. Observe the drum speed indication on the aux hoist drum overspeed detector (AHSD) as the load descends to ensure that the lowering speed does not exceed 15 FPM.
    h. After the test load has been lowered onto its supports, restore the aux hoist disc and shoe brakes to their set positions.
    i. Index the main and aux hoist hydraulic pump control keyswitch (KSW10) to the NORM position.
    j. Return all control valves to their original positions as follows. Open the aux hoist isolation valve (ISVA) by rotating the handle 90° counter-clockwise. Close valves BV3 and BV4 at the aux hoist manual lowering manifold by turning the control knobs fully clockwise.
    k. Verify normal aux hoist hydraulic drum brake system performance by cycling the main contactor (M) on and off while observing the brake caliper for proper operation.

( ) COMPLETED INITIALS: _____

III. 125% Rated Load Test- Aux Hoist

Note: The following procedure steps can be performed from either the cab console or radio transmitter, at the discretion of the ACECO Test Conductor. (Except those steps where a particular control method is specifically indicated.)

Note: When using the radio transmitter, ensure that the transmitter LED status toggle switch is indexed to the AH position.

A. Aux Hoist

1. Record the actual weight of the test load and rigging (62,500 - 65,625 lbs) below and in the table on page 7 of this procedure. With control from the radio transmitter enabled, index the micro-speed control toggle switch to the ENA position. Slowly raise the test load and verify that the aux hoist overweight limit switch (AHWLS) disables the hoist raising motion before the test load has been fully lifted off its supports. Ensure that the aux hoist overweight fault pilot light (PL9), radio receiver overweight fault LED, and aux hoist general fault beacon light (BCN3) are all illuminated. Confirm that hoist operation in the lowering direction remains unaffected. Index the aux hoist overweight limit bypass keyswitch (KSW17) from NORM to BYP. Verify that hoist operation in the raising direction has been restored.

   Actual lifted weight value: _____

   ( ) COMPLETED INITIALS: _____

2. With the aux hoist overweight limit bypass keyswitch (KSW17) in the BYP position, raise the test load a maximum of 6" off its supports and stop. Hold the load at the stopped position for 2 minutes to confirm that the hoist can maintain the load and to allow for cable and rigging stretch. After the 2-minute wait, measure and record the distance from a reference point on the load to the floor. After an additional 5 minute waiting period, re-measure from the same reference point to the floor to confirm that the load has not slipped.

   First load height measurement: _____

   Second load height measurement: _____

   Maximum Δ measurement allowable: 1/8"

   ( ) COMPLETED INITIALS: _____

3. With the main contactor (M) energized and the hydraulic drum brake released, manually release the aux hoist disc brake and ensure that the shoe brake alone is able to hold the load without slipping. Next, set the aux hoist disc brake and then manually block the shoe brake open. Verify that the disc brake alone is able to hold the load without slipping and then return the shoe brake to normal operation.

   ( ) COMPLETED INITIALS: _____

4. De-energize the main contactor (M) and ensure the aux hoist hydraulic drum brake is set. Manually release the aux hoist disc and shoe brakes and ensure that the drum brake alone is able to hold the load without slipping. Return the disc and shoe brakes to normal operation.

   ( ) COMPLETED INITIALS: _____

5. Index the micro-speed control toggle switch to the DIS position. Raise the test load approximately 6' off its supports and stop. Lower the load at maximum speed until the load is approximately 1' from its supports and then de-energize the main contactor (M). Ensure that all hoist brakes are able to stop the load without excessive drift. Record the stopping distance below (for information only).

   Measured stop distance: _____

   ( ) COMPLETED INITIALS: _____

6. With the micro-speed control toggle switch indexed to the DIS position, energize the main contactor (M) and operate the hoist in both directions while varying the hoist speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

7. With the micro-speed control toggle switch indexed to the DIS position, operate the hoist at maximum speed (60 Hz) in each direction and record the motor current displayed on the aux hoist frequency drive (AHAFD) below. (Motor current may exceed nameplate value.)

