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LIGHT DUTY UTILITY ARM WALKDOWN REPORT

JL Smalley

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Abstract: This report presents the details of the walkdown and subsequent revisions of selected Light Duty Utility Arm drawings.

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LIGHT DUTY UTILITY ARM
WALKDOWN REPORT

J. L. Smalley

Prepared for Characterization Engineering

August 1998

COGEMA Engineering Corporation

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LIGHT DUTY UTILITY ARM WALKDOWN REPORT

1.0 OBJECTIVE

This document is a report of the Light Duty Utility Arm (LDUA) drawing walkdown. The purpose of this walkdown was to validate the essential configuration of the LDUA in preparation of deploying the equipment in a Hanford waste tank.

2.0 BACKGROUND

The LDUA system has, over the course of its development, caused the generation of a considerable number of design drawings. The number of drawings is estimated to be well over 1000. A large number consist of vendor type drawings, furnished by both Pacific Northwest National Laboratory (PNNL) and SPAR Aerospace Limited (SPAR). A smaller number, approximately 200, are H-6 type drawing sheets in the Project Hanford Management Contract (PHMC) document control system. A preliminary inspection of the drawings showed that the physical configuration of the LDUA did not match the documented configuration. As a result of these findings, a scoping walkdown of 20 critical drawing sheets was performed to determine if a problem existed in configuration management of the LDUA system. The results of this activity showed that 18 of the 20 drawing sheets were found to contain errors or omissions of varying concern. Given this, Characterization Engineering determined that a walkdown of the drawings necessary and sufficient to enable safe operation and maintenance of the LDUA should be performed. A review team was assembled to perform a review of all of the drawings and determine the set which would need to be verified through an engineering walkdown. The team determined that approximately 150 H-6 type drawing sheets would need to be verified, 12 SPAR/PNNL drawing sheets would need to be verified and converted to H-6 drawings, and three to six new drawings would be created (see Appendix A). This report documents the results of that walkdown.

3.0 WALKDOWN SCOPE

The scope of this walkdown was to verify the design configuration as depicted on the drawings which were identified in Appendix A. The walkdown was to be conducted and documented per the applicable requirements of HNF-IP-0842 Vol. IV, Sec. 3.13 (Performing Walkdowns). The minimum documentation for this activity was a walkdown checklist (list of drawings to be

verified), summary status listing of items to be corrected by Engineering Change Notice (ECN), and a drawing file consisting of the redlined drawing sheets. All of this documentation was to be assembled in the approved and issued walkdown report. In addition to performing the actual walkdown, the team was tasked to generate ECNs and new drawings as necessary to correct the configuration documentation.

4.0 WALKDOWN DESCRIPTION

The existing H-6 and SPAR/PNNL drawings that were evaluated are shown in Appendix B. An attempt was made to visually verify the drawing configuration against the physical configuration of the LDUA system. However, the complexity of the LDUA system did not make it possible to completely verify every attribute of the design configuration. The starting assumption of this walkdown was that it was a field verification of hardware. That is to say, in all cases, discrepancies between the physical hardware and the documented configuration were errors in the configuration, not the hardware. The basis for this assumption was that the hardware has been tested and certified to work as intended. This assumption will be validated by having a vendor technical authority (PNNL) review ECNs written to accomplish the drawing changes.

Discrepancies between the design configuration and the physical configuration were documented using redline markups. Once a drawing sheet had been redlined, a summary of the findings was generated. This summary included a brief discussion of the items which needed correction, all items which could not be verified, and any comments or open issues which could not be resolved as part of the walkdown.

4.1 WALKDOWN TEAM

The walkdown team for this effort consisted of the following members:

Walkdown Team Lead	J. L. Smalley
Walkdown Team Members	B. R. Johns (Electrical)
	J. K. Bajwa (Electrical)
	G. W. Wilson (Mechanical)
	R. L. Miller (Mechanical)
	A. McNichols (Mechanical)
	J. L. Smalley (Mechanical)

4.2 WALKDOWN PROCEDURE

- 1) Obtain a current 11x17 copy of the drawing and any outstanding ECNs.
- 2) In teams of two, visually inspect the applicable LDUA hardware by discipline. Attempt to verify all drawing attributes. Items that require more than minor disassembly shall not be verified.
- 3) When discrepancies are found between the LDUA hardware configuration and the drawing configuration, redline the drawing with the correct hardware information. The redlines shall contain enough information so that a revised drawing can be generated.
- 4) After the drawing has been redlined, complete a summary of the walkdown findings. This summary shall include a brief discussion of the drawing revisions required and a description of all items that could not be verified (e.g., raw stock material designations, etc.).
- 5) Return the redlined markups and the walkdown summary to the walkdown team lead.

5.0 WALKDOWN RESOLUTION

The walkdown procedure requires that discrepancies found during the walkdown be documented using open item data sheets which provides a mechanism for resolving the discrepancies. For this walkdown, open item data sheets were not used to document each one of the discrepancies found since it was a basic assumption that in all cases discrepancies between the hardware and documented configuration were due to errors in the documentation and the resolution was to correct the documentation. Open item data sheets were used to document findings that were believed to require resolution. These sheets may be found in section 8 of this report.

Since the resolution to each discrepancy was to correct the drawing, the original redlined markups were used to generate direct revision ECNs per HNF-PRO-440. Once the redlines were incorporated into the drawings, the revised drawings were reviewed by the walkdown team to verify that the intent of the redlines had been incorporated. After this step was completed, the direct revision ECNs were sent out for review and approval. As a validation to the basic assumption that the drawings were in error, each of the ECNs were reviewed and signed by a vendor technical authority (PNNL) verifying that the change was indeed a documentation error and the configuration of the hardware was correct.

6.0 SUMMARY OF WALKDOWN

This section contains a summary listing of the walkdown findings by drawing and sheet number. Appendix A contains the walkdown checklist. Copies of the actual redline markups are shown in Appendix C. As a result of this activity, the following direct revision ECNs were generated: 648054, 648055, 648056, 648057, 648058, 648059, 648061, 649217, 649218, 649219, 649220, and 649221.

6.1 SUMMARY OF WALKDOWN FOR H-6-14055 SHEET 1: LDUA SYSTEM BLOCK DIAGRAM

AS FOUND:

This drawing did not contain drawing numbers for the following components which are shown on the face of the drawing:

- PURGE AIR SUPPLY SYSTEM
- POWER DISTRIBUTION SKID
- POWER INTERFACE MODULE
- AT-TANK INSTRUMENT ENCLOSURE
- DECON WATER SUPPLY SYSTEM
- OPERATIONS CONTROL TRAILER
- GRIPPER END EFFECTOR
- HIGH RESOLUTION STEREO VIDEO SYSTEM
- EXTENDED REACH END EFFECTOR
- HYDRAULIC OUTRIGGERS

The drawing did not depict any of the drawings as essential, which was an additional requirement placed on this drawing by the Design Authority. Two of the pressure sensor component numbers were in error, they were called out as A2A5 but are really A2A6. The mast housing adapter and TRIC high efficiency particulate air filter were not shown.

RESOLUTION:

The drawing numbers were added for the equipment mentioned above. In addition, the words "ESSENTIAL DRAWING" were added to the hydraulic outriggers, purge air supply system, power distribution skid, power interface module, at-tank instrument enclosure, and operations control trailer. The HEPA filter inside of the TRIC and the mast housing adapter were added to the drawing. The component numbers for the two purge pressure sensors were corrected and two general notes were added. The first general note stated that "For LDUA system power distribution one line diagram see essential drawing H-6-14109". The second general note states

"Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The information given for the vendor name, part number, and function of the safety related equipment and the system organization chart were not verified.

6.2 SUMMARY OF WALKDOWN FOR H-6-14099: LDUA PURGE AIR SUPPLY ASSEMBLY

6.2.1 H-6-14099 Sheet 1

AS FOUND:

The manufacturer and model number of the air compressor were incorrectly identified as a POWEREX 0L200P. The correct manufacturer and model number is IWATA Air Compressor Mfg. Co. 0L-265P. The pressure gauge range was not identified on the drawing. The manufacturer of the NEMA 4 enclosure was not indicated but the part number was. The manufacturer is Hoffman. The air receiver manufacturer was identified. The name tag for the assembly was shown with the detail necessary to fabricate.

RESOLUTION:

The drawing was revised to reflect the correct manufacturer and model number for the air compressor. In addition, the following items were added to the face of the drawing; the manufacturer of the NEMA 4 enclosure, the manufacturer of the air receiver, the pressure range of the pressure gauge, and a detail of the name plate that included drawing number, system name, system number, and part serial number. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The information given for the motor pulley, plug valve, LOAD GENI, heat tape, and belt guard could not be verified. Manufacturer information for the drive belt, electrical switches, two way valve, pressure gauge, and heater light could not be found. Details of the support brackets for the air dryer and NEMA 4 enclosure are not given on this drawing. It is not necessary to show all of these items since this is identified as a "specification control drawing" and it is assumed that enough information exists in that specification to procure another air supply if necessary.

6.2.2 H-6-14099 Sheet 2

AS FOUND:

The hour meter was not wired as indicated on the drawing. The hour meter is activated by the operation of the air compressor not just turning the system power on as indicated by the electrical schematic.

RESOLUTION:

The hour meter was shown wired to the correct contactor terminals so that the hour meter would operate only when the compressor is operating.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.3 SUMMARY OF WALKDOWN FOR H-6-14100: LDUA OPERATIONS CONTROL TRAILER HANFORD

6.3.1 H-6-14100 Sheet 1

AS FOUND:

The only component identified on this drawing sheet was the motor control center but other associated components were detailed.

RESOLUTION:

Added call outs for Main Breaker Panel, Primary Connector 480 VAC 3 PH, Instrument Power, Utility Power, and GFCI which are shown in the curbside view. Also added the trailer HO number to left-side view. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.3.2 H-6-14100 Sheet 2

AS FOUND:

There was no indication of voltage or phase for the main power disconnects.

RESOLUTION:

Added voltage and phase callouts for the main circuit breaker, service head, 60 amp disconnect, 50 amp disconnect, and motor control center.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.3.3 H-6-14100 Sheet 3

AS FOUND:

One light assembly was not shown in the plenum view.

RESOLUTION:

Added the overhead light that was not shown on Plenum view.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.3.4 H-6-14100 Sheet 4

AS FOUND:

The drawing indicated a fresh air fan on the wiring diagram that did not exist.. Switch PP2-2 S1 was shown in the wrong location. The circuit breaker amp values on power panel #1 for circuits #13 and #14 were reversed and the description title for circuit #13 was different than specified in the field. The circuit breaker amp values on power panel #2 for spare circuits #18-#21 were not

shown and the circuit breaker amp values for circuits #28/29 and #30/31 were incorrectly specified as 20 amps when they were of 30 amps.

RESOLUTION:

The drawing was corrected to indicate the correct circuit breaker amp values and labels. In addition, the fresh air fan call out was removed and the switch location moved to reflect field conditions.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.3.5 H-6-14100 Sheet 5

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.3.6 H-6-14100 Sheet 6

AS FOUND:

The keypad access to the trailer was not shown on this drawing and the reviewers could not verify the part number of the fiber optic module.

RESOLUTION:

Added the keypad access panel to the partition view of the drawing and (Ref 4100A30A1, 4100A30A2) under Fiber Optic Module in Interface Panel view of the drawing.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.3.7 H-6-14100 Sheet 7

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

**6.4 SUMMARY OF WALKDOWN FOR H-6-14101 SHEET 1: WIRING DIAGRAM,
AIR CONDITIONING CONTROL & POWER, HANFORD**

AS FOUND:

A partial parts list was added to this wiring diagram drawing without specifically identified parts in the body of the drawing. The formatting of the labels for the K103 relay was not clear due to positioning of the words.

RESOLUTION:

Removed the parts list because it was only a partial parts list and the complete information to fabricate this assembly is given on the associated assembly drawing. In addition, reformatted the text for relay K103 to remove any confusion. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.5 SUMMARY OF WALKDOWN FOR H-6-14102 SHEET 1: ELECTRICAL LAYOUT, SERVICE EQUIPMENT & GROUNDING SCHEME, HANFORD

AS FOUND:

The power layout diagram did not reflect the correct fuse size for CB1 or correctly show how the contactor K103 was connected in the system. The actual fuse for CB1 is 100 Amp not 90 Amp as depicted on the drawing. The contactor K103 is wired in series with the 60 Amp disconnect and the 75 KVA transformer not in parallel with the 75 KVA transformer. The service equipment layout showed two fuses incorrectly. The 90 Amp main circuit breaker is really 100 Amps and the 50 Amp disconnect is really a 60 Amp disconnect. The grounding electrode conductor, primary equipment ground, and secondary equipment ground wiring schematic was incorrect. The schematic does not reflect a the use of a ground bus in the auxiliary gutter or show the correct wiring configuration.

RESOLUTION:

The drawing was revised to show the correct fuse sizes for the main circuit breaker, the 50 Amp disconnect, and CB1. The power layout diagram was changed to show the contactor K103 in series with the 60 Amp disconnect and the 75 KVA transformer. The service equipment layout was modified to show use of a ground bus in the auxillary gutter and rerouting of the wiring to reflect field conditions. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The review team was unable to verify the transformer and power panel's internal wire connections.

6.6 SUMMARY OF WALKDOWN FOR H-6-14103 SHEET 1: DIAGRAM, HVAC PIPING HANFORD

AS FOUND:

There is a 1/4 inch drain line, exiting to the exterior of the enclosure, from the relief valve (item 23) which was not shown. The piping between the oil separator (item 7) and the gauge tap (item 26) is not shown correctly. The drawing shows the gauge tap as measuring the line pressure

downstream of the compressor but upstream oil separator. The actual location of the gauge tap is downstream of the oil separator.

RESOLUTION:

Added 1/4 inch line from relief valve, Item 23, to exterior and rerouted the line for Item 26 to show correct location downstream of the oil separator. Also, added general note 1 "Some of the information on this drawing has been field verified. For detailed information of items verified see LDU A walkdown report HNF-2964".

ADDITIONAL COMMENTS.

There are no additional comments associated with this drawing sheet.

6.7 SUMMARY OF WALKDOWN FOR H-6-14104 SHEET 1: LDU A OCT VENTILATION CONTROL PANEL

AS FOUND:

The drawing did not reflect relays K100 and K101 or contactors K102 and K103. In addition the drawing did not reflect the keylock switch used to activate the system or indicate the material for the angle brackets used to secure the electrical panel to the enclosure.

RESOLUTION:

Added Items 38 through 46 to the drawing. These items are a Potter Brumfield relay and base for K101, a Dayton relay and base for K100, a Breter two position keylock switch and Unistrut angle bracket, a Square D contactor for K103, a Westinghouse contactor for K102 and a Breter contactor base. In addition the angle brackets were identified as item 2, Aluminum sheet. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDU A walkdown report HNF-2964".

ADDITIONAL COMMENTS.

There are no additional comments associated with this drawing sheet.

6.8 SUMMARY OF WALKDOWN FOR H-6-14105 SHEET 1: CABLE, TRAILER POWER SUPPLY, 480V/3PHASE

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.9 SUMMARY OF WALKDOWN FOR H-6-14107 SHEET 1: L.D.U.A. OPERATIONS CONTROL TRAILER LAN & VIDEO CABLE LAYOUT

AS FOUND:

The three spare ethernet cables going to device 4100A19 and ethernet cable 4400W32 going to device 4100A30A3 were not depicted on ethernet cables in use and spare diagram. Coaxial cable 4230W72 was labeled as a spare in the field. The termination panel 4100A16 in the operations control trailer is labeled as panel 4100A19 in the field.

RESOLUTION:

Added the four ethernet cables and labeled the spare coaxial cable as a spare with 4230W72 as a reference. Also, changed the label on the termination panel in the operations control trailer. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The review team was not able to verify the cable numbers and routing.

6.10 SUMMARY OF WALKDOWN FOR H-6-14109 SHEET 1: LDUA SYSTEM POWER DISTRIBUTION ONE-LINE DIAGRAM

AS FOUND:

The rating for the supply generator was incorrectly identified as 15KW instead of 150KW. The connectors on the power interface module were not identified as J1-J5. There was a cable (5140W2) attached to J1 of the power interface module. The drawing label for J1 is "portable exhaustor (future)". The at-tank instrument enclosure diagram did not reflect the GFCI circuit and none of the labels were correct.

RESOLUTION:

Corrected the generator callout, added the power interface module connector numbers, and added the cable number to the portable exhaustor (future) cable. Corrected the labeling on the at-tank instrument enclosure as follows: changed 208/120VAC INSTR POWER to 4300A3W1J1 ATIE INSTRUMENTATION, changed A/C to 4300A4W1J1 ATIE AIR CONDITIONING, changed W11J1 to 4300A3W11J1, changed W10J1 to 4300A3W10J1, and changed W12J1 to 4300A3W12J1. Added the GFCI with wire number 4300A3W9J1. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.11 SUMMARY OF WALKDOWN FOR H-6-14110: LDUA POWER DISTRIBUTION RACK

6.11.1 H-6-14110 SHEET 1

AS FOUND:

The manufacturers part number for items Item 4 (circuit breaker), item 9 (circuit breaker), item 10 (circuit breaker), item 12 (circuit breaker), and item 16 (female connector) were incorrect. The material description for item 26 (Unistrut bolt), item, 38 (Unistrut bolt), and item 52 (flat bar) were incorrect. The quantity used of item 39 (Unistrut nut), item 40 (lock washer), item 51 (Unistrut bracket), item 52 (Unistrut), and item 53 (bolt) were incorrect. Items 41 and 45 were not used to fabricate this assembly.

RESOLUTION:

Revised part list item numbers 4, 8, 9, 10, 12, 13, 16, 38, 39, 40, 51, 52, and 53. Deleted items 41 and 45 from the parts list. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The review team was not able to verify all of the manufacturers part numbers.

6.11.2 H-6-14110 Sheet 2

AS FOUND:

Part numbers and quantities required were not consistent with the parts/material list on sheet 1 of this drawing. Item 53 was not shown correctly on the drawing. It as shown as flat bar and should have been Unistrut.

RESOLUTION:

Changed part numbers and quantity required to be consistent with PARTS/MATERIAL LIST on H-6-14110 Sheet 1, deleted part 41, and redrew part 52 to match the field configuration.

ADDITIONAL COMMENTS:

The review team was not able to verify all of the part numbers on the drawing.

6.11.3 H-6-14110 Sheet 3

AS FOUND:

The part bubble for item 30 is not pointing to the correct location.

RESOLUTION:

Redraw the part bubble leader line to point to the bolt instead of item 36 (angle iron).

ADDITIONAL COMMENTS:

The review team was not able to verify all of the part numbers on the drawing.