   Raising hoist motor current: _____

   Lowering hoist motor current: _____

   Hoist motor nameplate current: 37.6 A

   ( ) COMPLETED INITIALS: _____

B. Post 125% Rated Load Test

1. After completing the above aux hoist test steps, lower and remove the 125% test load and then measure and record the hook throat opening in step II.A.1 of the 100% load test. Return the aux hoist overweight limit bypass keyswitch (KSW17) to the NORM position.

( ) COMPLETED INITIALS: _____

2. Perform a visual inspection of the trolley. Inspect the trolley load bearing members at the aux hoist machinery for any signs of cracked welds. Also inspect the hoisting machinery, lower block, and hook for any signs of damage.

( ) COMPLETED INITIALS: _____

IV. 100% Rated Load Test- Main Hoist (MH)

Note: The following procedure steps can be performed from either the cab or radio transmitter, at the discretion of the ACECO Test Conductor. (Except those steps where a particular control method is specifically indicated.)

Note: When using the radio transmitter, ensure that the transmitter LED status toggle switch is indexed to the MH position.

A. Main Hoist

1. Measure and record the distance between punch marks across each hook saddle. These distances will be measured a second time after the load test to detect any deformation of the hook. (Note: If the hook does not have markings that can be used to measure deformation, punch marks or scores should be made on the hook prior to testing.)

   Pre-test hook saddle 1 measurement: _____

   Pre-test hook saddle 2 measurement: _____

   Post-test hook saddle 1 measurement: _____

   Post-test hook saddle 2 measurement: _____

   (Measure and record the post-test values above after completing the 125% load test- reference step V.D.1. The permanent increase in the opening shall not exceed 1% of the pre-test measurement or 0.02", whichever is greater.)

   ( ) COMPLETED INITIALS: _____

2. Record the actual weight of the 100% test load and rigging (260,000 - 273,000 lbs) below and in the table on page 7 of this procedure. Press the weigh scale tare pushbutton on the radio transmitter to zero out the weight of the main hoist lower block prior to attaching the required rigging. After the lower block weight has been zeroed, attach the rigging to the hook and move the crane into the required lift position. Index the main hoist critical load toggle switch to the CRIT position, raise the test load a maximum of 6" off its supports and stop. Hold the load at the stopped position for 2 minutes to confirm that the hoist can maintain the load and to allow for cable and rigging stretch. After the 2-minute wait, measure and record the distance from a reference point on the load to the floor. After an additional 5 minute waiting period, re-measure from the same reference point to the floor to confirm that the load has not slipped.

   Actual lifted weight value: _____

   First load height measurement: _____

   Second load height measurement: _____

   Maximum Δ measurement allowable: 1/8"

   ( ) COMPLETED INITIALS: _____

3. With the main contactor (M) energized and the hydraulic drum brakes released, manually block the east main hoist shoe brake open and ensure that the west shoe brake alone is able to hold the load without slipping. Next, set the east shoe brake and manually block the west shoe brake open. Verify that the east shoe brake alone is able to hold the load without slipping and then return the west shoe brake to normal operation.

   ( ) COMPLETED INITIALS: _____

4. Ensure the micro-speed control toggle switch is indexed to the DIS position. Raise the test load approximately 4' off its supports and stop. Lower the load at maximum speed until the load is approximately 1' from its supports and then de-energize the main contactor (M). Verify that all hoist brakes are able to stop the load without excessive drift. Record the stopping distance below.

   Measured stop distance: _____

   Maximum stop distance allowable: 3"

   ( ) COMPLETED INITIALS: _____

5. Remove field wire 60 from the numbered terminal block in the main hoist control enclosure (ENCL1) and place a jumper between the wire and terminal block number 3 to override the main hoist hydraulic drum brakes open. Raise the test load approximately 4' off its supports and stop. Lower the load at maximum speed and manually block the west main hoist shoe brake open as the load is descending. After the shoe brake is blocked open and the load is approximately 1' from its supports, de-energize the main contactor (M). Ensure that the east hoist shoe brake alone is able to stop the load without excessive drift. Record the stopping distance below and then return the west shoe brake to proper operation.

   Measured stop distance: _____

   Maximum stop distance allowable: 5"

   ( ) COMPLETED INITIALS: _____

6. With the main hoist hydraulic drum brakes overridden open, raise the test load approximately 4' off its supports and stop. Lower the load at maximum speed and manually block the east main hoist shoe brake open as the load is descending. After the shoe brake is blocked open and the load is approximately 1' from its supports, de-energize the main contactor (M). Ensure that the west hoist shoe brake alone is able to stop the load without excessive drift. Record the stopping distance below and then return the east shoe brake to proper operation. Re-terminate field wire 60 at the numbered terminal block in the main hoist control enclosure (ENCL1).

   Measured stop distance: _____

   Maximum stop distance allowable: 5"

   ( ) COMPLETED INITIALS: _____

7. Raise the test load approximately 4' off its supports and stop. Lower the load at maximum speed and manually block both shoe brakes open as the load is descending. After the shoe brakes are blocked open and the load is approximately 1' from its supports, de-energize the main contactor (M). Ensure that the hoist hydraulic drum brakes alone are able to stop the load without excessive drift. Record the stopping distance below and then return the shoe brakes to proper operation.

   Measured stop distance: _____

   Maximum stop distance allowable: 5"

   ( ) COMPLETED INITIALS: _____

8. With the micro-speed control toggle switch indexed to the DIS position, energize the main contactor (M) and operate the main hoist in both directions over the longest distance possible while varying the hoist speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

9. Index the micro-speed control toggle switch to the ENA position. Operate the main hoist in both directions while varying the hoist speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

10. Index the micro-speed control toggle switch to the DIS position. Operate the main hoist at maximum speed (60 Hz) in each direction and record the motor current displayed on the main hoist frequency drive (HAFD) below.

    Raising hoist motor current: _____

    Lowering hoist motor current: _____

    Acceptable hoist motor current: ≤ 68 A

    ( ) COMPLETED INITIALS: _____

11. With the main hoist critical load toggle switch indexed to the CRIT position, operate the main hoist at maximum speed in each direction while observing the main hoist drum overspeed detectors (HSD1, HSD2). Record the indicated maximum raising and lowering speeds in feet-per-minute below.

    Maximum raising hoist speed (HSD1): _____

    Maximum raising hoist speed (HSD2): _____

    Maximum lowering hoist speed (HSD1): _____

    Maximum lowering hoist speed (HSD2): _____

    Acceptable maximum hoist speed: 5 ± 0.5 FPM

    ( ) COMPLETED INITIALS: _____

12. Demonstrate smooth manual hook rotation with the rated load suspended by pushing on the load to cause it to rotate.

    ( ) COMPLETED INITIALS: _____

13. Lower the test load onto its supports. Record the actual weight of the load and rigging used for the 100% load test below. With control from the radio transmitter enabled, index the micro-speed control toggle switch to the ENA position and the analog display select toggle switch to the MH position. Slowly lift the load while observing the net weight values displayed on the main hoist weigh scale indicator (HWSI) and radio transmitter to ensure close correlation. After the test load has been lifted and stabilized, record the displayed net weight values below.

    Actual lifted weight value: _____

    Indicated net weight- weigh scale indicator: _____

    Indicated net weight- radio transmitter: _____

    Required accuracy: ± 5000 lbs

    ( ) COMPLETED INITIALS: _____

14. Demonstrate manual load lowering through modulation of the hydraulic drum brake calipers by performing the following sequence of steps.