**6.12 SUMMARY OF WALKDOWN FOR H-6-14111: LDUA POWER DISTRIBUTION
RACK ONE LINE DIAGRAM & DETAILS**

6.12.1 H-6-14111 Sheet 1

AS FOUND:

The labels on Panel A circuit breaker are not in agreement with the actual hardware.

RESOLUTION:

Corrected the labels for circuit breakers 1, 2, 7, 8, should have been labeled 12, 11, 16, and 17. Also added label "MAIN" to the 125 Amp circuit breaker, the words PURGE to the air compressor label, and LDUA to the deployment label. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

4.12.2 H-6-14111 Sheet 2

AS FOUND:

The drawing does not show the GEC connection or the frame ground wire.

RESOLUTION:

Added GEC wire to earth ground and frame ground wires.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.13 SUMMARY OF WALKDOWN FOR H-6-14112 SHEET 1: L.D.U.A. SYSTEM POWER DISTRIBUTION CABLE ASSY'S

AS FOUND:

The manufacturers part numbers were incorrect for items 21(male connector), item 23 (male connector), item 25 (female connector), item 28 (female connector), item 29 (female connector), and item 30 (female connector). The wire type description was incorrect for item 13 and item 16. The cable lengths are not all exactly 50 feet long. Cable assembly (Item 3) did not have an item 26 (female connector) attached to one end as shown on the drawing.

RESOLUTION:

Corrected the drawing parts list for the part numbers that were incorrect and the wire type description. The cable lengths were made reference dimensions and general note 8 was added "Cable lengths shown are approximate. Length determined by fabricator". Added item 31 (connector female) part number DF1404FP000 by RUSSELLSTOLL to P2 side of cable assembly item 3. Added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.14 SUMMARY OF WALKDOWN FOR H-6-14113 SHEET 1: LDUA FIBER-OPTIC UMBILICAL INTERCONNECTION DIAG

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.15 SUMMARY OF WALKDOWN FOR H-6-14114 SHEET 1: CONTROL NETWORK INTERCONNECTION DIAGRAM

AS FOUND:

The drawing did not show all of the wire connections between the patch panel and component 4100A19. In addition, the drawing did not show wire labels on the drawing for the patch panel and some of the hardware (components/wires) did not have any labels but the drawing did.

RESOLUTION:

Added parenthesis around the labels that did not exist on the hardware and added general note four which states "Labels shown in parenthesis are not physically on the equipment or item". Showed wires, labeled as "spare", from patch panel connectors 11, 12, and 13 to item 4100A19 terminals 2, 3, and 4. Also labeled patch panel wires with receptacle labels and added flag note six which states "Labels are located on patch panel receptacle". General note five was added which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The drawing team was able to verify all connection points, however, there is a note on the drawing which states that the item of interest is shown as installed in cold test facility. Field connection requirements are to be determined.

6.16 SUMMARY OF WALKDOWN FOR H-6-14115 SHEET 1: I/O SUBSYSTEM INTERCONNECTION DIAG

AS FOUND:

Two wires on connector adapter module missing wire labels. Wire labels not consistent with hardware of the wires from the serial ports to the video display and recording system.

RESOLUTION:

Added missing wire numbers for wires from CONNECTOR ADAPTER MODULE. In addition, revised the wire numbers for the wires from SERIAL PORTS to VIDEO DISPLAY AND RECORDING SYSTEM and also added part number 4400A6 to reference diagram CONTROL NETWORK INTERCONNECTION DIAG. General note five was added which states "Some of

the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.17 SUMMARY OF WALKDOWN FOR H-6-14116 SHEET 1: I/O SUBSYSTEM CONVERTER & TERMINAL BLOCK ASSEMBLY

AS FOUND:

The 4 x 4 adhesive backed cable tie mounts did not exist on the hardware.

RESOLUTION:

Deleted wording and picture for 4 x 4 adhesive backed cable tie mounts. Also, added general note which says "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify internal connections of detail A.

6.18 SUMMARY OF WALKDOWN FOR H-6-14117: I/O SUBSYSTEM CONNECTOR ADAPTER MODULE ASSEMBLY

6.18.1 H-6-14117 Sheet 1

AS FOUND:

Components are dimensioned but there is no tolerance associated with the dimensions. Some of the dimensions are in error. The 2.5x.12 slot for the ribbon cables is 2.75 x.12, the 1.187 edge distance to the pc board connectors is 1.375, the overall length of 5.937 is 5.875, and the .187 cutouts are .25.

RESOLUTION:

Added a tolerancing note which allowed 1/16 inch tolerance on all dimensions. Corrected the dimensions which were in error and added a general note which stated "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.18.2 H-6-14117 Sheet 2

AS FOUND:

The connector adapter module connection diagram is used to specify connections for 4 connections 4220A7, 4220A8, 4220A9, and 4220A10 but the labeling scheme did not reflect this.

RESOLUTION:

Added note to cable labels "Wire labels A9 and A10 for equipment 4220A6A5. Wire labels A7 and A8 for equipment 4220A6A3."

ADDITIONAL COMMENTS:

The walkdown team was not able to verify internal connections nor pin numbers

6.19 SUMMARY OF WALKDOWN FOR H-6-14118 SHEET 1: VIDEO DISPLAY AND RECORDING SYSTEM INTERCONNECTION DIAG

AS FOUND:

The tank overview video y and tank overview video C were connected to one of the video converters and not the video switcher A1J2 and A3J2. The video OCT fiber-optic interface output was split between the video converter and VCRs, this split was not depicted. The operation overview video system patch panel was connected to A2J10 and A4J10 in the video switcher. There was no connection between the 2-way video distribution amplifier J7 and the XYBION. The video converter NOVA Y/C2 was connected to A1J2 and A3 J2 in the video

switcher not to A2J10 and A4J10. The video switcher outputs were all mislabeled. The connections at A6J17 on the video switcher output was mislabeled. The quad video splitter input labels were all incorrect. The following equipment was not connected: the S-VHS 4230A19 and playback unit, video monitor 4230A2, video monitor 4230A11, and Stereo Emitter 4230A17.

RESOLUTION:

The drawing was modified to show the correct configuration and labeling of the cables and equipment. All of the equipment that was not installed was installed so that the connections could be verified. Added a general note which stated "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify all cable numbers, component numbers and connection points.

**6.20 SUMMARY OF WALKDOWN FOR H-6-14119: VIDEO SYSTEM PANELS
GENERAL ARRANGEMENT**

6.20.1 H-6-14119 Sheet 1

AS FOUND:

There are two com ports which were not shown on A9 labeled REF and IN. There is a ground bus, auto reset switch, alarm switch, and two time adjustment pots on the quad video splitter that were not shown on the drawing.

RESOLUTION:

The com ports were added to the video switcher back panel A9 and the ground bus (labeled) with the two switches and time adjustment pots were detailed on the quad video splitter. Also added a general note which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.20.2 H-6-14119 Sheet 2

AS FOUND:

All of the labels on this drawing are incorrect. The general note which specifies the cable type is not complete.

RESOLUTION:

Corrected all of the wire labels and completed the note for the cable type by adding LV-616 to the end of the general note.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.21 SUMMARY OF WALKDOWN FOR H-6-14120 SHEET 1: VIDEO DISPLAY AND RECORDING SYSTEM CABLE ASSEMBLY

AS FOUND:

The part call out and manufacturer for item 16 labels was incorrect. In addition, flag note 1 specified the wrong color of background for the cable labels.

RESOLUTION:

The manufacturer and part number were deleted from item 16 and the color of the background in flag note 1 was changed from yellow to white. Also added a general note which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.22 SUMMARY OF WALKDOWN FOR H-6-14121 SHEET 1: I/O SUBSYSTEM CABLE ASSEMBLY

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

There is no indication of what these cables are used for.

6.23 SUMMARY OF WALKDOWN FOR H-6-14125: ATIE ASSEMBLY DRAWING

6.23.1 H-6-14125 Sheet 1

AS FOUND:

The manufacturers part number for item 5 (120 V heater) was incorrect. The description and manufacturers part number were incorrect for item 21 (female receptacle), the receptacle is rated for 60 Amps not 30 Amps. Items 61 and 62 should not be called out in the parts list. There are no tolerances associated with the overall dimensions and the many of the dimensions are incorrect.

RESOLUTION:

Revised the drawing to include the correct manufacturers part numbers and descriptions. Deleted items 61 and 62 from the parts list and corrected the dimensions that were incorrect. Also, added a tolerance of $\pm 1/8$ inch and a general note which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The drawing team was not able to verify all of the part numbers associated with this drawing sheet.

6.23.2 H-6-14125 Sheet 2

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.23.3 H-6-14125 Sheet 3

AS FOUND:

Some of the dimensions were incorrect and there was no tolerances associated with the dimensions. Item 9 (thermostat) is not shown in the correct location.

RESOLUTION:

The drawing was modified to show the correct dimensions and a tolerancing note was added to the assembly of $\pm 1/8$ inch. Item 9 was shown in the correct location.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.23.4 H-6-14125 Sheet 4

AS FOUND:

The overall dimensions for the sun shield were incorrect and no tolerances were given.

RESOLUTION:

The drawing was revised to correct the overall dimensions and a tolerancing note of $\pm 1/8$ inch was added to the drawing.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

**6.24 SUMMARY OF WALKDOWN FOR H-6-14126: ATIE ELEMENTARY
DIAGRAM AND PANELBOARD SCHEDULE**

6.24.1 H-6-14126 Sheet 1

AS FOUND:

The panelboard circuit breaker service label was not labeled like the hardware. The overall nameplate schedules were incorrect. The wire designations for the air compressor was incorrectly specified. The panelboard designation on the ATIE elementary diagram was not identified correctly.

RESOLUTION:

The drawing was revised to reflect the correct labels on the circuit breaker panelboard label schedule. The nameplate schedules were removed from this drawing and the information was placed on H-6-14174 which is the LDUA label drawing. The wire and panelboard designations were corrected and a general note was added which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.24.2 H-6-14126 Sheet 2**AS FOUND:**

Wires DS6516MP-4 and -5 connect to CB7 not the neutral and ground on the PDP. The wire labels for wires from CB10, CB12, CB8, CB11, CB22, CB24, CB14, and CB15, on the PDP are incorrect. The hot wire to PS4 is from CB12 not CB7. The wire connected to the fuse F1 is labeled on the hardware as CB13 but comes from CB15. The hot wire to LT1 comes from CB9 but is labeled CB2 on the hardware. The labels on TD1 connections 2 and 7 are mislabeled. The labels on CR1 connections 4, 5, and 8 are mislabeled. The spare receptacle fed by CB11 is a utility outlet.

RESOLUTION:

The drawing was modified to reflect the correct wire designations including the circuit breaker designation for the PDP. The drawing was also modified to reflect the correct wire designations for PS4, TD1, CR1, F1, and LT1. Added flag note 1 for F1 which states "Wire CB13 connects to breaker CB15". Added flag note 2 for LT1 which states "Wire CB2 connects to breaker CB9".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.25 SUMMARY OF WALKDOWN FOR H-6-14131: AT-TANK INSTRUMENT ENCLOSURE (ATIE) INTERCONNECTION DIAGRAM**6.25.1 H-6-14131 Sheet 1****AS FOUND:**

The Extended Reach End Effector controller and Gripper End Effector Vision chassis were not depicted on this drawing. The Extended Reach End Effector has two outputs from the At-Tank Instrument Enclosure and is attached to the GENI/O #2 device. In support of the Extended Reach End Effector controller is device 4300PCV2 which was not depicted on the drawing and a connection to the ATIE Kit (TB4). The CVEE Electronics chassis and CVEE power supply have terminal strip connections that were not reflected on this drawing. There is a single (J1) output from the At-Tank Instrument Enclosure from the CVEE not three outputs which were reflected on the drawing. There was not a direct connection between the CVEE power supply and the ATIE Kit as depicted on the drawing or a connection between the Video CU/Fiber converters (P2) and the ATIE Kit (A3TB1). There is a connection from the Fiber Optic Interface Panel to

(P2) and the ATIE Kit (A3TB1). There is a connection from the Fiber Optic Interface Panel to the Video CU/Fiber converter (P2) that was not reflected on the drawing and the labels for the equipment cable ports do not match the hardware. The power supply for the Video CU/Fiber converter is not shown on the drawing and the two blank ports have cables attached to them labeled OVS Cam and Shoulder Cam. There are only two fiber optic cables from the control trailer instead of the four that were depicted on the drawing and the remaining fiber optic cables labeled "future" did not exist. There are not any "future" electronics panels attached to the Fiber Optic Interface Panel via fiber optic cables 4300A1W3 and 4300A1W4 as depicted on the drawing. There are four rad detector inputs and outputs attached to the Rad Monitor not one as depicted on the drawing. The power supply for the Rad Monitor electronics is not shown on the drawing. The cable labels for the ATIE Instrument power and A/C power were different than depicted on the drawing.

RESOLUTION:

Revised the drawing to add 6510A2 (GRIPPER END EFFECTOR VISION SYSTEM), 6510A1 (GEE PNEUMATIC CONTROL PANEL), 6530A1 (EREE CONTROL), and 4300PCV2 in detail. Provided a more detailed diagram of the Rad Monitor Electronics. Remove the extra fiber optic cables, future electronic chassis, and extra J connections. Provided a detail of the connections between the CVEE Electronics chassis and the CVEE power chassis. Corrected the drawing to reflect the actual in field labels for cables and connectors. Added general note 8 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.25.2 H-6-14131 Sheet 2

AS FOUND:

The terminal board label (TB1) was not called out on the drawing for the CVEE input terminal board and there are multiple terminal boards in the CVEE. The connections to the CVEE input terminal board are through shielded wires which are tied to a common point which was not shown on the drawing.

RESOLUTION:

Modified the drawing to reflect the shielded wires and the terminal board label.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

**6.26 SUMMARY OF WALKDOWN FOR H-6-14132 SHEET 1: ATIE OPTO-22
DRAWER NO. 1 WIRING DIAGRAM**

AS FOUND:

The ground wire is not shown from the Fiber-Optic Data Link Adapter or the 8-Channel Analog I/O Rack to the receptacle. The termination point labels were different than the actual hardware for the 8-Channel Analog I/O Rack and the 16 Channel Digital I/O Rack. The wires for the Decon Control terminals BB, AA, and P/ were from TB2 not TB3 as reflected on the drawing.

RESOLUTION:

Modified the drawing by showing the ground wire from the Fiber-Optic Data Link Adapter Model AC40 to the receptacle and from the 8 Channel Analog IO Rack to the receptacle. Also corrected the labels so that they matched the hardware. Added general note 7 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

**6.27 SUMMARY OF WALKDOWN FOR H-6-14133 SHEET 1: ATIE OPTO-22
DRAWER NO. 2 WIRING DIAGRAM**

AS FOUND:

There are two terminal boards labeled TB3 on the drawing and the terminal boards were not labeled on the hardware. The terminal board which supplies AC power to the system was wired differently than depicted on the drawing. The power for the 24 VDC power supply comes from AC power terminal board slot 4 not 8. Slot 8 feeds the tripple output power supply not slot 4. Channels 5, 6, and 7 of the 8 Channel Analog I/O Rack were not spares as depicted on the drawing, they have AD7, AD7, and DA5 respectively. The cable label call outs for the TIP utilities, Video Electronics, and Gripper Electronics was different on the actual hardware.

RESOLUTION:

Revised the drawing to reflect the correct wiring configuration for the AC power terminal strip. Removed the terminal strip labels from the drawing, corrected the label call outs for the attaching cables, and added AD7, AD7, and DA5 to channels 5, 6, and 7 of the 8 Channel Analog I/O Rack. Added general note 6 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.28 SUMMARY OF WALKDOWN FOR H-6-14134 SHEET 1: ATIE INTERLOCK JUNCTION DRAWER WIRING DIAGRAM

AS FOUND:

The power plug and power switch (PS) which supply power to TB1(4) and TB1(5), and the respective power indicator light, was not shown on the drawing..

RESOLUTION:

Add the power plug, power switch, power indicator light, and associated wiring to the drawing. Also, added general note 2 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.29 SUMMARY OF WALKDOWN FOR H-6-14135: AT-TANK INSTRUMENT ENCLOSURE (ATIE) INTERNAL CABLE ASSY'S

6.29.1 H-6-14135 Sheet 1

AS FOUND:

The cable assembly labeled "D" does not exist on the hardware, it was replaced by an air hose. The manufacturers part number for item 39 (straight connector) is incorrect.

RESOLUTION:

Deleted cable assembly "D" from the drawing, this included deleting items 4, 21, 22, 32, 34, 35, and 36 from the parts list. Corrected the part number of the straight pin connector (item 39) and added general note 6 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The drawing walkdown team was not able to verify the shields for the cable assemblies.

6.29.2 H-6-14135 Sheet 2

AS FOUND:

Item 44 did not have any information in the parts list yet this item was used to fabricate assembly A. The manufacturers part number was incorrect for items 41 (pin connector) and item 60 (pin connector). Items 54 (connector jam nut) and 55 (connector jam nut) were not used on this drawing and do not exist on the hardware.

RESOLUTION:

Revised the drawing to add the information about item 44 (straight pin connector), correct the information for items 41 and 60, and delete items 54 and 55.

ADDITIONAL COMMENTS:

The drawing walkdown team was not able to verify the shields for the cable assemblies.

6.29.3 H-6-14135 Sheet 3

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The drawing walkdown team was not able to verify the shields for the cable assemblies.

6.30 SUMMARY OF WALKDOWN FOR H-6-14140 SHEET 1: LDUA LASER ALIGNMENT FIXTURE

AS FOUND:

There was no correlation between the drawing and the field hardware. The only correct information on this drawing is item 11 (laser pen) of which there are 4.

RESOLUTION:

This drawing was as-built from scratch using the existing component as a template to form the drawing. The only item used from the old drawing was item 11 (laser pen). Added general note which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the materials of construction.

6.31 SUMMARY OF WALKDOWN FOR H-6-14142: OPERATIONS OVERVIEW VIDEO CAMERA SYSTEM CABLE SCHEMATIC

6.31.1 H-6-14142 Sheet 1

AS FOUND:

The manufacturers part numbers for items 20 (connector), item 28 (pan & tilt), and item 34 (video switcher) were incorrect as shown on the drawing. Item 15 (7 conductor shielded cable) is used to create item 5 (cable assembly) but is not reflected as such on the drawing. Items 12 and 13 (dual shielded cable) is not used to fabricate any of the hardware depicted by this drawing.

RESOLUTION:

The drawing was revised to add item 15 to assembly 5, delete items 12 and 13 from the parts list, and correct the manufacturers part numbers for items 20, 28, and 34. Added general note 4 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The drawing walkdown team was not able to verify the shields for the cable assemblies.