    a. Raise the test load a minimum of 1' off its supports and stop. De-energize the main contactor (M) and ensure that all hoist brakes are set.
    b. Close the main hoist isolation valve (ISVM) at the hydraulic power unit by rotating the valve handle 90° in the clockwise direction.
    c. Open valves BV1 and BV2 at the main hoist manual lowering manifold by turning the valve control knobs fully counter-clockwise.
    d. Adjust the pressure regulating valve (PR) at the main hoist manual lowering manifold to minimum pressure by turning the valve fully counter-clockwise.
    e. Index the main and aux hoist hydraulic pump control keyswitch (KSW10) to the OVRD position to energize the pump motor and build system pressure.
    f. Ensure the hydraulic drum brake calipers remain set and then manually block both main hoist shoe brakes open.
    g. Manually modulate the hydraulic brake calipers to lower the load by adjusting the position of the pressure regulating valve (PR) while pulling out on the manual control valve (MDV). Turn the pressure regulating valve clockwise to increase pressure to the calipers and counter-clockwise to decrease pressure. Releasing the manual control valve will cause the calipers to immediately set. Observe the drum speed indication on the main hoist drum overspeed detectors (HSD1, HSD2) as the load descends to ensure that the lowering speed does not exceed 5 FPM.
    h. After the test load has been lowered onto its supports, restore the main hoist shoe brakes to their set positions.
    i. Index the main and aux hoist hydraulic pump control keyswitch (KSW10) to the NORM position.
    j. Return all control valves to their original positions as follows. Open the main hoist isolation valve (ISVM) by rotating the handle 90° counter-clockwise. Close valves BV1 and BV2 at the main hoist manual lowering manifold by turning the control knobs fully clockwise.
    k. Verify normal main hoist hydraulic drum brake system performance by cycling the main contactor (M) on and off while observing the brake calipers for proper operation.

( ) COMPLETED INITIALS: _____

B. Trolley

Note: Refer to Attachment 1 for permitted trolley and bridge positions.

1. Energize the main contactor (M) and lift the 100% test load. With the micro-speed control toggle switch indexed to the DIS position, operate the trolley in both directions over the longest distance permitted in accordance with Attachment 1 while varying the trolley speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

2. Index the micro-speed control toggle switch to the ENA position. Operate the trolley in both directions while varying the trolley speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

3. With the micro-speed control toggle switch indexed to the ENA position, operate the trolley at maximum speed (15 Hz) and then de-energize the main contactor (M). Verify that the motor disc brakes are able to stop the motion of the trolley.

   ( ) COMPLETED INITIALS: _____

4. Index the micro-speed control toggle switch to the DIS position. Operate the trolley at maximum speed (or as fast as safely possible in the available operating area) in each direction and record the motor current displayed on the trolley frequency drive (TAFD) below.

   East trolley motor current: _____

   West trolley motor current: _____

   Acceptable trolley motor current: ≤ 8.6 A

   ( ) COMPLETED INITIALS: _____

C. Bridge

Note: Refer to Attachment 1 for permitted trolley and bridge positions.

1. Energize the main contactor (M) and lift the 100% test load. Index the micro-speed control toggle switch indexed to the DIS position. Position the trolley as close as permitted to the east end of travel and operate the bridge in the north direction over the longest distance permitted in accordance with Attachment 1 while varying the bridge speed throughout the control range to verify smooth operation and no motor overheating. Move the trolley as close as permitted to the west end of travel and operate the bridge in the south direction over the longest distance permitted while varying the bridge speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

2. Index the micro-speed control toggle switch indexed to the ENA position. With bridge and trolley movements limited in accordance with Attachment 1, position the trolley as close as permitted to its extreme east and west ends of travel and then operate the bridge in both directions as permitted while varying the bridge speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

3. With the micro-speed control toggle switch indexed to the ENA position, operate the bridge at maximum speed (15 Hz) and then de-energize the main contactor (M). Verify that the motor disc brakes are able to stop the motion of the bridge.

   ( ) COMPLETED INITIALS: _____

4. Index the micro-speed control toggle switch to the DIS position. Operate the bridge at maximum speed (or as fast as safely possible in the available operating area) in each direction and record the motor current displayed on the bridge frequency drive (BAFD) below.

   North bridge motor current: _____

   South bridge motor current: _____

   Acceptable bridge motor current: ≤ 32.8 A

   ( ) COMPLETED INITIALS: _____

V. 125% Rated Load Test- Main Hoist

Note: The following procedure steps can be performed from either the cab console or radio transmitter, at the discretion of the ACECO Test Conductor. (Except those steps where a particular control method is specifically indicated.)