6.31.2 H-6-14142 Sheet 2

AS FOUND:

Some of the reference numbers on the face of the drawing do not exist on the hardware. Item 9 (coax) and Item 10 (coax) are not identified on the face of the drawing.

RESOLUTION:

A note was added to the drawing which states " labels in parentheses () are not physically found in the field. In addition, all labels not found in the field were placed in parentheses on the face of the drawing. Part bubbles 9 and 10 were added to the face of the drawing wherever item 6 and 7 were identified respectively.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.32 SUMMARY OF WALKDOWN FOR H-6-14145: L.D.U.A. SYSTEM MISC CABLE ASSEMBLIES

6.32.1 H-6-14145 Sheet 1

AS FOUND:

The manufacturers part number for item 14 (cable), item 29 (pin connector), and item 30 (pin connector) were incorrect. Item 8 (cable 2000A6W4), item 11 (coax cable), Item 12 (coax cable), item 23 (straight pin connector), item 31 (BNC plug), and item 34 (flexible conduit) do not exist but were reflected on the drawing. Cable 2000A6W4 was replaced by an air line. General note 5 which required any coax cables to be put in flexible conduit with heat shrink over the ends was not implemented on the hardware.

RESOLUTION:

The drawing was revised to correct the manufacturers part number for items 14, 29, and 30. In addition items 8, 11, 12, 23, 31, 34, and general note 5 were deleted from the drawing. Added general note 6 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The drawing walkdown team was not able to verify the shields for the cable assemblies.

6.32.2 H-6-14145 Sheet 2

AS FOUND:

Item 8 (cable assembly 2000A6W4) was replaced by an air line and was not used on LDUA.

RESOLUTION:

The drawing was revised to remove Cable 2000A6W4, Item 8

ADDITIONAL COMMENTS:

The drawing walkdown team was not able to verify the shields for the cable assemblies.

6.33 SUMMARY OF WALKDOWN FOR H-6-14242: HIGH RESOLUTION STEREOSCOPIC VIDEO CAMERA SYSTEM (HRSVS)

6.33.1 H-6-14242 Sheet 1

AS FOUND:

Item 25 (3/8 rod) was not a reference for the assembly as depicted on the drawing. Item 31 was called out on the face of the drawing but it does not exist. Part bubble for Item 39 (screw) was not indicating the correct location. Item 32 (Halogen lamp) does not exist on the hardware in every location specified by the drawing. A 1/4 inch slotted round head screw was where item 34 (handle) should have been. If multiple components were needed for the assembly, they were not all called out on the face of the drawing. Items 60 (screw), 80 (TV lens), 81 (TV lens), 82 (TV lens), and 83 (TV lens) are not depicted on the face of the drawing.

RESOLUTION:

The drawing was revised as follows: deleted ref above Item 25 and part bubble 31 above top view. Moved part bubble for Item 39 and added 4 PL after the part bubble. Lined up part bubbles 62, 72, 73, & 74 in top view so that they reflected the correct location. Added 2 PL after Item 37 in top view. Added Item 39, 8 PL and Item 82, 2 PL, OPTIONAL to right side view. Added 8 PL after Item 38 and added (OPTIONAL) to Item 34 in right side view. Added general note 2 which states "Item 60, 80, 81, 82, & 83 Are Not Shown On This Drawing". Also added general note 3 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The drawing team was not able to verify items 8-12, or 21-24, or 36-29, or 33-37, or 45-50 of the parts list. In addition the drawing team was not able to verify material references for all parts identified in the parts list.

6.33.2 H-6-14242 Sheet 2

AS FOUND:

Item 84 (HRSVS end bumper) which is detailed on this drawing sheet does not have the 4 through holes identified for item 39 to fit through. Item 21 is mislocated on the drawing. The material for the construction of item 84 is not correct on the drawing, should be stainless steel.

RESOLUTION:

The drawing was revised to add Item 85, 1/4" screws to parts list, add the call out for 4, .145 through holes equally spaced on Item 84, and revise the material call out for item 84 from Delrin to Stainless Steel.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify items 51-83 of the drawing due to inaccessibility of the components. The material for the construction of item 84 could not be verified.

6.34 SUMMARY OF WALKDOWN FOR H-6-14246 SHEET 1: CLOSE-UP STEREO VIDEO SYSTEM CAMERA HOUSING SCHEMATIC

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the wiring schematic due to inaccessibility.

6.35 SUMMARY OF WALKDOWN FOR H-6-14270: COMMON VIDEO END EFFECTOR (CVEE) SUPPORT ELECTRONICS

6.35.1 H-6-14270 Sheet 1

AS FOUND:

The terminal board connector labels for the B2 Brain Board A/0-A/12 were depicted in reverse from the actual hardware.

RESOLUTION:

The drawing was modified to show the correct labeling of the Brain Board. Also added general note 1 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.35.2 H-6-14270 Sheet 2

AS FOUND:

The terminal board connector labels for the B2 Brain Board A/0-A/12 were depicted in reverse from the actual hardware. The Optical Alignment Scope (OAS) was determined not to be a part of the LDUA system.

RESOLUTION:

The drawing was modified to show the correct labeling of the Brain Board. In addition, a general note was added to this sheet which states "OAS concept did not work because of mechanical features of the arm. OAS is not part of LDUA. Rev. 1 deletes this portion of the drawing sheet."

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the wiring configuration for the Optical Alignment Scope.

6.35.3 H-6-14270 Sheet 3

AS FOUND:

The terminal board connector labels for the B2 Brain Board A/0-A/12 were depicted in reverse from the actual hardware.

RESOLUTION:

The drawing was modified to show the correct labeling of the Brain Board.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the wiring configuration for the High Resolution Stereo Video System

6.35.4 H-6-14270 Sheet 4

AS FOUND:

The relay designations on the drawing did not match the field configuration for relays K4-K9. The B2 Brain Board was not shown with all of the required panels. The specified chassis dimensions were different than the actual dimensions, and the Back view of the chassis did not have the equipment labeled as in the field.

RESOLUTION:

The drawing was revised to reflect the correct relay designations, labeling of the equipment on the back of the chassis, chassis dimensions, and correct number of panels for the Brain Board. In addition general note 3 was added which states "Dimensions are reference only".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.35.5 H-6-14270 Sheet 5

AS FOUND:

The location of the side access cutouts, overall chassis height, location of pin connectors, and holes for standoffs were not in agreement with the drawing. Also general note 2 required the chassis to be on pull out rollers for easy access which does not agree with the hardware.

RESOLUTION:

The drawing was revised to reflect the field dimensions of the equipment and general note 2 was deleted. Also added a dimensional tolerancing note of $\pm 1/8$ inch on all dimensions.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.35.6 H-6-14270 Sheet 6

AS FOUND:

The hardware wiring for K6, K7, TB3, TB4, and Digital Rack And B1 Brain Board did not match the drawing.

RESOLUTION:

The drawing was revised to match the actual wiring configuration for K6, K7, TB3, TB4, and Digital Rack And B1 Brain Board.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.35.7 H-6-14270 Sheet 7

AS FOUND:

The wiring diagram for the 15V power supplies did not match the field configuration. The power supplies are wired in series and jumpered to a common ground. The wiring diagram for the analog rack of the B2 Brain Board did not match the field configuration. Signal 1 G feeds 13UA which is jumpered to 12UA which is jumpered to 11UA and TB2-9 is wired to 1UA not 1UL.

RESOLUTION:

The drawing was revised to reflect the correct wiring for the 15 V power supplies and the B2 Brain Board.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.35.8 H-6-14270 Sheet 8

AS FOUND:

The drawing does not show a shield termination point for the First OPTO Rack. The Second OPTO Rack that is depicted on the drawing and is integrally wired to the First OPTO Rack does not exist as part of the LDUA Hardware. The converter is missing the in field equipment labels for the converter assembly and the electrical junction.

RESOLUTION:

The drawing was revised by eliminating the Second OPTO Rack and all related electrical connections. In addition, the shield termination point was shown for the First OPTO Rack and the equipment label (4220A11) and electrical junction (J3) were shown for the converter.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.36 SUMMARY OF WALKDOWN FOR H-6-14271: WHC POWER CHASSIS LAYOUT (CVEE)

6.36.1 H-6-14271 Sheet 1

AS FOUND:

The equipment labels are not correctly depicted on the drawing.

RESOLUTION:

The drawing was revised to show the labels as they exist in the field. Also added general note 1 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.36.2 H-6-14271 Sheet 2

AS FOUND:

The 15V power supply PS4 is wired to TB3-2 which is wired to D3-C and D4-A respectively. The drawing did not show this configuration. The switch SW2-2 is wired to K2-6 and switch SW1-1 is wired to PS1-L (5V power supply) which were not depicted on the drawing, and K1-1 is wired directly to PURGE A not jumpered to P1-L as shown on the drawing.

RESOLUTION:

The drawing was revised to show the correct connections between TB3, SW1, SW2, Indicator D4, 15 VDE Power Supply PS4, K2, K1, and Bendix PT02E-105S.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.36.3 H-6-14271 Sheet 3

AS FOUND:

The grounds from J1 and P1 are jumpered together not separate grounds as depicted on the drawing, and the manufacturers model number for K1 and K2 were incorrect.

RESOLUTION:

The drawing was revised by removing the ground from P1 and jumpering the ground from P1 to J1. Also, the model number was corrected for the K1 and K2 relays.

ADDITIONAL COMMENTS:

There are no additional comments associated with this drawing sheet.

6.37 SUMMARY OF WALKDOWN FOR H-6-14297: LDUA RISER ISOLATION VALVE ADAPTER

6.37.1 H-6-14297 Sheet 1

AS FOUND:

The description for the studs and bolts items 3, 6, 7, 8, and 11 incorrectly identified the threads as 2B instead of 2A. The quantities of items 6, 7, 8, and 10 were incorrectly specified on the drawing. The O.D. for the riser isolation valve adapter was incorrectly identified as 21 inches. View A and section AA did not correctly represent the clearance hole location with respect to the adapter flange and provides no other useful information. The knife valve was only depicted as phantom on this drawing and was not called out in the parts list, however, this valve is integral to fabrication of the assembly depicted by this drawing. A cover plate was added to the knife valve using manufactured brackets neither of which are represented on the drawing. Items 10 (lockwasher) and 11 (nut) are really used at the next assembly where the valve would be attached to the tank riser.

RESOLUTION:

The drawing was revised to reflect the correct thread identification of items 3, 6, 7, 8, and 11. Also, the quantities of the fasteners (items 6, 7, 8, and 10) were corrected on the drawing. The parts list items were re-numbered to meet current drafting standards and added numerous items such as the knife gate valve, deck plate with its mounting brackets and hardware were added. View A and section AA were deleted from the drawing because they provided no useful information. The details of the cover plate (item 22) and attachment brackets (items 21 and 23) were shown and the riser isolation valve adapter O.D. was corrected. A general note was added which stated that items 10 and 11 would be used to connect item 1 to the riser at next assembly. Also added general note 1 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team could not verify the internal dimension of Items 2 (riser isolation valve adapter) and 3 (gasket).

6.37.2 H-6-14297 Sheet 2**AS FOUND:**

The knife valve was shown only in phantom on this assembly and the assembly was not identified as an assembly. The assembly did not reflect the addition of a cover plate over the knife valve. The hole alignment for the valve cover plates were shown incorrectly as each is rotated 15 degrees from the centerline. The bolts were shown as hex head, but are really socket head fasteners. The assembly did not reflect the use of two longer studs in the bottom flange which would be used as alignment fixtures when the assembly is attached to the riser flange.

RESOLUTION:

The drawing was revised to reflect the overall assembly of the riser isolation valve. This included the addition of the valve cover and associated hardware both pictorially and through use of part bubbles. This also included showing the top flange rotated 15 degrees. A general note and flag note were added which state "Alternate using every other hole to connect the upper and lower adapter plates to the valve." and "Locate items 19 and 20 opposite hand on bottom plate". These notes were used to reflect the alignment of the upper and lower plates with respect to the knife valve body. Another flag note was added to the cover plate brackets which directs the brackets installation using hardware from the knife valve.

ADDITIONAL COMMENTS:

The drawing team was not able to verify the internal dimensions of the assembly.

6.38 SUMMARY OF WALKDOWN FOR H-6-14299 SHEET 1: LDUA TRIC RIGGING FIXTURE**AS FOUND:**

The plan view of the assembly was not drawn correctly and did not correspond with the actual hardware or section views of the drawing. The shackles were identified on the face of the drawing as being 3 1/4 ton when they were rated for 4 1/2 ton.

RESOLUTION:

The drawing was reformatted to include a parts list and part bubbles in compliance with current drafting standards. The information for the parts list was taken from the body of the drawing which identified all materials of construction. The shackles were identified in the parts list as rated for 4 ½ tons. Added general note 9 which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENT:

The walkdown team was not able to verify raw material. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.39 SUMMARY OF H-6-14304 WALKDOWN

6.39.1 H-6-14304 Sheet 1

AS FOUND:

Some fasteners, eyelets, pipe fittings, hose, and quick disconnects were missing from the parts list which are required as part of the assembly. The quantities of fasteners identified on the drawing (items 11, 12, 14, 18, 22, 37, and 64) were incorrect.

RESOLUTION:

The drawing was modified by reorganizing the parts list to establish sub-assemblies in order to meet current drafting standards. In addition, the quantities for items 11, 12, 14, 18, 22, 37, and 64 were corrected to reflect actual quantities required for assembly and items 65-74 were added. General note 13 was added which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The drawing walkdown team was not able to verify the raw materials used to fabricate the components or verify that loctite had been used on all fasteners that did not have lockwashers as required by general note 5.

6.39.2 H-6-14304 Sheet 2**AS FOUND:**

Not all of the glove ports on the TRIC assembly have glove assemblies (items 41, 42, 43, and 44) as required by the drawing. The actual hardware utilized two different types of fasteners to attach the bottom plate of the TRIC assembly depending on whether or not they were also used to attach the TRIC lifting plates (item 31). Also, not all of the fasteners used to attach the bottom plate utilized flat washers (item 12). The drawing did not identify all of the materials necessary to add the DE-STA-CO clamps to the front door of the enclosure or the fact that the clamp was modified from its original configuration. In addition, the DE-STA-CO clamps were not located in any particular fashion and the weld symbol for the DE-STA-CO clamp was incorrect. The drawing did not depict the correct quantities of items 11, 12, 14, 16, 18, 22, 23, 24, 26, 27, 35, or 37.

RESOLUTION:

Flag note 7 was added to the drawing which states "Glove port may be configured with different hardware provided proper seal is maintained" which allows for material other than gloves to be placed in the glove ports. Fasteners (item 66) were added to the drawing to reflect the use of different fasteners for attaching the TRIC lifting plates and the use of item 12 was made optional. Items 68 and 69 were added to the drawing to be used to attach the DE-STA-CO clamps to the enclosure door, also, flag notes 8 and 9 were added which state "Modify DE-STA-CO clamp to provide 3 3/4 inch reach. Weld as required." and "Field locate DE-STA-CO clamps to provide additional compression of enclosure door." respectively. The drawing was revised to correctly identify the weld for the DE-STA-CO clamps and to correctly identify the quantities of items 11, 12, 14, 16, 18, 22, 23, 24, 26, 27, 35, and 37.

ADDITIONAL COMMENTS:

The walkdown team could not verify the materials of construction.

6.39.3 H-6-14304 Sheet 3**AS FOUND:**

The drawing did not correctly identify what substitutions could be made to the installation of the HEPA filter assembly. The drawing showed hex nuts attached to the top of the filter assembly which do not exist. The drawing did not show the eyebolts which were internal to the enclosure.

RESOLUTION:

The drawing was modified to show either the HEPA filter assembly or a cover flange for the penetration in the enclosure. Flag note 10 was also added which states "Item 65 may be substituted for item 18 when using item 36." which allows the use of wing nuts to hold the cover flange in place. The hex nuts were eliminated from the filter assembly and the eyebolts were added to the top view along with dimensions to locate them on the top of the enclosure.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types and the HEPA filter (item 2) could not be verified because it was not installed at the time of the drawing walkdown.

6.39.4 H-6-14304 Sheet 4**AS FOUND:**

The eyebolts which are internal to the enclosure are not shown in on the drawing, however, the drawing does depict procured eyebolts which do not exist on the hardware. Not all of the glove ports on the TRIC assembly have glove assemblies (items 41, 42, 43, and 44) as required by the drawing. The actual hardware utilized two different types of fasteners to attach the bottom plate of the TRIC assembly depending on whether or not they were also used to attach the TRIC lifting plates (item 31). Also, not all of the fasteners used to attach the bottom plate utilized flat washers (item 12). The drawing did not identify all of the materials necessary to add the DE-STA-CO clamps to the front door of the enclosure or the fact that the clamp was modified from its original configuration. In addition, the DE-STA-CO clamps were not located in any particular fashion and the weld symbol for the DE-STA-CO clamp was incorrect. The drawing did not show the correct installation of the angle iron used to support the DE-STA-CO clamps. The drawing did not depict the correct quantities of items 14 and 35 or show the correct configuration of the spray wash flange.

RESOLUTION:

The drawing was modified to show the details and installation of the eyebolts (item 67) which were fabricated and the weld used to attach them to the enclosure. Flag note 7 was added to the drawing which states "Glove port may be configured with different hardware provided proper seal is maintained" which allows for material other than gloves to be placed in the glove ports. Fasteners (item 66) were added to the drawing to reflect the use of different fasteners for attaching the TRIC lifting plates and the use of item 12 was made optional. Items 68 and 69 were added to the drawing to be used to attach the DE-STA-CO clamps to the enclosure door, also, flag notes 8 and 9 were added which state "Modify DE-STA-CO clamp to provide 3 3/4 inch reach. Weld as required." and "Field locate DE-STA-CO clamps to provide additional compression of enclosure door." respectively. The drawing was revised to correctly identify the weld for the DE-STA-CO clamps and to correctly identify the screws used to attach the angle iron to the enclosure door. The drawing was also revised to show the correct quantities of items 14 and 35.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the raw material used to fabricate the assemblies.

6.39.5 H-6-14304 Sheet 5**AS FOUND:**

The actual dimensions of the lifting plate (item 31) and gage bracket (item 55) are different than depicted on the drawing. Also, the true dimensioning on the flange (item 20) provides no added value since it does not refer to any datums with which to control the tolerances to.

RESOLUTION:

The drawing was changed to reflect the correct dimensions of the lifting plate and gage bracket. The true dimensioning symbols were removed from the flange.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the raw material used to fabricate the assemblies.

6.39.6 H-6-14304 Sheet 6

AS FOUND:

The true dimensioning tolerances for items 30 and 36 add no value to the components since there are no datums specified.

RESOLUTION:

Removed true dimensioning tolerances as no datum is specified. Also made flag note * associated with item 29 flag note 12.

ADDITIONAL COMMENTS:

The walkdown team could not verify Item 46 or size of hole for Item 46 (installed on Item 29) or the weld size used to install item 46.

6.39.7 H-6-14304 Sheet 7

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the raw material used to fabricate the assemblies.

6.39.8 H-6-14304 Sheet 8

AS FOUND:

The drawing did not show the correct configuration for the plain flange. It did not show the additional hose or fittings necessary to supply water to the sprayer (item 51). It also did not provide for addition of a cap in place of the open hose barb fitting (item 53).

RESOLUTION:

The drawing was revised to show items 70, 71, 72, and 74 and flag note 11 was added which states "Item 53 may be replace by item 73." where item 73 is the cap that mates to item 54.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the raw material used to fabricate the assemblies.

6.40 SUMMARY OF WALKDOWN FOR H-6-14305: END EFFECTOR HANDLING SYSTEM RAILS

6.40.1 H-6-14305 Sheet 1

AS FOUND:

The tolerancing as specified on the drawing allows ± 1 on single decimal place dimensions would not allow the assembly to be fabricated. The drawing did not depict the correct quantities of hardware (items 31, 37, 38, 46, and 56) used to fabricate the assembly. In addition the drawing did not identify the C-channel to be used to fabricate the rails (items 11 and 21) or the raw stock material used to construct the 4 weldments which utilized several different raw materials. The sheet number as specified on the parts list was in error for most of the components, the description for item 56 (push button pin) was incorrect for the length of the pin used, and item 19 ($\frac{1}{2}$ hex screws) do not exist for this assembly.

RESOLUTION:

The drawing was modified by reorganizing the parts list to establish sub-assemblies in order to meet current drafting standards. In addition, the C-channel used to fabricate the rails was identified along with the raw material used to fabricate the 4 weldments. Item 19 was deleted and the correct quantities of items 31, 37, 38, 46, and 56 were identified. The drawing sheet number was updated for all components, the tolerancing note was modified to read " $.x \pm .1$ ", and the length of item 56 was corrected. General note 8 was added which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The drawing walkdown team was not able to verify the raw materials used to fabricate the components.

6.40.2 H-6-14305 Sheet 2**AS FOUND:**

The drawing reflected the use of item 19 (½ hex bolt) to attach the end effector handling system rails to the TRIC when items 56 (push button pins) were utilized in the field. In addition, the drawing did not reflect the use of item 56 for the hoist stop at the end of the rails or the use of a retaining strap for items 39 (single acting ball lock pins). The drawing did not depict the correct quantity of items 10, 11, 12, 13, 16, 20, 21, 22, 23, 24, 27, 29, 30, 32, 33, 34, 35, 36, 37, 39, 40, 41, 43, 45, 52, or 53. Also, the drawing did not reflect the fact that item 54 (locating pin) was optional.

RESOLUTION:

The drawing was revised to show the use of the push button pins to attach the end effector handling system and as the hoist stop. Flag note 7 was added to address the use of a tether for item 39, it states "Use plastic coated cable to secure item 39 using appropriate hardware". The quantities were corrected for items 10, 11, 12, 13, 16, 20, 21, 22, 23, 24, 27, 29, 30, 32, 33, 34, 35, 36, 37, 39, 40, 41, 43, 45, 52, or 53 and item 54 was made optional.

ADDITIONAL COMMENT:

The walkdown team was not able to verify the raw stock material used in the assembly.

6.40.3 H-6-14305 Sheet 3**AS FOUND:**

The two legs of the end effector handling system are represented by item 12 (tubing modification). The drawing does not reflect the configuration of either leg and the two legs do not match each other. The brace swivel is an assembly made up of 3/8 and 1/2 stock material and threaded inserts (item 25). The drawing does not reflect installation of any of the threaded inserts and some of the stock material sizes. The drawing does not correctly locate the 1.375 hole in the base of the swivel and the end view shows a hidden line as not being hidden.

RESOLUTION:

The drawing was modified to correct for the discrepancies in the end effector handling system legs. The dimensions on the drawing were changed to reflect the dimensions of one of the legs and then all of the dimensions were made reference and flag note 6 was added which states "Field locate holes approximately as shown." which allows for the variations in the legs. The brace swivel was made into an assembly on the drawing (item 4) and the material thickness dimensions were removed and items 11 (3/8 bar stock), 25 (inserts), and 43 (1/2 bar stock) were added as part bubbles where appropriate. The hole was located by stating "both surfaces in line" next to the hole call out and the end view was corrected.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types. The drawing team was also unable to verify the dimensions of the holes and counter bores, however, they did verify that the specified dimensions would work.

6.40.4 H-6-14305 Sheet 4**AS FOUND:**

The weld form between the 3/8 bar and the C-channel was not as specified on the drawing. The C-channel was not identified as such on the drawing and the rails are actually weldments (assemblies) of 3/8 plate and C-channel. The dimensions for the hole pattern through the C-channel were incorrect.

RESOLUTION:

The drawing was modified by making the rails assemblies consisting of item 11 (3/8 bar stock) and item 21 (C3 x 2.58 x 52 L C-channel). These items were added to the parts list and identified on the assembly where appropriate using part bubbles. In addition, the welds between item 11 and item 21 and the hole pattern dimensions were modified to match the actual hardware

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types. The drawing team was also unable to verify the dimensions of the holes, however, they did verify that the specified dimensions would work.

6.40.5 H-6-14305 Sheet 5**AS FOUND:**

The foot is an assembly which consists of welded 3/4 bar stock and two different size threaded inserts which are not identified on the drawing.

RESOLUTION:

The drawing was modified by making the foot an assembly consisting of item 35 (3/4 bar stock), and items 31 and 38 (threaded inserts). These items were identified on the foot assembly where appropriate using part bubbles and item 35 was added to the parts list as 3/4 Aluminum bar stock.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types. The drawing team was also unable to verify the dimensions of items 16, 22, or 27 and of the holes and counter bores for item 35, however, they did verify that the specified dimensions would work.

6.40.6 H-6-14305 Sheet 6**AS FOUND:**

The brace end is an assembly which consists of three different sizes of welded bar stock, two different size threaded inserts and a bushing which are not identified on the drawing. In addition, the side view to the drawing does not correctly represent the through holes, which are drilled at an angle to the view, making the drawing confusing.

RESOLUTION:

The drawing was modified by making the brace end an assembly consisting of items 11, (3/8 bar stock), 35 (3/4 bar stock), 43 (1/2 bar stock), 25 (threaded insert), 31 (threaded insert), and 55 (bushing). These items were identified on the brace end assembly where appropriate using part bubbles. The side view was redrawn to correctly depict the through holes.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the brace end. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types. The drawing team was also unable to verify the dimensions of the holes and counter bores, however, they did verify that the specified dimensions would work.

6.40.7 H-6-14305 Sheet 7**AS FOUND:**

The brace enclosure is an assembly which consists of two different sizes of welded bar stock and one threaded insert which are not identified on the drawing. In addition, the hole pattern on the base of the brace enclosure and gasket are incorrect and reflect additional holes that do not exist. There is true positioning tolerancing of the holes without any reference to any datums.

RESOLUTION:

The drawing was modified by making the brace enclosure an assembly consisting of items 11, (3/8 bar stock), 43 (1/2 bar stock), 18 (threaded insert). These items were identified on the brace enclosure assembly where appropriate using part bubbles. The true positioning tolerances and the extra holes were deleted from the drawing. In addition, the dimensioning of the hole patterns for the base of the brace enclosure and gasket was corrected to reflect the actual hardware.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types. The drawing team was also unable to verify the dimensions of the holes and counter bores, however, they did verify that the specified dimensions would work.

6.40.8 H-6-14305 Sheet 8**AS FOUND:**

The brace intermediate is an assembly which consists of two different sizes of welded bar stock and one threaded insert which are not identified on the drawing. In addition, the hole pattern on the ends of the brace intermediate are not fully specified and the center hub was machined from a single piece instead of being welded from three pieces of $\frac{1}{2}$ bar stock.

RESOLUTION:

The drawing was modified by making the brace intermediate an assembly consisting of items 11, (3/8 bar stock), 43 ($\frac{1}{2}$ bar stock), 18 (threaded insert). These items were identified on the brace enclosure assembly where appropriate using part bubbles. The additional dimensions required to define the hole locations on the end of the brace intermediate were added and an option was added to the center hub which stated "optional, may machine from one piece" while still showing the center hub as being made from three welded pieces of $\frac{1}{2}$ bar stock.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types. The drawing team was also unable to verify the dimensions of the holes and counter bores, however, they did verify that the specified dimensions would work.

6.41 SUMMARY OF WALKDOWN FOR H-6-14306: CART ASSEMBLY**6.41.1 H-6-14306 Sheet 1****AS FOUND:**

There were no discrepancies found on this drawing sheet.

RESOLUTION:

General note 6 was added which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the raw material used to fabricate the assemblies.

6.41.2 H-6-14306 Sheet 2

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types. The drawing team was also unable to verify the dimensions of the holes and counter bores, however, they did verify that the specified dimensions would work.

6.41.3 H-6-14306 Sheet 3

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types. The drawing team was also unable to verify the dimensions of the holes and counter bores, however, they did verify that the specified dimensions would work.

6.41.4 H-6-14306 Sheet 4**AS FOUND:**

Item 33 (cover) Part of the cover was grinded away to allow for clearance, this was not reflected on the drawing.

RESOLUTION:

Added cutout and Note to COPE AS REQUIRED FOR CLEARANCE AT ASSEMBLY.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the drawing team was unable to verify the dimensions of the holes, however, they did verify that the specified dimensions would work.

6.42 SUMMARY OF WALKDOWN FOR H-6-14307: END EFFECTOR TRANSPORT BAR**6.42.1 H-6-14307 Sheet 1****AS FOUND:**

The top assembly was not identified on the drawing. General note 1 incorrectly listed the tolerance for .x as ± 1 inch and also included a statement that "dimensioning and tolerancing in fractions are general dimensions". General note 4 specified all welding shall be performed in accordance to an aluminum welding specification which was in conflict with general note 6 which specified that all welding shall be performed in accordance to a stainless steel specification. The drawing did not specify the correct quantities of item 19 (bearing) and item 33 (washer). Item 40 (socket head cap screw) does not exist on the hardware, and items 65,66, and

67 (hex bolt, nut and washer) were not identified on the parts list. The sheet number designation in the parts list was incorrect for most of the components.

RESOLUTION:

The drawing was revised to add the transport bar as the top assembly, correct the quantity of items 18 and 33, and delete item 40. The general notes on the drawing were also revised so that general note 4 applied to aluminum welding, general note 6 applied to stainless steel welding, the tolerance on .x dimensions was $\pm .1$, and the reference to fractions was deleted. General note 9 was added which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the raw material used to fabricate the assemblies.

6.42.2 H-6-14307 Sheet 2

AS FOUND:

The drawing did not identify the bolt nut and washers needed to attach the cable from drawing H-6-14306 or the tether used to attach the ball lock pins to the assembly. The drawing did not depict the correct quantity of items 15, 17-22, 27, 28, 29, 31-34, 42, 43, 45, 46, 47, 50-53, and 60.

RESOLUTION:

The drawing was modified to add the items 65, 66, 67 (½ bolt, nut, and washer) used to attach the cable from drawing H-6-14306. Flag note 7 was added which states "Use plastic coated cable and crimp connectors as required for retaining wire for ball lock pins". In addition, the drawing was revised to add the correct quantity of items 15, 17-22, 27, 28, 29, 31-34, 42, 43, 45, 46, 47, 50-53, and 60.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the raw material used to fabricate the transport bar. In addition, the walkdown team was unable to verify the internal components of the assembly but verified that they would work as specified on the drawing.

6.42.3 H-6-14307 Sheet 3

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.42.4 H-6-14307 Sheet 4

AS FOUND:

The drawing only reflected two of the three holes in the upper and lower arm clasps (items 12, 13, 14 and 15).

RESOLUTION:

The drawing was revised for items 12, 13, 14, and 15 to correctly show holes/counter bores.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.42.5 H-6-14307 Sheet 5

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

4.42.6 H-6-14307 Sheet 6

AS FOUND:

The drawing did not identify the spring pin used to hold the lead screw nut (item 29) in place.

RESOLUTION:

The drawing was revised to add flag note 8 which states "Install 1/8 diameter spring pin in item 29 during final assy and adjustment".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.42.7 H-6-14307 Sheet 7

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

4.42.8 H-6-14307 Sheet 8

AS FOUND:

The drawing did not specify the use of item 64 (2 inch schedule 40 pipe) was to be used to fabricate item 38 (lifting arm).

RESOLUTION:

The drawing was revised to add the appropriate part bubbles to item 38.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.42.9 H-6-14307 Sheet 9

AS FOUND:

The drawing did not depict the correct configuration of item 39 (handle) which attaches to the transport arm. The drawing reflected a 1 inch radius part, however, the actual part used 7/8 chamfers.

RESOLUTION:

The drawing was revised to show the correct configuration of item 39.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.43 SUMMARY OF WALKDOWN FOR H-6-14308 SHEET 1: VPM ADAPTER**AS FOUND:**

The drawing referred to the two components used to fabricate the assembly as item A and Item B but gave no description as to raw form or material used. General note 1 incorrectly listed the tolerance for .x as ± 1 inch and also included a statement that "dimensioning and tolerancing in fractions are general dimensions" but there are no fractions used on the drawing. The fasteners used to mount the VPM adapter to the VPM isolation valve were not identified on any drawing and this component does not have a next assembly so it was not initially clear to the reviewers what this component was used for.

RESOLUTION:

The drawing was revised to reflect the correct identification of item A ($\frac{1}{2}$ stainless plate) and item B (11 gage stainless sheet). General note 1 was revised so that the tolerance used for .x was $\pm .1$ and the statement about fractions was eliminated. The VPM isolation valve was referenced on this drawing and the hardware used to attach the VPM adapter was added to the parts list. These parts were identified as items 7 (hex bolt, 1 inch dia. 1 3/4 inch long), 8 (hex bolt, 1 inch dia. 1 inch long), 9 (1 inch flat washer), and 10 (eyebolt). Flag note ^ was added which states "Item 10 may be substituted for items 7 and 9 at two locations". General note 7 was added which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.44 SUMMARY OF WALKDOWN FOR H-6-14320: GRIPPER END EFFECTOR ASSEMBLY

6.44.1 H-6-14320 Sheet 1

AS FOUND:

The top assembly was not identified on the parts list of the drawing. General note 1 incorrectly listed the tolerance for .x as ± 1 inch and also included a statement that "dimensioning and tolerancing in fractions are general dimensions" but there are no fractions used on the drawing. Item 28 was identified as a Hex head fastener but is a Socket head fastener. The manufacturer and part number for item 31 (light assembly) was not identified on the drawing and the quantities of item 29 and 30 were specified incorrectly. A metal piece was placed over the circumference of some of the titanium components but was not identified in the parts list.

RESOLUTION:

The drawing was revised to add the top assembly to the parts list. General note 1 was revised so that the tolerance used for .x was $\pm .1$ and the statement about fractions was eliminated. In addition, the description for item 28 was corrected, the manufacturer for item 31 was identified as Visual Inspection Technologies Incorporated, and the quantities of items 29 and 30 were corrected. The metal piece used to cover the titanium was specified as item 41 (20 gage sheet any grade stainless steel). General note 7 was added which states "Some of the information on this drawing has been field verified. For detailed information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material, mounting hardware, or o-rings used to fabricate the components.

6.44.2 H-6-14320 Sheet 2

AS FOUND:

The drawing has a table defining the camera lens type that has not been completed because the range of focus column was not filled out. Items 16, 19, 33, and the stainless sheet were not identified on the drawing. In addition, the drawing did not specify the correct quantities of items 27, 28, and 29. The drawing does not reflect how to attach item 41 to the assembly.

RESOLUTION:

The drawing was revised to reflect the correct quantities of items 27, 28, and 29. In addition, items 16, 19, 33, and 41 (stainless sheet) were identified using part bubbles in the appropriate location and the range of focus column was deleted from the drawing. Also added flag note 6 which states "Shrink fit item 41 around items 11 and 13. Do not cover face of item 11".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the raw material used to fabricate the gripper assembly. In addition, the walkdown team was unable to verify the internal components of the assembly but verified that they would work as specified on the drawing.

6.44.3 H-6-14320 Sheet 3

AS FOUND:

The drawing has a table defining the camera lens type that has not been completed because the range of focus column was not filled out. Also, item 41 (stainless sheet) is not shown in this view of the drawing.

RESOLUTION:

The drawing was revised by deleting the range of focus column from the lens type table and adding the details of item 41 to the appropriate views.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the camera view angles specified on the drawing.

6.44.4 H-6-14320 Sheet 4

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.44.5 H-6-14320 Sheet 5

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

Added the details for the fabrication of item 41 on this sheet.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.44.6 H-6-14320 Sheet 6

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.44.7 H-6-14320 Sheet 7

AS FOUND:

There were no discrepancies found on this drawing sheet.

RESOLUTION:

N/A

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.45 SUMMARY OF WALKDOWN FOR H-6-14321: CAMERA HOUSING ASSEMBLY

6.45.1 H-6-14321 Sheet 1

AS FOUND:

General note 1 incorrectly listed tolerance for .X as plus or minus 1" and also included a statement that "Dimensioning and Tolerancing in Fractions are General Dimensions". Part/Dash Number column incorrectly had x's for items 2 through 47. The quantity for items 11 and 17 was listed incorrectly. Item 16, Gasket, was crossed out. Item 18 did not list thickness of material in description column. Manufacturers part numbers were incorrectly placed in Material/Reference column for items 20, 21, 22, 24, 26, 27, 32, and 34. Thrust washers, items 21 and 29, were incorrectly listed as t-washers. Item 28, Camera, did not list a manufacture or model. Items 45, 46, and 47 did not list sheet number in Sheet column. The spring clip that was installed under some of the cameras mounting brackets was not on the parts list. The internal purging lines also were not shown on the drawing.

RESOLUTION:

General note 1 was revised to by correcting tolerance for 1 place decimals and the part of the note that referred to fractions was deleted. The drawing was revised to remove x's from Parts/Dash Number and moved applicable manufacturers part numbers (items 20, 21, 22, 24, 26, 27, 32, and 34) from Material/Reference. The quantity for item 11 was corrected to AR and the

quantity for item 17 was corrected from 40 to 26. The description for items 16, 21, 28, and 29 was corrected. The sheet number was added for items 45, 46, and 47. Added part number 48, Spring Clip, to parts list and to field of drawing. Added flag note 5 to the left of item 48 in parts list. Added flag note 5 which states "Optional Part May Be Installed Between Item 13 (Camera Clamp), Item 30 (Camera Mounting Plate), and Item 35 (Camera Mounting Plate). Also added general note 6 which states "Some of the Information On This Drawing Has Been Field Verified. For Detailed Information of Items Verified See LDUA Walkdown Report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team could not verify material for metal stock, mounting hardware, and o-rings.