Note: When using the radio transmitter, ensure that the transmitter LED status toggle switch is indexed to the MH position.

A. Main Hoist

1. Place a jumper between terminals 34 and 35 at the wiring junction box on the trolley to bypass main hoist overweight limit switch 2 (HWLS2). Record the actual weight of the test load and rigging (325,000 - 341,250 lbs) below and in the table on page 7 of this procedure. With control from the radio transmitter enabled, index the micro-speed control toggle switch to the ENA position. Slowly raise the test load and verify that main hoist overweight limit switch 1 (HWLS1) disables the hoist raising motion before the test load has been fully lifted off its supports. Ensure that the main hoist overweight fault pilot light (PL8), radio receiver overweight fault LED, and main hoist general fault beacon light (BCN2) are all illuminated. Confirm that hoist operation in the lowering direction remains unaffected and lower the load onto its supports. Remove the jumper wire between terminals 34 and 35.

   Lifted weight value: _____

   ( ) COMPLETED INITIALS: _____

2. Place a jumper between terminals 3 and 34 at the wiring junction box on the trolley to bypass main hoist overweight limit switch 1 (HWLS1). Slowly raise the test load and verify that main hoist overweight limit switch 2 (HWLS2) disables the hoist raising motion before the test load has been fully lifted off its supports. Ensure that the main hoist overweight fault pilot light (PL8), radio receiver overweight fault LED, and main hoist general fault beacon light (BCN2) are all illuminated. Confirm that hoist operation in the lowering direction remains unaffected. Index the main hoist overweight limit bypass keyswitch (KSW15) from NORM to BYP. Verify that hoist operation in the raising direction has been restored.

   ( ) COMPLETED INITIALS: _____

3. With the main hoist overweight limit bypass keyswitch (KSW15) in the BYP position, raise the test load a maximum of 6" off its supports and stop. Hold the load at the stopped position for 2 minutes to confirm that the hoist can maintain the load and to allow for cable and rigging stretch. After the 2-minute wait, measure and record the distance from a reference point on the load to the floor. After an additional 5 minute waiting period, re-measure from the same reference point to the floor to confirm that the load has not slipped.

   First load height measurement: _____

   Second load height measurement: _____

   Maximum Δ measurement allowable: 1/8"

   ( ) COMPLETED INITIALS: _____

4. With the main contactor (M) energized and the hydraulic drum brakes released, manually block the east shoe brake open and ensure that the west shoe brake alone is able to hold the load without slipping. Next, set the east shoe brake and then manually block the west shoe brake open. Verify that the east shoe brake alone is able to hold the load without slipping and then return the west shoe brake to normal operation.

   ( ) COMPLETED INITIALS: _____

5. De-energize the main contactor (M) and ensure the main hoist hydraulic drum brakes are set. Manually block both main hoist shoe brakes open and ensure the drum brakes alone are able to hold the load without slipping. Return the shoe brakes to normal operation.

   ( ) COMPLETED INITIALS: _____

6. Index the micro-speed control toggle switch to the DIS position. Raise the test load approximately 4' off its supports and stop. Lower the load at maximum speed until the load is approximately 1' from its supports and then de-energize the main contactor (M). Ensure that all hoist brakes are able to stop the load without excessive drift. Record the stopping distance below (for information only).

   Measured stop distance: _____

   ( ) COMPLETED INITIALS: _____

7. With the micro-speed control toggle switch indexed to the DIS position, energize the main contactor (M) and operate the hoist in both directions while varying the hoist speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

8. With the micro-speed control toggle switch indexed to the DIS position, operate the hoist at maximum speed (60 Hz) in each direction and record the motor current displayed on the main hoist frequency drive (HAFD) below. (Motor current may exceed nameplate value.)

   Raising hoist motor current: _____

   Lowering hoist motor current: _____

   Hoist motor nameplate current: 68 A

   ( ) COMPLETED INITIALS: _____

B. Trolley

Note: Refer to Attachment 1 for permitted trolley and bridge positions.