6.45.2 H-6-14321 Sheet 2

AS FOUND:

The part bubbles on assembly 1 plan view, top view, top view projection, and Section A-A did not have quantities listed. The plan view (Zone C-5) incorrectly showed the threaded part of one screw. The top view had extra lines aft of the cameras. The scale for assembly 1 was incorrectly list as 2/1.

RESOLUTION:

The scale call out under assembly 1 was corrected to 1/1. The plan view of assembly 1 was revised by deleting the screw threads and adding AR after item 11. The top view was revised by adding 2 PL (items 26, 27, 28, 29, 34, 37, 38, and 39) and 4 PL (item 32). Also, the top view was revised to add items 23 and 24, 2 PL and to remove extra lines. The top view projection was revised by adding 4 PL to item 13 and 8 PL to item 14. Section A-A was revised by adding 2 PL (items 20, 21, 22, 23, 24, 25, 40, and 41), adding REF (item 2), and adding 4 PL (item 15).

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions or internal components, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.45.3 H-6-14321 Sheet 3

AS FOUND:

Numerous dimensions were shown as true position tolerancing dimensions but no datum was identified.

RESOLUTION:

The drawing was revised by removing all true position tolerancing dimensions.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.45.4 H-6-14321 Sheet 4

AS FOUND:

Numerous dimensions were shown as true position tolerancing dimensions but no datum was identified.

RESOLUTION:

The drawing was revised by removing all true position tolerancing dimensions.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.45.5 H-6-14321 Sheet 5**AS FOUND:**

The details for items 13 and 18 had some dimensions that were shown as true position tolerancing dimensions but no datum was specified. The cover, item 18, did not have angular dimension for numerous angles, did not have a radius call outs for the rounded corners, and the size of the holes was not specified. Numerous dimension for item 18 also had leading zeros which infer a metric dimension. The thickness of the material was incorrectly listed as .060 for 16 gauge material.

RESOLUTION:

The details for items 13 and 18 were revised by removing all true position tolerancing dimensions. Item 18 was revised by removing leading zeros, adding missing angular dimensions, adding 4 X R .25 dimension, and adding call out for 26 X dia.120 Thru holes. The side view of item 18 was revise to show reference dimension "(16 GA, .0595)

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.45.6 H-6-14321 Sheet 6**AS FOUND:**

The detail for item 16, gasket, was incorrectly crossed out and noted as (NOT USED). Numerous dimensions (items 19 and 33) were shown as true position tolerancing dimensions but no datum was identified.

RESOLUTION:

The drawing was revised by reinstating item 16 and correcting all true position tolerancing dimensions.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.45.7 H-6-14321 Sheet 7

AS FOUND:

The detail for item 30 did not show hidden lines for through holes on side view and used true position tolerancing without specifying a datum.

RESOLUTION:

The drawing was revised to remove true position tolerancing and adding hidden lines to side view (item 30)

ADDITION COMMENTS:

Walkdown team could not verify any dimension due to inaccessibility of part.

6.45.8 H-6-14321 Sheet 8

AS FOUND:

The enclosure bottom, item 12, did not have a part bubble, title, or scale listed under the item and many dimensions required to make the part were missing. The plan view of item 12 also had 2 place dimensions which require plus or minus .030 tolerance and were incorrect.. The detail for item 2 did not call out any corner radii. The flat pattern title did not contain any reference to item number.

RESOLUTION:

The enclosure bottom detail (item 12) was revised by adding required dimensions for the "sawtooth" shown on the front view. A part bubble, title, and scale call out was added underneath item 12. The dimension for the overall length and width were corrected in both the front view and the plan view (item 12). Radii call outs were added to both views for item 12.

The camera cover detail (item 2) was revised by adding a note "1/16 min radius after welding". The title for the flat pattern was changed to "item 12 flat pattern".

ADDITION COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.46 SUMMARY OF WALKDOWN FOR H-6-14322: GRIPPER ASSEMBLY

6.46.1 H-6-14322 Sheet 1

AS FOUND:

The Part/Dash Number column incorrectly listed x's for item 10 through 28. The sheet number for item 24 was incorrect. The drawing also did not show that the some parts of the assembly were coated with hastelloy to minimize sparking potential. The drawing also did not reflect that foam pads were installed on end of gripper fingers. General note 1 incorrectly listed tolerance for .X as plus or minus 1" and also included a statement that "Dimensioning and Tolerancing in Fractions are General Dimensions". General note 4 which is a welding note is not used since there is no welding done on this assembly.

RESOLUTION:

The parts list was revised by removing x's from part/dash number column and correcting sheet number for item 24 to sheet 3. Flag note 7 was added to the left of items 21 and 22 in parts list. General note 1 was corrected and general note 4 was deleted. Flag note 7 was added to state "item 22 is coated with a surface finish of hastelloy C-22 applied by electrosparc deposition (ESD) process". Note 8 was added to state "apply self adhesive foam pad to item 22 as required (optional). Also added general note 9 which states "Some of the Information On This Drawing Has Been Field Verified. For Detailed Information of Items Verified See LDUA Walkdown Report HNF-2964".

ADDITIONAL COMMENTS:

Since the gripper was installed on the end plate, the walkdown team could not verify the pneumatic cylinder (item 13), screws (item 28), and o-ring (item 11). Also, the Stock material used to fabricate the assembly could not be verified or that the gripper finger (item 22) had been coated with Hastelloy C-22.

6.46.2 H-6-14322 Sheet 2

AS FOUND:

The part bubbles on assembly 1 did not have quantities listed. Bushings, item 19, was not called out on the assembly.

RESOLUTION:

The drawing was revised by adding 2 PL after items 16, 17, 21, and 22, adding 4 PL after items 15 and 27 and adding 8 PL after item 26. Also added 16 PL after items 24 and 25 and added 24 PL after item 23. Item 19 was added to item 18 and 12 PL was added after item 18/19.

ADDITIONAL COMMENTS:

Since the gripper was installed on the end plate, the walkdown team could not verify the location and installation of item 11, 13, and 28. In addition, the walkdown team was not able to verify raw material used to fabricate the components.

6.46.3 H-6-14322 Sheet 3

AS FOUND:

The detail for item 12 had numerous true position tolerances shown but no datum was identified. The detail for item 23 specified an inside diameter of .502 which, with drawing tolerances, could result in an interference fit.

RESOLUTION:

The detail for item 12 was revised to change true position tolerancing dimensions to three place dimensions. The inside diameter for item 23 was revised by including a tolerance call out of plus .005 and minus .000.

ADDITION COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.46.4 H-6-14322 Sheet 4

AS FOUND:

The details for item 14, 16, 17, and 21 had numerous true position tolerances shown but no datum was identified. The plan view for the left hole in item 15 incorrectly showed the diameter for countersunk hole on the far side of the part as a solid line. The plan view for item 21 incorrectly had two 1.250 dimensions for the center of the holes.

RESOLUTION:

The details for items 14, 16, 17, and 21 were revised to change true position tolerancing dimensions to three place dimensions. The plan view for item 15 was revised to change line type to hidden line for the diameter of the left countersunk hole. The duplicate 1.250 dimension was deleted.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.46.5 H-6-14322 Sheet 5

AS FOUND:

A review of the drawing did not identify any deficiencies.

RESOLUTION:

No drawing changes are required for this sheet

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.47 SUMMARY OF WALKDOWN FOR H-6-14323 SHEET 1: GEE ELECTRICAL SCHEMATIC**AS FOUND:**

The vision system and the OPTO 22 board were not connected. The GEE control panel and the V.I.T. control panel did not have equipment identification number listed. The GEE interconnect cable W4, the OPTO 22 cable, the AC power cable, and the GEE interconnect cable W2 were incorrectly called out.

RESOLUTION:

The drawing was revised to show the vision system and the OPTO 22 board as not connected. Equipment identification number 6510A2 was added above V.I.T. panel call out. Equipment identification number 6510A1 was added above GEE panel call out. The call out for the GEE interconnect cable W4 was changed to "VIT Control Module". The call out for the OPTO 22 cable was corrected by changing cable W3 to cable W2. The AC power cable call out was changed from W1 to PS4. The GEE interconnect cable W2 was changed by deleting the W2 call out. Also added general note 3 which states "Some of the Information On This Drawing Has Been Field Verified. For Detailed Information of Items Verified See LDUA Walkdown Report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team could not verify the vision system diagram and connectors since disassembly of the equipment would have been required.

6.48 SUMMARY OF WALKDOWN FOR H-6-14324 SHEET 1: CABLE ASSEMBLIES**AS FOUND:**

The connector numbers for cables W2, W2, and W4 were incorrect. The OPTO 22 pigtail is terminated at connector which was not called out. The cable type for cables W2 was incorrect.

Cable W3 did not specify equipment number. The length of the cables was not exactly as specified.

RESOLUTION:

The drawing was revised to specify connectors 851-06ED12-3S50 (cable W2), 851-06ED12-3P50 (cable W2), MS312612-10S (cable W3, VIT end), MS3126F16-26X (cable W3, OPTO 22 end), and MS3126F14-18P (cable W4, both ends). An equipment identification number was also added to cable W3. The cable designator table was revised to change the cable for W2 from Beldon #19348 to "type SJT 18 AWG/3C. The length of the cables was revised to show dimensions as reference dimensions. Also added general note 1 which states "Some of the Information On This Drawing Has Been Field Verified. For Detailed Information of Items Verified See LDUA Walkdown Report HNF-2964".

ADDITIONAL COMMENTS:

None

6.49 SUMMARY OF WALKDOWN FOR H-6-14325 SHEET 1: PNEUMATIC BLOCK DIAGRAM

AS FOUND:

Pneumatic block diagram did not show the flow control valves, pressure gauges, and solenoid vent filters. Solenoid valve ports were not numbered. Note 3 incorrectly described electric solenoid valves. Note 4 incorrectly plugged port 3.

RESOLUTION:

The drawing was revised to show pressure gauges on the supply side of solenoid valve 1 and after solenoid valves 1 and 2. Flow control valve symbols, manufacturer and model number of the flow control valves was added after solenoid valves 1 and 2. Filters were added to the vent ports. The ports on both the electric solenoid valves and the manual override valves were numbered. The block for the air compressor was replaced with text that stated "supply air, see H-6-14150 (purge gas P & ID). Note 3 was revised to correctly identify the valve as a 2 position, 5 way valve. Note 4 was revised note that ports 2 and 5 are plugged not 2 and 3. Note 6 was added which states "Some of the information on this drawing has been field verified. For detail information of items verified see LDUA walkdown report HNF-2964".

ADDITIONAL COMMENTS:

Walkdown team could not verify make/maker of the solenoid valves or proportional control valves.

6.50 SUMMARY OF WALKDOWN FOR H-6-14340: DECON MODULE ASSEMBLY**6.50.1 H-6-14340 Sheet 1****AS FOUND:**

The review of the drawing showed that numerous parts such as radiation detectors, radiation detector shielding, electrical connectors, electrical box, NEMA enclosure, intrinsic safety barrier, current rings, pilot lights, valves, quick disconnects, and the miscellaneous nuts, bolts, and mounting hardware was not shown on drawing or in parts list. Item 70 is actually a weldment or subassembly. The quantity was listed incorrectly for items 3, 7, 18, 19, 20, 32, 33, 34, 35, 49, 52, 53, 54, 55, 56, 57, 58, 59, 60, and 81. The quantity for items 71, 73, 74, and 75 were incorrectly listed under the assembly -120 column. The sheet call out for items 52, 53, 54, 55, 56, and 72 was incorrect. The material/ref information for items 43, 69, 72, 73, and 74 was incorrect. The part/dash number for item 72 was incorrect. The part/dash number and the material/ref information for items 73 and 75 was incorrect. The starred note underneath part list should be a general note. The assembly 1 view did not show the installation of the heating element. Assembly 1 incorrectly had part bubbles for items 42 which is installed on subassembly -110 and item 55 which is installed on subassembly -070. Note 2 had a incorrect call out for a surface finish of 125 RHR. The general notes did not address the requirements for intrinsically safe wiring. The general notes also did not address the intrinsic safety barrier switch amplifier settings.

RESOLUTION:

The drawing was revised to include the missing parts by adding items 21, 22, 23, and 82 through 109. The part list was revised to make item 70 a subassembly -120 with items 71, 102, 103, and 104 as used parts. The parts list was also revised to correct the quantities for item 3, 7, 18, 19, 20, 32, 33, 34, 35, 49, 52, 53, 54, 55, 56, 57, 58, 59, 60, and 81. The quantity for items 71, 73, and 74 was moved to the subassy -110 column. The material/ref information for items 43, 69, 72, 73, and 74 was revised. The part/dash number and/or the material/ref information for items 72, 73, and 75 was revised. Note 2 was revised to show correct surface finish call out. Added note 7 which states "For wiring of heaters and flow switches see H-6-14342. Added flag note 8 which states "Wedge PN 22 and 23 against PN 3 using PN 92 to secure PN 22 and PN 23 in place". Added note 9 which states "Some of the information on this drawing has been field

verified. For detail information of items verified see LDUA walkdown report HNF-2964". Added flag note 10 which states "Switch amplifier item 86 (3360A1A1) and riser valve position switch item 81 (3360ZS1) to be wired in accordance with NFPA 70-1996, NEC, article 504 "Intrinsically safe systems"." Added flag note 11 which states "all wiring between switch amplifier 3360A1A1 output terminals and riser valve position switch 3360ZS1 to be labeled "Intrinsically Safe Circuit"." Added note 12 which states "Switch amplifier settings: circuit 1 selector switch to 1 position, SW 3 to switch input position. Added note 13 which states "Buna-N will be the chosen material unless contact with nitric acid is anticipated, in which case the material should be viton". Assembly 1 was revised by deleting items 42, and 55. Assembly 1 was also revised by showing a cutaway view clarify spray nozzles installation.

ADDITIONAL COMMENTS:

The walkdown team could not verify metal stock material, o-ring material, and mounting hardware material.

4.50.2 H-6-14340 Sheet 2

AS FOUND:

Subassembly 2 weld symbol for welding item 24 to item 25 was incorrect since part was welded from opposite side. The subassembly also did not correctly depict the top and sides of item 26 as a hidden line. The flat pattern for item 27 was not labeled and the height of the part did not agree with specified dimension. View B-B did not indicate that it was used in 4 places.

RESOLUTION:

The detail for subassembly 2 was revised to correctly show the weld symbol for welding item 24 to item 25. The top and side of for item 26 were changed to hidden lines also on subassembly 2. View B-B was revise by adding 4 PL under the view. The flat pattern was revised by changing the width from 10.23 to 10.25 and adding the title "Flat Pattern For Item 27).

ADDITIONAL COMMENTS:

The walkdown team could not verify the raw material used to fabricate the components, any dimension shown in View A-A, the 1.75 diameter hole through item 27, or the location or diameter of the through hole in item 28, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.3 H-6-14340 Sheet 3

AS FOUND:

The flat patterns for items 25 and 26 were not identified and the flat pattern for item 24 was labeled as item 24. The detail for item 24 was not clearly identified.

RESOLUTION:

The drawing was revised by adding flat pattern titles under the flat patterns for item 24, 25, and 26. The part bubble/title was moved directly under the detail for item 24.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.4 H-6-14340 Sheet 4

AS FOUND:

The detail for item 4 did not correctly depict item 2 and did not include details for installation of radiation detectors/connector. The top view for item 4 incorrectly called out items 2 and 3. The detail for item 18 did not have dimension for outside diameter. The detail for item 19 incorrectly showed the item as a cylinder. The detail for item 20 did not identify the part as square.

RESOLUTION:

The detail for item 4 was revised to show item 2 correctly. The radiation detector was shown installed and items 21 4PL, 22 2 PL, 23 2PL, 92 4 PL, and 93 4 PL, were added. Detail views for items 22 and 23 were added to the drawing. The top view for item 4 was revised by adding REF after item 2 and 3. The detail for item 18 was revised to include 2.88 reference diameter. The detail for item 19 was revised by deleting extra line that show part as cylinder. The detail for item 20 was revised to indicate that part is square.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.5 H-6-14340 Sheet 5**AS FOUND:**

The detail for subassembly 5 did not include installation of doors, gaskets, electrical box and mounting hardware (items 14, 15, 61, 63 and numerous other parts not previously in parts list). The details for items 12, 13, and 14 had incorrect dimensions. The detail for gasket, item 15, incorrectly showed gasket as wide with holes and also showed gasket as one piece. The flat patterns for items 12 and 13 were incorrectly labeled and showed numerous incorrect dimensions.

RESOLUTION:

Subassembly 5 was revised to show the installation of the doors, gaskets, electrical box, and mounting hardware (items 14, 15, 61, 63, 94 and 95). The details for items 12 and 13 were revised by changing the 14.4 dimension for the length of the "leg" to 14.5 and changing the 14.4 dimension for squaring up the item to 14.5 reference dimension. The detail for item 12 flat pattern was revised by changing the title to "Flat Pattern For Item 12" and add "At Next Assy" to note for templating door mounting holes. The flat pattern for item 12 was also changed to correct the following dimensions; changed 20.5 to 20, changed 8.42 to 8.44 2 PL, changed the 13.48 to 13.50 2 PL, and changed 7.87 to 8.25. The flat pattern for item 13 was revised by changing the title to "Flat Pattern For Item 13". The flat pattern for item 13 was also changed to correct the following dimension; changed 12.91 to 12.88, changed 29.75 to 29.5. Also added 8.44 2PL and 13.5 2 PL to flat pattern for item 13 to dimension door cutouts. The detail for item 14 was revised by correcting the following dimensions; changed 10.42 to 10.44, changed 7.73 to 7.75, and changed 15.48 to 15.90. The detail for item 15 was corrected to show gasket as .37 wide with no holes and a note was added that states "May be Glued At Assy".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work.

6.50.6 H-6-14340 Sheet 6

AS FOUND:

No discrepancies were found

RESOLUTION:

None

ADDITIONAL COMMENTS:

Drawing was revised to change drawing to essential drawing. The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.7 H-6-14340 Sheet 7

AS FOUND:

The detail for item 32 did not clearly show that the one view was a section view and the end view had a dimension that conflicted with the dimension specified on view E. The detail for item 33 did not clearly show dimension and referred to view C. The detail for item 34 did not accurately show the part due to missing hidden lines. All the details for item 32, 33, and 34 incorrectly said 4 req'd. View F did not show that welding of the pin is done at next assembly.