1. Energize the main contactor (M) and lift the 125% test load. With the micro-speed control toggle switch indexed to the DIS position, operate the trolley in both directions while varying the trolley speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

2. Index the micro-speed control toggle switch to the ENA position. Operate the trolley in both directions while varying the trolley speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS: _____

3. With the micro-speed control toggle switch in the ENA position, operate the trolley at maximum speed (15 Hz) and then de-energize the main contactor (M). Verify that the motor disc brakes are able to stop the motion of the trolley.

   ( ) COMPLETED INITIALS: _____

4. Index the micro-speed control toggle switch to the DIS position. Operate the trolley at maximum speed (or as fast as safely possible in the available operating area) in each direction and record the motor current displayed on the trolley frequency drive (TAFD) below. (Motor current may exceed nameplate value.)

   East trolley motor current: _____

   West trolley motor current: _____

   Trolley motor nameplate current: 8.6 A

   ( ) COMPLETED INITIALS: _____

C. Bridge

Note: Refer to Attachment 1 for permitted trolley and bridge positions.

1. Energize the main contactor (M) and lift the 125% test load. Index the micro-speed control toggle switch indexed to the DIS position. Position the trolley as close as permitted to the east end of travel and operate the bridge in the north direction over the longest distance permitted in accordance with Attachment 1 while varying the bridge speed throughout the control range to verify smooth operation and no motor overheating. Move the trolley as close as permitted to the west end of travel and operate the bridge in the south direction over the longest distance permitted while varying the bridge speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS:_____

2. Index the micro-speed control toggle switch indexed to the ENA position. With bridge and trolley movements limited in accordance with Attachment 1, position the trolley as close as permitted to its extreme east and west ends of travel and then operate the bridge in both directions as permitted while varying the bridge speed throughout the control range to verify smooth operation and no motor overheating.

   ( ) COMPLETED INITIALS:_____

3. With the micro-speed control toggle switch indexed to the ENA position, operate the bridge at maximum speed (15 Hz) and then de-energize the main contactor (M). Verify that the motor disc brakes are able to stop the motion of the bridge.

   ( ) COMPLETED INITIALS:_____

4. Index the micro-speed control toggle switch to the DIS position. Operate the bridge at maximum speed (or as fast as safely possible in the available operating area) in each direction and record the motor current displayed on the bridge frequency drive (BAFD) below. (Motor current may exceed nameplate value.)

   North bridge motor current: _____

   South bridge motor current: _____

   Bridge motor nameplate current: 32.8 A

   ( ) COMPLETED INITIALS: _____

D. Post 125% Rated Load Test

1. After completing the above test steps, lower and remove the test load and then measure and record the distance across each hook saddle in step IV.A.1 of the 100% load test. Return the main hoist overweight limit bypass keyswitch (KSW15) to the NORM position and remove the jumper wire between terminals 3 and 34.

   ( ) COMPLETED INITIALS: _____

2. Perform a visual inspection of the crane. Inspect the trolley and bridge load bearing members for any signs of cracked welds. Also inspect the hoisting machinery, lower block, and hook for any signs of damage.