RESOLUTION:

The detail for item 32 was revised by adding section T-T arrows and crosshatching was added to the section view. The end view for item 32 was relocated and the .687 dimension was deleted. The detail for item 33 was revised by including the dimension specified on view C. The detail for item 34 was revised by the addition of numerous hidden lines. The 4 req'd note was deleted for items 32, 33, and 34. View C was deleted. View F was revised by add "At Next Assy" to tail of weld symbol.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.8 H-6-14340 Sheet 8**AS FOUND:**

Item 7 did not show alignment pin installed. Subassembly 8 did not include details for the bottom plate (assy 2) and the centering plate (item 35). Subassembly 8 also incorrectly inferred that only one item 7 was required. Section H-H incorrectly called out item 54 ref.

RESOLUTION:

The detail for item 7 was revised to add item 49 and note which stated "Note, Installed Prior to Assy See Item 33 Sh 7). Subassembly 8 was revised by including installation of item 35 4 PL, pictorially adding bottom plate, adding call out for item 28 REF (SEE ASSY 2), and adding 4 PL after item 7 and in tail of weld symbol for item 7. Section H-H was revised by changing item 54 to item 35,

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify the hole diameter for item 35, however, they did verify that the specified dimension would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.9 H-6-14340 Sheet 9**AS FOUND:**

Subassembly 9 did not include installation of hold down clips for lock and did not provide any section arrows for section K-K. Item 43 had incorrect dimensions shown. Items 46 and 47 incorrectly specified dimensions for countersunk holes and incorrectly showed hole in upper corner. Section J-J did not show installation of nuts and bolts. Section K-K did not accurately depict installation of hinge or welds.

RESOLUTION:

Subassembly 9 was revised by adding section J-J, K-K, and W-W arrows, adding items 97 and 98, and adding weld symbols to install items 97 and 98. Subassembly 9 was also revised by correcting 1.13 dimension to .75 (latch clip placement) and adding note "Note: Locate Over Item 44 6 PL". Item 43 was revised by changing following dimensions; 2.38 to 2.25 and 1.0 to 1.1. Items 46 and 47 were revised by calling out countersunk holes as "5 x .266 dia thru, V .50 dia x 82 deg far side) and showing .266 thru hole with .63 edge dimensions. Section J-J was revised to include reference items 58, 59, and 60 and reference was added to items 45, 47, 48, and 57. Section K-K was revised to add weld symbol and to show section as side view with note "Match cutout in item 46 & 47 to item 50". Added details for item 97 and 98 and added section W-W.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.10 H-6-14340 Sheet 10**AS FOUND:**

Subassembly 10 did not call out items 9, 37, and 38. Item 44 on subassembly 10 did not list quantity required. Subassembly 10 did not have section arrows to refer to splash guard frame mount. Item 27 had three incorrect dimensions for hole location. Section P-P incorrectly listed all diameter dimension. Splash guard frame mount section did not show PN 9 and did not show items 38 and 44 as reference.

RESOLUTION:

The detail for subassembly 10 was revised to add items 9, 37, and 38, add section U-U arrows, and added 6 PL to item 44.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify attachment of splash guard but PNNL personnel assured us that it worked. The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown

team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.11 H-6-14340 Sheet 11

AS FOUND:

Subassembly 11 did not include items 10, the current rings, and the pilot lights. Item 78 should be reference part on subassembly 11. Item 42 was missing a dimension for height. Section R-R did not include items 8, 51, 58, 80, 81 and the bolts/washers for item 72. Section R-R also did not show quantities required for items 41, 58, 79, and 80. Section R-R incorrectly depicted the connections to the manifold. Section R-R did not show weld symbols for attachment of manifold (item 42) to enclosure (item 78). The weld symbol for welding item 10 to item 8 was pointing incorrectly in section R-R. The weld symbol for item 41 did not show that the actual weld on section R-R. Section R-R did not show item 41 on the right side and did not show how item 78 was installed.

RESOLUTION:

The detail for subassembly 11 was revised to include items 10, 90, and 91 and REF was added to item 78. The detail for item 42 was revised by add the 2.50 height dimension. Section R-R was revised to show the following; added items 8, 51, 58, 80, 81, 100, and 101, added quantities required for items 41, 58, 79, 80, 100, and 101, added note to "See View V), added weld symbol for installing item 42, corrected direction for weld symbol for installing item 10, corrected weld symbol for item 42 to 1/4 long weld, add item 41 to right side view, added note to "Template From PN 78 1/4-20UNC-2B Thru 4 PL".

Also added view V which includes items 73, 76, 77, 105, 106, and 107 to depict the details for piping connections to the manifold (item 42).

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.50.12 H-6-14340 Sheet 12

AS FOUND:

Item 70 did not include the piping connections that were installed on the part.

RESOLUTION:

The detail for item 70 was revise to include items 102, 102, and 104.

ADDITIONAL COMMENTS:

The walkdown team was not able to verify raw material used to fabricate the components. In addition, the walkdown team was unable to verify all of the dimensions, however, they did verify that the specified dimensions would work. The walkdown team was only able to verify the external form of the welds but could not fully verify the weld types.

6.51 SUMMARY OF WALKDOWN FOR H-6-14341 SHEET 1: LDUA WATER DECON TRAILER PIPING SCHEMATIC

AS FOUND:

Manufacturer and part number was incorrect for item 2. Item 5 did not identify model/part number. Hose, item 9, had crimped end connectors. Item 12 was actually a float switch. Quantity used was incorrect for items 17, 27, 30, 45, and 49. Item 32 was not used. Item 43 did not indicate that the part was modified. Item 48 did not list manufacturer and part number. The mounting plate and hardware for mounting the pump was not identified in the parts list. None of the components shown of the trailer side view or the piping layout were identified with equipment identifiers. Trailer side view did not accurately depict tank lifting lugs and did not show that insulation was installed on tank (item 52) . On the piping layout, items 30, 31, 37, 52, and 60 were identified/located incorrectly. The drawing also did not have details for the pump mounting plate and associated hardware.

RESOLUTION:

The parts list was revised to; correct manufacturer and part number for items 2, 5, and 48, added "crimped end connectors" to item 9 description, added "float switch" to item 12 description, corrected quantity used for items 17, 27, 30, 45, and 49, deleted item 32, added "modified" the item 43 description, and added pump mounting plate and associated hardware (items 34, 36, and 44). The trailer side view was revised to correctly show lifting lugs and to show that insulation

was installed on tank. The trailer side view was also revise to include the following equipment identifiers; DWSS-1, DWSS-3, FM-1 Ratemeter/totalizer, 208 VAC 15 AMP Load Decon Module Htrs, Trace Heat GFCL, and DWSS Main Input Power. The piping layout was revised to correct the location or use of items 30, 31, 37, 52, and 60. The piping layout was also revised to include the following equipment identifiers; DWSS-2, DWSS-3, DWSS-5, DWSS-7, DWSS Pump, and SV-1. The piping layout was also revised by adding a note under items 16/17/18 that states "(with drain plug)" A new detail was added to the drawing for the pump mounting plate, item 34. Added note 5 which states "The Hanford Operations Number is H0-64-3494". Added note 6 which states "The gross weight of this unit is 3100 lbs empty". Added flag note 7 which states "Use Items 334, 36, and 60 as Required to Mount all Piping and Hardware to Trailer Bed Location to be Determined at Time of Assembly". Added note 8 which states "Dimensioning and Tolerancing per ANSI Y14.5M-1982 All Dimension are in Inches Tolerances .x $\pm$.1 .xx $\pm$.01 .xxx $\pm$.010 Angular $\pm$ 2 degrees Added note 9 which states "Break all Sharp Edges". Added note 10 which states Alter Cap (Item 43) by Tapping A 3/4 N.P.T. Hole Through Center of Cap and Weld Two Handles Using 3/8 Did Rod x 2" Long 180 degrees apart". Added Note 11 which state "Some of the Information on This Drawing has Been Field Verified. For Detailed Information of Items Verified See LDUA Walkdown Report HNF-2964".

ADDITIONAL COMMENTS:

The walkdown team was not able to verify the existence, part number, or manufacturer for items 4 and 6 since these items were covered by insulation. Actual part number of other components could not be verified.

6.52 SUMMARY OF WALKDOWN FOR H-6-14342: WATER DECON POWER AND CONTROL WIRING DIAGRAM

6.52.1 H-6-14342 Sheet 1

AS FOUND:

The second through the five items in parts list did not have item numbers. The fourth and fifth items in parts list had incorrect voltages listed in description. The part/dash number was incorrect for items 2, 4, 12, 13, 14, 15, 23, 24, and 26. The designator for item 11 was incorrect. Items 20 and 33 are not used. The quantity was incorrect for item 21. The description for items 36 and 37 was incomplete. The parts list did not include the lighted push-button, solenoid valve, 46 point terminal board, SO conductor, cable connector, 12 pair shielded cable, and the cable plug. The field of drawing did not have any part bubble to identify parts. The drawing did not

show any cables, and did not show an inside view of control panel. The heat trace receptacle on the one line diagram was labeled incorrectly.

RESOLUTION:

The parts list was revised by adding items 1A through 1E for the second through the fifth items and the correct voltage was listed for items 1D and 1E. The part list was also revised to correct the part/dash number for items 2, 4, 12, 23, 24, 24, 23, 24, and 26, the designator for item 11, the quantity for item 21 and the description for items 36 and 37. Items 20 and 33 were deleted from the part list. Items 43 through 49 were added to call out missing parts. The field of drawing was revised by adding details for cables, inside view of control panel, and part bubbles for all parts. The one line diagram was revised by changing the CB-7 destination from receptacle to heat trace receptacle.

ADDITIONAL COMMENTS:

The walkdown team was able to verify all components.

6.52.2 H-6-14342 Sheet 2

AS FOUND:

The terminal block legend was incorrect for terminals 25, 26, 34, 35, 38, 39, 40, 41, and 42. The solenoid valve control diagram was incorrect. The pump motor control diagram did not show the ground wiring for the pump and did not show connection 38. The tank level interlock diagram was did not correct show the level control kit. The drawing also did not include diagram for the TRIC module heater and the piping heat trace.

RESOLUTION:

The terminal block legend was corrected for terminals 25, 26, 34, 35, 38, 39, 40, 41, and 42. The solenoid valve control diagram was revised to correct connection 25. The pump motor control diagram was revised to add the pump ground wire and to add connection 38 to diagram. The tank level interlock diagram was revised to correct the level control kit. Diagrams were added to for the TRIC module heater and piping heat trace.

ADDITIONAL COMMENTS:

None

7.0 GENERATION OF NEW DRAWINGS

As part of this activity several new drawings were generated; some of these drawings were conversions of vendor information drawings. This section contains a summary of the new drawings that were generated as a result of this activity.

7.1 SUMMARY OF NEW DRAWING H-6-14150 SHEET 1 AND SHEET 2

This new two-sheet essential drawing was developed to show the pneumatic P ID system for the LDUA and is titled PNEUMATIC SYSTEM P & ID (LDUA). This drawing shows the pneumatic system from the compressors to the At Tank Enclosure Instrument Enclosure, the routing of the purge lines and there connection with instrumentation.

7.2 SUMMARY OF NEW DRAWING H-6-14160 SHEET

This new one-sheet drawing was developed to show fabrication details and assembly of the Tooling Interface Plate Assembly which is used to mate end effectors to the LDUA arm. This drawing is a composite drawing made from PNNL drawings PL300322 (Sheets 1 through 5) the parts list from Spar Aerospace Limited and walkdown observations. Items not verified during walkdown include raw stock material and numerous internal components.

7.3 H-6-14170, LDUA SUBSYSTEM CONTROLLER PENDANT GENERAL ASSY.

This new one-sheet drawing was developed from vendor drawing 200215 and is titled LDUA SUBSYSTEM CONTROLLER PENDANT GENERAL ASSEMBLY. The drawing shows the outside view of the pendant controller which is used on the LDUA truck for moving the arm. There is a material list on the drawing for parts of the pendant and the interfacing electrical cable to the truck. Internal parts of pendant were not verified.

7.4 H-6-14171, LDUA SUBSYSTEM CONTROL PANEL GENERAL ASSY.

This new one-sheet drawing was developed from vendor drawing 200215 and is titled LDUA SUBSYSTEM CONTROL PANEL GENERAL ASSEMBLY. The drawing shows the outside view of the remote control panel assembly. There is a material list on the drawing for parts of the panel. The drawing provides the general layout and dimensions of the control panel. Not all internal parts were verified.

7.5 SUMMARY OF NEW DRAWING H-6-14172 SHEET 1 THRU SHEET 3

This new three-sheet drawing shows fabrication details and assembly of the LDUA - POWER INTERFACE MODULE which was developed from equipment walkdown. This drawing includes a material list for the frame, NEMA electrical boxes, receptacles, ground and miscellaneous parts. Sheets 1 and 2 include fabrication/assembly details and Sheet 3 includes a one line diagram and nameplate schedule. Items not verified include raw stock material and details of the H&N Electric wireway, Item 35.

7.6 SUMMARY OF NEW DRAWING H-6-14173 SHEET

This new one-sheet drawing shows details and assembly of the BOOT CLAMP, ELBOW WRIST, ASSEMBLY (LDUA). This drawing was developed from Spar Aerospace Limited Drawing #200988. Items not verified include raw stock material.

7.7 H-6-14174, LDUA SYSTEM NAMEPLATE SCHEDULE

This new 11-sheet drawing identifies all the labels on the LDUA equipment consisting of the truck, Decon trailer, At-tank Instrument Enclosure (ATIE), Operational Control Trailer (OCT), Power Distribution Skid, Purge compressors, and TRIC. These drawings were developed from a field walkdown of the equipment where all the labels were identified. Sheet one of this drawing shows the labeling key and gives a general cartoon of the equipment with reference drawing including the sheet numbers of this drawing which contains the labeling information for a particular piece of equipment. Sheets 2 and 3 identify the label script and locations for the ATIE; Sheets 4 and 5 identify the label script and locations for the OCT; Sheet 6 has the labels and locations for the power distribution skid; sheet seven has the labels and locations for the decon trailer; sheet eight has the labels and locations for the TRIC; and Sheets nine, 10, and 11 contain the label scripts and locations for the truck and purge air compressors.

7.8 H-6-14175, LDUA TRUCK POWER PURGE ELEMENTARY

This is a new two-sheet drawing developed to show the purge system for the LDUA, titled LDUA TRUCK POWER PURGE ELEMENTARY. The drawing shows the power sources and supplies for the purge system on the Deployment vehicle, the ATIE and the OCT. The elementary includes the purge sensors, relay logic, truck computer interfaces, and the interfaces between the truck, ATIE and the OCT. The information to develop the drawing comes from the vendor drawings as listed here: 200202, Sheet 6; 200205, Sheets 13, 14, and 15; 200207, Sheets

2, 3, 4, 5, 6, 7, 8, 10, 11, 15, 16, 18, 19, 22, 23, 24, 26, 27, 29, 30, 31, 33, 34, 35, 39, and 42; 200218, Sheets 2, 4, and 5; and 200234, Sheets 2 and 3. Drawing H-6-14271, Sheets 2 and 3 provided information for the ATIE purge contacts for the end effectors.

7.9 SUMMARY OF NEW DRAWING H-6-14176 SHEET 1 AND 2

This new two-sheet drawing shows details and assembly of the BOOT CLAMP, ELBOW WRIST, ASSEMBLY (LDUA). This drawing was developed from Spar Aerospace Limited Drawing #200988. Items not verified include raw stock material.

7.10 SUMMARY OF NEW DRAWING H-6-14177 SHEET 1

This new two-sheet drawing shows the schematic diagram of the LDUA OUTRIGGER HYDRAULIC SCHEMATIC. This drawing was developed from a copy of Lasociete Basic Technologies drawings 2371 and 2382. Items not verified include numerous vendor parts due to inaccessibility.

7.11 SUMMARY OF NEW DRAWING H-6-14180 SHEET 1 AND 2

This new two-sheet drawing shows the called the BRAKE PLATFORM MOBILE DEPLOYMENT SYSTEM (LDUA) shows details of the folding platforms used to gain access to the mast brake mechanism. This drawing was developed from Spar Aerospace Limited Drawing #200278-2.

8.0 OPEN ITEM CHECKLISTS

This section contains the Open Item Checklist, used to document specific drawing problems/issues that were not closed prior to the release of the direct revision ECNs. These items require specific resolution, some of which have since been resolved and are closed. The remaining open items will be resolved and their final dispositions documented through a page change revision to the section 8.0 checklist.