   ( ) COMPLETED INITIALS: _____

TEST COMPLETION / ACCEPTANCE

ACECO Test Conductor-

Name (Print): _____

Signature: _____

Date: _____

Customer Representative-

Name (Print): _____

Signature: _____

Date: _____

Others-

Name (Print): _____

Company / Title: _____

Signature: _____

Date: _____

Name (Print): _____

Company / Title: _____

Signature: _____

Date: _____

Name (Print): _____

Company / Title: _____

Signature: _____

Date: _____

Name (Print): _____

Company / Title: _____

Signature: _____

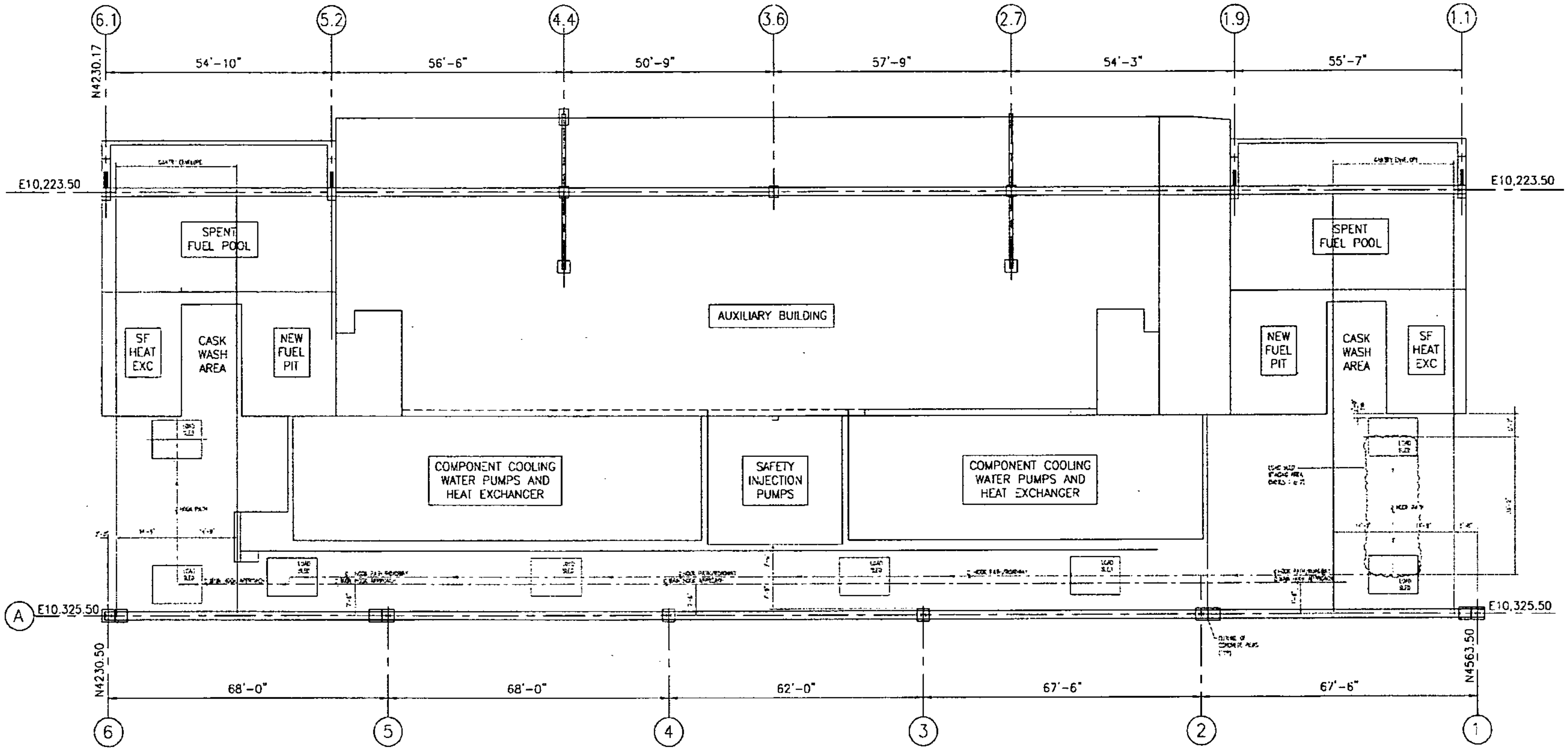
Date: _____

TEST NOTES / COMMENTS

TEST NOTES / COMMENTS

TEST DISCREPANCY RECORD

No.	Test Step Number	Discrepancy Description	Discrepancy Resolution	Signatures / Date



ON-SITE LOAD TEST PATH

NOTES:

1. LOAD SLED STAGING AREA TO BE USED FOR LOADING/UNLOADING LOAD SLED AND FOR PERFORMING STATIONARY (IN-PLACE) LOAD TESTS.
2. REFER TO [illegible] FOR [illegible] REQUIREMENTS AT THE LOAD SLED STAGING AREA AND LOAD PATH PROTECTION REQUIREMENTS DURING CONDUCT OF THE LOAD TEST.
3. LOAD SLED TO FOLLOW PATH INDICATED.