OPEN ITEM CHECKLIST

Sheet 1 of 1

Document Number: PNL200277 Sheet 1 Revision Number: __0

System: Y - FRAME MDS LDUADS Area: 400 Building: FMEF

[illegible]

OPEN ITEM CHECKLIST

Sheet 1 of 1

Document Number: H-6-14242 Sheets 1&2 Revision Number: 0

System: HIGH RESOLUTION STEREOSCOPIC VIDEO Area: 400 Building: FMEF
CAMERA SYSTEM (HRSVS)

[illegible]

OPEN ITEM CHECKLIST					
Document Number: H-6-14177 Sheets 1&2 Revision Number: 0 (new drawing)					
System: LDUA OUTRIGGER HYDRAULIC SCHEMATIC Area: 400 Building: FMEF					
Item No.	Affected Component, Line, or ID Number	Field Sheet No.	Open Item Description	Disposition	Status
1	Item 53 Ball valve	1	There is not a part manufacturer or part number identified on the drawing	Vendor data will be obtained and an ECN will be prepared to include outrigger configuration on the drawing	Open
2	Item 54 Valve, manual 2 position 3 way	1	There is not a part manufacturer or part number identified on the drawing	Vendor data will be obtained and an ECN will be prepared to include outrigger configuration on the drawing	Open
3	Item 55 Valve manifold, manual, 6spool, 3 position, 4 way	1	There is not a manufacturers part number identified on the drawing	Vendor data will be obtained and an ECN will be prepared to include outrigger configuration on the drawing	Open
4	Item 56 Valve manifold, manual, 4 spool, 3 position, 4 way	1	There is not a manufacturers part number identified on the drawing	Vendor data will be obtained and an ECN will be prepared to include outrigger configuration on the drawing	Open
5	Item 57 Hydraulic cylinder outrigger	1	There is not a part manufacturer or part number identified on the drawing	Vendor data will be obtained and an ECN will be prepared to include outrigger configuration on the drawing	Open
6	Item 58 Hydraulic cylinder lift	1	There is not a part manufacturer or part number identified on the drawing	Vendor data will be obtained and an ECN will be prepared to include outrigger configuration on the drawing	Open

OPEN ITEM CHECKLIST

Sheet 2 of 2

Document Number: H-6-14177 Sheets 1&2 Revision Number: 0 (new drawing)

System: LDUA OUTRIGGER HYDRAULIC SCHEMATIC Area: 400 Building: FMEF

[illegible]

OPEN ITEM CHECKLIST

Sheet 1 of 1

Document Number: H-6-14160 Sheet 1 Revision Number: 0 (new drawing)
 System: TOOLING INTERFACE PLATE Area: 400 Building: FMEF
 ASSEMBLY (LDUA)

Item No.	Affected Component, Line, or ID Number	Field Sheet No.	Open Item Description	Disposition	Status
1	Assembly General note 4	1	This note requires cleaning, handling, and storage per PCR 10:01, Type II, which is not a PHMC procedure.	Spar will be contacted to obtain their procedures. The drawing will then be updated to list PHMC procedures, as required.	Open
2	Assembly Flag note 5	1	This note requires assembly per PCR 16:01, Method III, which is not a PHMC procedure	Spar will be contacted to obtain their procedures. The drawing will then be updated to list PHMC procedures, as required.	Open
3	Assembly Flag note 6	1	This note requires assembly per PCR 16:01, Method V, which is not a PHMC procedure	Spar will be contacted to obtain their procedures. The drawing will then be updated to list PHMC procedures, as required.	Open
4	Assembly Flag note 7	1	This note requires torquing of fasteners per 1000B13, which is not a PHMC procedure	Spar will be contacted to obtain their procedures. The drawing will then be updated to list PHMC procedures, as required.	Open
5	Assembly Flag note 11	1	This note requires application of filler material per PCR 07:04, which is not a PHMC procedure	Spar will be contacted to obtain their procedures. The drawing will then be updated to list PHMC procedures, as required.	Open

OPEN ITEM CHECKLIST

Sheet 1 of 2

Document Number: H-6-14173 Sheet 1 Revision Number: 0 (new drawing)
 System: BOOT CLAMP ELBOW, WRIST, Area: 400, Building: FMEF
 ASSEMBLY (LDUA)

Item No.	Affected Component, Line, or ID Number	Field Sheet No.	Open Item Description	Disposition	Status
1	Assembly Flag note 5	1	This flag note requires that the item be identified per 05:01, method B, which is not a PHMC procedure.	Spar will be contacted to obtain their procedures. The drawing will then be updated to list PHMC procedures, as required.	Open
2	Assembly General note 7	1	This note requires cleaning, handling, and storage per PCR10:01, Type II, which is not a PHMC procedure	Spar will be contacted to obtain their procedures. The drawing will then be updated to list PHMC procedures, as required.	Open
3	Item 5 Upper Pin	1	The information used to create this drawing did not reflect any other material of construction than Polyvinyl chloride ASTM D2740. This component was assumed to be made of stainless steel but could not be verified.	This item will be reviewed to determine correct material call-outs. The drawing will then be changed, if required	Open
4	Item 6 Lower Pin	1	The information used to create this drawing did not reflect any other material of construction than Polyvinyl chloride ASTM D2740. This component was assumed to be made of stainless steel but could not be verified.	This item will be reviewed to determine correct material call-outs. The drawing will then be changed, if required	Open
5	Item 9 Screw, socket hd cap, #2-56 UNC-3A x 1 long	1	The information used to create this drawing did not reflect any other material of construction than Polyvinyl chloride ASTM D2740. This component was assumed to be made of stainless steel but could not be verified.	This item will be reviewed to determine correct material call-outs. The drawing will then be changed, if required	Open

APPENDIX A

Interoffice Memo 73500-98-020

MODIFICATION TASK ORDER
COVERSHEET - HANFORD TANKS INITIATIVE
LIGHT-DUTY UTILITY ARM DEPLOYMENT, REVISION 3

INTEROFFICE MEMO

LOCKHEED MARTIN

From: Hanford Tanks Initiative
 Phone: 373-1328 H6-12
 Date: May 27, 1998
 Subject: MODIFICATION TASK ORDER COVERSHEET - HANFORD TANKS INITIATIVE
 LIGHT-DUTY UTILITY ARM DEPLOYMENT, REVISION 3

73500-98-020

To: L. N. Cortez H7-07

cc: R. M. Boger S7-12*
 H. L. Boston G3-21
 D. L. Burt G3-21
 K. S. Hoeft H7-08*
 J. J. Huston H5-61*
 K. E. McKinney H5-03
 A. F. Noonan K9-91
 E. M. Northrop H6-12*
 R. W. Powell H5-03
 T. E. Rainey H6-12*
 R. W. Root H6-12*
 P. S. Schaus H6-12*
 HTI Project File H6-12*
 HTI Working File H6-12*
 TWR DIMC H6-15*
 RWR File/LB*
 * w/attachment

The attached task order and statement of work modifications hereby supplement COGEMA Engineering, Inc. (contract number KKH-SLB-A42234) funding for \$97,000 in support of light-duty utility arm drawing walk down and correction.

If you have any questions or require further information, please contact Mr. Tom Rainey at 373-3531.

R. W. Root

R. W. Root
 Manager

slv

Attachments 2

73500-98-020

Record Note:

Inpreparation for the modification to Task Order A42234-105 with COGEMA Engineering for completion of Light Duty Utility Arm (LDUA) drawing walkdown and correction, and LDUA software configuration, I discussed the scope of work and estimated cost with R. M. Boger, Manager Characterization Engineering; G. P. Janicek, Characterization Design Authority; and C. A. Esvelt, LDUA Cognizant Engineer; and the quality assurance requirements with J. J. Huston.

T. E. Rainey

ATTACHMENT 1
73500-98-020
Consisting of 1 page (excluding coversheet)

M O D I F I C A T I O N
PURCHASE ORDER: Cogema Eng. KKH-SLB-A42234

TASK ORDER COVERSHEET

Task Order Number: A42234-105, Rev. 3 Date: May 27, 1998
(assigned by Buyer's Technical Rep.)

Task Title: HTI LDUA Deployment, Drawing Walkdown and Correction

Author: T. E. Rainey Telephone/Fax: 373-3531/373-6101

Program Title: Hanford Tanks Initiative, Retrieval Program

Charge Code: D25K2 Org. Code: 73500 Estimated Cost: \$ 97,000

Previously Authorized Amount: \$ 129,000

New Total: \$ 226,000

Period of Performance: May 26, 1998 - July 31, 1998

Brief Description of Work Scope: This task order was previously authorized on 5/14/98. This modification increases the scope of work to include the attached statement of work and clarifies the quality assurance requirements for Rev. 2. Task Order Attachment Checklist

Scope of Work X

Schedule X

Deliverables/Required Documents X

Special Contractual Requirements X

Approval Designator: (circle) E S Q D NA

Signature: NA

(required if applicable to E=Environment, S=Safety, or Q=Quality;
D=DQE approval; NA=No Approval required; see CM 3-5, 12.7)

Approved By:

Author: T. E. Rainey *[Signature]* Date: 5/27/98

Financial Rep.: E. M. Northrop *[Signature]* Date: 5/27/98

Author's Manager/CAM: R. W. Root *[Signature]* Date: 5/27/98 *[Signature]*

Buyer's Tech. Rep.: _____ Date: _____

to-1duu3.mod

ATTACHMENT 2
73500-98-020
Consisting of 39 pages (excluding coversheet)

Statement of Work, Revision 3, Dated May 22, 1998

LDUA DRAWING WALKDOWN AND CORRECTION

OBJECTIVE

The objective is to provide a field-verified set of drawings for operation and routine maintenance of the Light Duty Utility Arm (LDUA).

BACKGROUND

The LDUA system has, over the course of its development, caused the generation of a considerable number of design drawings. The number of drawings is estimated to be well over 1000. A large number consist of vendor type drawings, both PNNL and SPAR-furnished. A smaller number, approximately 200, are H-6 type drawing sheets in our document control system, prepared, for the most part, by PNNL. The recent revelation that a few drawings in each of these categories did not match the physical configuration of the LDUA system was cause for concern and precipitated the referenced scoping walkdown to determine if the initial finding was an anomaly or represented a larger problem in configuration management. The scoping walkdown selected, somewhat randomly, a set of 20 critical type drawings to assess against the physical hardware. As a result of this activity, 18 of the 20 drawings were found to contain errors or omissions of varying concern. Given this, Characterization Engineering decided that a full walkdown of drawings was necessary. Engineering and Operations have determined that a walkdown of all existing drawings is unwarranted. The walkdown scope should be the set of drawings necessary and sufficient to enable safe operation and maintenance of the LDUA. Criteria were established with which to review all existing drawings and define this necessary and sufficient set. The criteria established were the following:

- Drawings necessary for proper operation within the Authorization Basis
- Drawings depicting information on proper interfacing with the tanks
- Drawings necessary for ensuring personnel safety
- Drawings required to recover the LDUA from the tank in case of failure
- Drawings necessary for performing preventive maintenance
- Drawings necessary for critical maintenance and troubleshooting essential to mission success, i.e., tool interfaces, manual end-effector exchange system.

A review of all drawing sheets was completed on April 29, 1998. The review team included the following personnel: G. A. Barnes, K. L. Bennett (PNNL LDUA team), C. A. Esvelt (Characterization Cognizant Engineer), G. P. Janicek, D. B. Niebuhr (Characterization Operations PIC), and F. A. Schmorde (Characterization Operations Shift Supervisor).

Drawings were evaluated against the criteria listed above to select the drawings comprising the

necessary set. These results will be documented in a future report.

WORK SCOPE

The drawings to be walked down and corrected or new drawings to be created are as follows:

- 149 existing H-6 drawing sheets
- 12 SPAR/PNNL drawing sheets (to be converted to H-6 drawing sheets)
- 3 to 6 new H-6 drawing sheets which will include selected information verified from additional PNNL/SPAR drawings

A listing of the known drawings requiring walkdown (attached) constitutes the scope of the walkdown. This scope may be altered pending issuing the report of the drawing review and selection effort.

A walkdown team shall be formed with a team leader to perform a walkdown of the identified drawings scope. The team should involve appropriate members of the LDUA development. The walkdown shall be conducted and documented per HNF-IP-0842, Vol. IV, Sec. 3.13. "Performing Walkdowns." Walkdown documentation shall, as a minimum, include a "walkdown checklist"; a "summary status listing" of items needed to be corrected by ECN, itemized by each individual drawing walked down (and/or H-6 to be created); and a "drawing file" consisting of all original "redlined" drawing sheets used during the walkdown. All documentation shall be included in an approved/issued walkdown report.

Following the walkdown the team shall generate ECNs to correct discrepancies found, incorporate ECNs into the drawings, and generate new drawings identified in the scope. This work shall be conducted in accordance with HNF-PRO-440.

REQUIREMENTS

The team shall consist of technical personnel meeting the following requirements:

- Experience working with Hanford TWRS Engineering procedures for drawings and configuration control.
- Familiarity with LDUA (preferred)
- Experience with conducting drawing walkdowns in accordance with TWRS procedure HNF-IP-0843, Vol. IV, Sec. 3.13, "Performing Walkdowns."
- Recent experience with the previous limited walkdown of LDUA drawings (preferred).

The walkdown shall be conducted and results documented in accordance with HNF-IP-0842, Vol. IV, Sec. 3.13, "Performing Walkdowns."

Writing of ECNs, incorporating ECNs into drawings, and generating new drawings shall be in accordance with HNF-PRO-440.

DELIVERABLES

Report of the walkdown, issued as a supporting document (SD).

ECNs, updated drawings, and new drawings as described in the work scope.

Weekly reports of progress, including team leader representations at a weekly status meeting.

SCHEDULE

The work will commence immediately. The walkdown including SD report should be completed by July 15, 1998.

ECNs and new drawings shall be completed by July 7, 1998.

Updating of drawing to incorporate ECNs should be completed by July 31, 1998.

Efforts shall be made to complete the work ahead of schedule.

QUALITY ASSURANCE

Work performed for HTI Characterization tasks shall be accomplished in accordance with the requirements set forth in the Project Hanford Quality Assurance Program Description (QAPD), HNF-MP-599, Rev.1, for nuclear facilities.

LDUA Drawing Review

Spar Aerospace Limited - LDUA System Drawings

Subsystem 2000							
Drawings	AB	TI	PS	R	PH/C	CM	Comments
200163-1: COVER MANIFORD, SHOULDER ASSY, LDUA							Components inside purged volume
PNL200163-2: COVER, MANIFORD, SHOULD ASSY, LDUA							Components inside purged volume
PNL200164-1-3: STRUCTURE, MAIN SHOULDER ASSY LDUA	✓	✓					Components exposed to tank content, material information will be added to H-series drawing
PNL200165-1: RETAINING RING, SPT, CAMERA/LIGHTS, LDUA							Components inside purged volume
PNL200166-1-6: CAMERA/LIGHT ASSEMBLY, SHOULDER, LDUA "PARTS LIST"	✓	✓					Components exposed to tank contents, material information will be added to H-series drawing
200166-1: CAMERA/LIGHT ASSY, SHOULDER, LDUA	✓	✓					Components exposed to tank contents, material information will be added to H-series drawing
200167-1: ROD END, CUSTOM, CAMERA/LIGHT, LDUA							Components inside purged volume
200168-1: ADAPTER, RESOLVER, YAW DRIVE, LDUA							Components inside purged volume
200169-1: SHAFT, RESOLVER, YAW DRIVE, LDUA							Components inside purged volume
200169-1: SHAFT, RESOLVER, YAW DRIVE, LDUA							Components inside purged volume

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CH	Comments
200170-1: SPACER. RING. SHOULDER ASSY LDUA							Components inside purged volume
200171-1&2: YOKE. WRIST. LDUA							Components inside purged volume
200172-1: CLEVIS. PITCH CYL WRIST. LDUA							Components inside purged volume
200173-1: CLEVIS. YAW CYL. WRIST. LDUA							Components inside purged volume
200174-1&2: HOUSING. PITCH. WRIST. LDUA							Components inside purged volume
200175-1: COVER. ROLL. WRIST. LDUA	✓	✓					Components exposed to tank content. material information will be added to H-series drawing
200176-1: ARM. PIVOT. WRIST. LDUA							Components inside purged volume
200177-1: LINK. WRIST. LDUA							Components inside purged volume
200178-1: GEAR. ROLL. WRIST ASSEMBLY. LDUA							Components inside purged volume
200179-1: PINION. ROLL. WRIST ASSEMBLY. LDUA							Components inside purged volume
200180-1: SHELL. BEARING. WRIST ASSY. LDUA	✓	✓					Components exposed to tank content. material information will be added to H-series drawing
200181-1: HOUSING. ROLL. WRIST ASSY. LDUA	✓	✓					Components exposed to tank content. material information will be added to H-series drawing
200182-1: RETAINER. RESOLVER. WRIST. LDUA							Components inside purged volume
200184-1&2: CLEVIS. YAW. WRIST. LDUA	✓	✓					Components exposed to tank content. material information will be added to H-series drawing

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200185-1-3: CLEVIS, PITCH, WRIST, LDUA							Components inside purged volume
200186-1: CLAMP, RESOLVER, SHAFT, WRIST ASSY, LDUA							Components inside purged volume
200187-1-3: HOUSING, YAW, WRIST, LDUA							Components inside purged volume
200188-1&2: COVER, YAW, WRIST, LDUA							Components inside purged volume
200189-1: MOUNT, PITCH, CYLINDER, WRIST, LDUA							Components inside purged volume
200190-1: SPACER, INNER WRIST LDUA							Components inside purged volume
200191-1: CYLINDER, YAW, WRIST, LDUA							Components inside purged volume
200192-1: CYLINDER, PITCH, WRIST, LDUA							Components inside purged volume
200193-1: SHAFT, RESOLVER, WRIST ASSY, LDUA							Components inside purged volume
PL200194-1-14: WRIST ASSEMBLY "PARTS LIST"							Components inside purged volume
200194-1-4: WRIST ASSEMBLY, LDUA							Components inside purged volume
PL200233-1&2: LDUA ATIE I/F UNIT ASSEMBLY "PARTS LIST"	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing.
PNNL200233-1: AT TANK INSTRUMENT ENCLOSURE INTERFACE UNIT ASSY	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing.

Subsystem 2000							
Drawings	AB	TI	PS	R	PH/C	CM	Comments
200234-1&3: AT TANK INSTRUMENT ENCLOSURE (ATIE) INTERFACE KIT SCHEMATIC	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing.
200235-1&2: LDUA MDS HYDRAULIC CONTROL MODULES - CABLE ASSEMBLIES							Components inside purged volume
200239-1: PLATE, MEMBRANE ELBOW LDUA							Components inside purged volume
200248-1: SPACER, SEAL ELBOW LDUA							Components inside purged volume
200249-1: SHIM SPACER, SEAL ELBOW INNER,MIDDLE LDUA							Components inside purged volume
PL200250-1&7:ELBOW ASSEMBLY, LDUA							Components inside purged volume
200250-1&2 ELBOW, ASSEMBLY, LDUA LDUADS							Components inside purged volume
200252-1: BRACKET, MANIFOLD, SHOULDER, ELBOW LDUA							Components inside purged volume
200258-1: RETAINER, SEAL, WRIST, LDUA							Components inside purged volume
200259-1: FORCE MOMENT SENSOR, WRIST, LDUA							Components inside purged volume
200260-1: PIN, WRIST ASSEMBLY, LDUA							Components inside purged volume
200261-1: RETAINER, BEARING, WRIST, LDUA							Components inside purged volume
PNL200262 1&2: FRAME ASSEMBLY VPM LDUA							
200265-1&2: OUTER TUBE ASSEMBLY VPM LDUA							

Subsystem 2000							
Drawings	AB	TI	PS	R	PH/C	CM	Comments
PNL200276-1: X-RAME MDS LDUAOS							
200702-1: CLAMP, #3. WRIST ASSY. YAW END, LDUA							Components inside purged volume
200703-1: CLAMP, #4. WRIST ASSY. TIP END, LDUA							Components inside purged volume
200705-1: BRACKET, CLAMP, WRIST ASSY. TIP END, LDUA							Components inside purged volume
200736-1: STRAP, #1 SHOULDER ASSY, LDUA							Components inside purged volume
200737-1: STRAP, #2. SHOULDER ASSEMBLY, LDUA							Components inside purged volume
200738-1: STRAP #3. SHOULDER ASSEMBLY, LDUA							Components inside purged volume
200739-1: STRAP ASSY, STRAP ASSY, UMBILICAL, ELBOW LDUA							Components inside purged volume
200740-1: STRAP ASSY, STRAP ASSY, UMBILICAL, WRIST, LDUA							Components inside purged volume
200741-1: CLAMP, UMBILICAL, ELBOW, LDUA							Components inside purged volume
200742-1: CLAMP, UMBILICAL, WRIST, LDUA							Components inside purged volume
200769-1: CLAMP, SMALL, SHOULDER, YAW, LDUA							Components inside purged volume
200770-1: CLAMP, LARGE, SHOULDER, YAW, LDUA							Components inside purged volume
200771-1: SLEEVE, CRIMP, SHOULDER, YAW, LDUA							Components inside purged volume
200772-1: CLAMP, #1, WRIST ASSY. YAW END, LDUA							Components inside purged volume
200773-1: CLAMP, #2, WRIST ASSY. YAW END, LDUA							Components inside purged volume
200774-1: BRACKET, SUPPORT, SHOULDER ASSEMBLY, LDUA							Components inside purged volume

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200195-1: RESOLVER, MODIFIED, YAW DRIVE, LDUA							Components inside purged volume
200198-1: KEY, RING, SHOULDER ASSEMBLY LDUA							Components inside purged volume
200199-1: YAW DRIVE ASSEMBLY, SHOULDER, LDUA	✓	✓					Components exposed to tank content, material information will be added to H-series drawing
PL200200-1-10: SHOULDER ASSEMBLY, LDUA	✓	✓					Components exposed to tank content, material information will be added to H-series drawing
200200-1&2: SHOULDER ASSEMBLY, LDUA	✓	✓					Components exposed to tank content, material information will be added to H-series drawing
200202-1-10: LDUA SYSTEM INTERCONNECT DIAGRAM	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing.
200203-1-12: LDUA SHOULDER CABLE HARNESS SCHEMATIC							
200204-1-11: LDUA CABLE HARNESS SCHEMATIC							
200205-1-15: LDUA VPM CABLE HARNESS SCHEMATIC	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing
200206-1-3: LDUA HYDRAULIC CONTROL MODULE HARNESSES SCHEMATIC							

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200207-1-44: LDUA SUBSYSTEM CONTROLLER SCHEMATIC/INTERCONNECTION	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing
200208-1&2: LDUA SUBSYSTEM CONTROLLER GENERAL ASSY							
PL200208-1-23: LDUA SUBSYSTEM CONTROLLER "PARTS LIST"	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing
200209-1-3: LDUA SUBSYSTEM CONTROLLER INTERNAL CABLE ASSEMBLIES	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing
200210-1-4: SHOULDER CABLE ASSEMBLY							
200211-1-4: LDUA SUBSYSTEM CONTROLLER EXTERNAL CABLE ASSEMBLIES	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing
200212-1-3: LDUA CABLE ASSY							
200213-1: LDUA BATTERY SUBSYSTEM GENERAL ASSEMBLY							

Subsystem 2000							
Drawings	AB	TI	PS	R	PH/C	CH	Comments
200213-1&2: LDUA BATTERY SUBSYSTEM ASSEMBLY "PARTS LIST"							
200214-1&2: LDUA BATTERY SUBSYSTEM SCHEMATIC/INTERCONNECTION							
200215-1-3: LDUA SUBSYSTEM CONTROLLER PENDANT GENERAL ASSY						✓	
PL200215-1&2: LDUA PENDANT ASSEMBLY "PARTS LIST"						✓	
200216-1&2: LDUA SUBSYSTEM CONTROLLER PENDANT GENERAL ASSY							
200218-1-5: LDUA CONSOLE SUBSYSTEM INTERFACE UNIT SCHEMATIC/INTERCONNECTION							
200219-1: LDUA CONSOLE SUBSYSTEM JOYSTICK CABLE ASSEMBLY							
200220-1-3: LDUA ATIT KIT I/F UNIT CABLE ASSEMBLIES							
200221-1: LDUA CONSOLE SUBSYSTEM CONTROL PANEL GENERAL ASSY						✓	
PL200221-1&2: LDUA CONSOLE PANEL ASSEMBLY "PARTS LIST"						✓	
200222-1&2: LDUA CONSOLE SUBSYSTEM CONTROL PANEL SCHEMATIC/INTERCONNECTION							
200225-1-5: LDUA VPM CABLING GENERAL ASSY							
200226-1-3: LDUA SYSTEM CABLES ASSY	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200227-1-6: LDUA SYSTEM CABLES SCHEMATICS	✓						Some components are part of the purge system interlock. The components related to the purge system will be identified on a new purge gas system wiring diagram that will be released as a H-series drawing
PNL200277-1: Y-FRAME MDS LDUA			✓				
PNL200278-1: ROLL FRAME MDS LDUA			✓				
PNL200278-2: BRAKE PLATFORM MDS LDUA			✓				
PNL200280-1&2: BASE-FRAME MDS LDUA							
200281-1: VPM SUPPORT FRAME MDS LDUA							
200285-1: KEY, SHAFT, SHOULDER ASSY. LDUA							Components inside purged volume
200286-1: PLATE, HARDSTOP, CAMERA/LIGHT. LDUA							Components inside purged volume
200288-1: DOWEL RETAINER, ELBOW, LDUA							Components inside purged volume
200289-1: DOWEL RETAINER, ELBOW, LDUA							Components inside purged volume
200293-1: MEMBRANE, RESOLVER SHOULDER LDUA							Components inside purged volume
200294-1: ADAPTOR, RESOLVER SHOULDER LDUA							Components inside purged volume
200295-1: HOUSING, BEARING SHOULDER LDUA							Components inside purged volume
200296-1: HOUSING, RESOLVER, SHOULDER, LDUA							Components inside purged volume
200297-1: COVER, RESOLVER SHOULD LDUA							Components inside purged volume

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200298-1: PIN, IGH BKT. CAMERA/LIGHT. LDUA							Components inside purged volume
200299-1: PIN, TILT. CAMERA. LIGHT. LDUA							Components inside purged volume
200300-1: PIN. LINKAGE. CAMERA/LIGHT. LDUA							Components inside purged volume
PNL200301-1&2: PLATE, TIP ASSEMBLY LDUA							
PNL200302-1&2: PLATE, TIP END EFFECTOR. LDUA							Components inside purged volume
PNL200303-1: MOUNTING PLATE, TIP. TIP ASSEMBLY LDUA							Components inside purged volume
200309-1: BRACKET, SPROCKET, CAMERA/LIGHT LDUA							Components inside purged volume
200314-1: BUSHING, TIP. TIP ASSY LDUA							Components inside purged volume
200315-1: PLATE, MOUNTING, TIP ASSY. LDUA							Components inside purged volume
200316-1&2: SHAFT, TIP. TIP ASSY. LDUA							Components inside purged volume
200317-1: BUSHING, SHAFT, TIP ASSY. LDUA							Components inside purged volume
200319-1: WASHER, THRUST, TIP ASSY. LDUA							Components inside purged volume
200320-1: STUD, TIP. TIP ASSY. LDUA							Components inside purged volume
200321-1: TOOL. CAM INTALLATION TIP ASSY. LDUA							Components inside purged volume
PL200322-1-5: TOOLING INTFC PLATE ASSY. LDUA	✓					✓	
PNL200322-1: TOOLING INTERFACE PLATE ASSY LDUA	✓					✓	
200323-1: PIN, QUICK RELEASE, TIP ASSY. LDUA							Components inside purged volume

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200337-1&2: BOOT KIT LDUA ASSY LDUA							Components inside purged volume
200339-1: SPACER, OUTER, SHOULDER ASSY LDUA							Components inside purged volume
200340-1: COUPLER, TIP ASSY, LDUA							Components inside purged volume
200341-1: NIPPLE, TIP ASSY LDUA							Components inside purged volume
200353-1&2: SEALS, PROTECTIVE VPM LDUADS							
PNL200353-3: SEALS, PROTECTIVE VPM LDUADS	✓						Components exposed to tank content. material information will be added to H-series drawing
PL200366-1&2: LDUA ASSY. LDUADS							
PNL200366-1: LDUA ASSY LDUADS							
200377-1: SHIM, BEARING SHOULDER LDUA							Components inside purged volume
200408-1: WASHER, TIP ASSY, LDUA							Components inside purged volume
200409-1: SPACER, TOOL, TIP ASSY, LDUA							Components inside purged volume
200410-1: SPACER, COUPLER, WRIST ASSY, LDUA							Components inside purged volume
200411-1: NUT, TOOL, TIP ASSY, LDUA							Components inside purged volume
200453-1: THRUST WASHER, NIPPLE, TIP ASSY, LDUA							Components inside purged volume
200484-1: NUT, INNER, SHOULDER ASSY, LDUA							Components inside purged volume
200485-1: NUT, OUTER, SHOULDER ASSY, LDUA							Components inside purged volume

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200486-1: FLANGE, MOUNTING, YAW DRIVE, LDUA							
200492-1: BUSHING, YAW DRIVE LDUA							Components inside purged volume
200493-1: SPACER, SHOULDER ASSY, LDUA							Components inside purged volume
200514-1: HARDSTOP, WRIST ASSY LDUA							Components inside purged volume
200515-1: KDY, HARDSTOP, WRIST ASSY, LDUA							Components inside purged volume
200516-1: RING, FLOATING, WRIST ASSY, LDUA							Components inside purged volume
200517-1: SPACER, HARDSTOP, WRIST ASSY, LDUA							Components inside purged volume
200521-1: HUB, RESOLVER, SRIST ASSY, LDUA							Components inside purged volume
200522-1: WASHER, THRUST, WRITS ASSY, LDUA							Components inside purged volume
200523-1: ARM, CLAMP WRIST ASSY, LDUA							Components inside purged volume
200524-1: SPACER, ARM, WRIST ASSY, LDUA							Components inside purged volume
200629-1: BASE, ASSY, ROLLER ASSY, VPM LDUA							Components inside purged volume
200630-1: PLATE, END ROLLER ASSY, VPM LDUA							Components inside purged volume
200631-1: PLATE, ROCKER, ROLLER ASSY, VPM LDUA							Components inside purged volume
200632-1: SHAFT, ROLLER ASSY, VPM LDUA							Components inside purged volume
200633-1: ROLLER, ROLLER ASSY, VPM LDUA							Components inside purged volume
200634-1: SHAFT, ROLLER, ROLLER ASSY, VPM LDUA							Components inside purged volume

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200635-1: SPACER, ROLLER ASSY, VPM LDU A							Components inside purged volume
200636-1: BASE, ROLLER ASSY, VPM LDU A							Components inside purged volume
200637-1: PLATE, ROCKER, ROLLER ASSY, VPM LDU A							Components inside purged volume
200638-1: SHAFT, ROLLER ASSY, VPM LDU A							Components inside purged volume
200639-1: BASE, ASSY, VPM LDU A							Components inside purged volume
200691-1: ADAPTER, YAW DRIVE ASSY, LDU A							
PNL200743-1: CLAMP, UMBILICAL, ELBOW, LDU A							Components inside purged volume
PNL200744-1: CLAMP, UMBILICAL WRIST, LDU A							Components inside purged volume
PNL200745-1: CLAMP, UMBILICAL, WRIST, LDU A							Components inside purged volume
200746-1: CLAMP, UMBILICAL, LDU A							Components inside purged volume
200800-1: CLAMP, LARGE, SHOULDER ASSY, LDU A							Components inside purged volume
200801-1: CLAMP, SMALL, SHOULDER ASSY, LDU A							Components inside purged volume
200803-1: CLAMP, MEDIUM, SHOULDER ASSY, LDU A							Components inside purged volume
200812-1: BRACKET, SUPPORT, VPM, LDU A							Components inside purged volume
200813-1: BRACKET, SUPPORT, VPM, LDU A							Components inside purged volume
200814-1: BRACKET, SUPPORT, VPM, LDU A							Components inside purged volume
200815-1: BRACKET, SUPPORT, VPM, LDU A							Components inside purged volume

Subsystem 2000							
Drawings	AB	TI	PS	R	PH/C	CM	Comments
200816-1: CLAMP, CABLE, VPM, LDUA							Components inside purged volume
200817-1: BRACKET, SUPPORT, VPM, LDUA							Components inside purged volume
200818-1: BRACKET, SUPPORT, VPM, LDUA							Components inside purged volume
200819-1: BRACKET, MICROSWITCH, VPM, LDUA							Components inside purged volume
200822-1: CLAMP, CABLE, VPM, LDUA							Components inside purged volume
200823-1: CLAMP, CABLE, VPM, LDUA							Components inside purged volume
200824-1: BRACKET, SUPPORT, VPM, LDUA							Components inside purged volume
200825-1: PLUNGER ASSY, VPM, LDUA							Components inside purged volume
200988-1: CLAMP, BOOT, ELBOW, WRIST, ASSY, LDUA						✓	
PNL97040-1: HOLDER, LASER PEN LASER ALIGNMENT RING LDUA						✓	
201114-1: PLATE, END, OUTER TUBE, LDUA							Components inside purged volume
201115-1: PLATE, END, INNER TUBE, LDUA							Components inside purged volume
201116-1: TUBE, OUTER, END DETAIL, LDUA	✓						Components exposed to tank content. material information will be added to H-series drawing
201117-182: TUBE, INNER, END DETAIL, LDUA							Components inside purged volume
200078-8: OUTER TUBE DETAIL OF WELDED JOINT & SEAL HOUSING							
200078-9: MAIN FRAME VPM MAIN BEAM WELD PREP							

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200078-10: MAIN FRAME-VPM GUSSET							
200078-11: MAIN FRAME-VPM GUSSET							
200078-12: MAIN FRAME-VPM WELDED JOINT BRACE							
200078-15: MAIN FRAME-VPM BRAKE TUBE WELD PREP							
200078-14: MAIN FRAME VPM BRAKE PLUG							
200078-18: MAIN FRAME-VPM BEARING JOURNAL							
200078-19: MAIN FRAME-VPM BRG JOURNAL HOUS'G							
200078-20: MAIN FRAME-VPM CROSS SHAFT FITTING							
200078-21: MAIN FRAME-VPM CROSS SHAFT TUBE							
200078-22: MAIN FRAME-VPM CROSS SHAFT FITTING							
200078-23: MAIN FRAME-VPM CROSS SHAFT NOT							
200078-25: MAIN FRAME-VPM BRAKE BRG GUSSET							
200078-26: MAIN FRAME-VPM BRAKE BRG GUSSET							
200078-27: MAIN FRAME-VPM BRAKE TUBE GUSSET							
200078-28-1: MAIN FRAME-VPM OUTER STAGE BRG							
200078-28-2: MAIN FRAME-VPM OUTER STAGE BRG							
200078-28-3: MAIN FRAME-VPM OUTER STAGE BRG							

Subsystem 2000							
Drawings	AB	TI	PS	R	PH/C	CM	Comments
200078-29: MAIN FRAME-VPM FLOOR PLATES							
200078-30: MAIN FRAME-VPM EYE BOLT SPACER							
200078-32: MAIN FRAME-VPM OUTER BRAKE PAD							
200078-33: MAIN FRAME-VPM BRAKE PAD INSERT							
200078-34: MAIN FRAME-VPM FINISH MACH BRK SHAFT							
200078-37: WINCH BRACKET MAIN FRAME-VPM							
200078-41: MAIN FRAME-VPM PROTECTIVE SEAL							
200078-42: MAIN FRAME VPM WIPER CLAMP							
200078-42: ORIGINAL MAIN FRAME VPM WIPER CLAMP							
200078-43: MAIN FRAME-VPM END PLATE							
200078-44: MAIN FRAME-VPM GATE VALVE PLATE							
200078-45: KEY, TONGUE&GROOVE OUTER TUBE							
200078-48: MAIN FRAME-VPM END CAP							
200078-55: OUTER TUBE, GUIDE ROLLER SHAFT							
200078: BASE, SUPPORT, UMBILICAL CABLE, VPM, LOADS							
200078: UMBILICAL							
200078: CABLSUP2							

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200078: CABLSUP4							
200078: MODIFICATION TO 200078 SHEET 4							
200078-58: BEARING SPACERS MAIN FRAME-VPM							
200078: PIN, STRICKER, UMBILICAL SUPPORT, VPM, LDUADS							
200078-62: MAIN FRAME-VPM MANIFOLD PLATE							
200078-63: MAIN FRAME-VPM BEARING PINS							
200078: TENSIONS							
200078: UMB-TENS							
200078: APPLES							
200078: CAB-ANC4							
200078: CAB-ANC4							
200078: LDUA/VPM/STRIKER							
200078: MAIN FRAME-VPM MICRO SW. PLATES							
200078-79: MAIN FRAME-VPM FIXED UMB BRACKET							
200078-80: MAIN FRAME-VPM UMBILICAL SUPPORT							
200264-2: INNER TUBE INTERFACE							
200264-3: INNER TUBE-VPM ACCESS & WELD PREP							

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200264-4: INNER TUBE-VPM TUBE WELDMENT							
200264-5: INNER TUBE-VPM ACCESS COVER WELD-T							
200264-6: INNER TUBE-VPM TAPER SLEEVE							
200264-8: INNER TUBE VPM DOUBLER, CAM							
200264-9: APPERLY							
200278-6: ROLL FRAME BEARING SPACER							
200278-7: ROLL FRAME BEARING SEAL							
200280-2: BRACKET DETAILS BASE FRAME							
200280-3: BRACKET WELDM'S BASE FRAME							
200280-4: BASE FRAME							
D.T.00249-1: TURNING FIXTURE ROLLER BRACKET							
D.T.00250-1: TURNING FIXTURE ROLLER BRACKET							
D.T.00307-1: TEST FRAME ASSEMBLY							
D.T.00307-2: VPM TESTING							
D.T.00307-3: VPM TESTING							
D.T.00307-4: CENTER PIVOT BAR TEST FRAME							
D.T.00307-5: BOTTOM PIVOT BAR TEST FRAME							

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
D.T.00307-6: BASE TEST FRAME							
D.T.00307-7: BEARING PLATE TEST FRAME ITEM							
D.T.00307-8: BOTTOM SWIVEL TEST FRAME							
D.T.00307-9: VERTICAL PIVOT TEST FRAME-ITEM 14							
D.T.00307-10: TOP PIVOT TEST FRAME							
D.T.00320-1: GAUGE TAPER SLEEVE							
D.T.00320-2: GRINDING ARBOR TAPER SLEEVE							
2306: VB6-118.A1 MANIFOLD ASSEMBLY							
2345: VB6-119.A1 MANIFOLD ASSEMBLY							
2360: VB6-120.A1 MANIFOLD ASSEMBLY							
2361: VB6-120.A2 MANIFOLD ASSEMBLY							
2371: LDUA SYSTEM HYDRAULIC SCHEMATIC						✓	Outriggers only
2372: SPECIAL 250L RESERVOIR ASSEMBLY							
2373: POWER UNIT GENERAL ASSEMBLY							
2382: LDUA OVERALL SYSTEM HYDRAULIC SCHEMATIC						✓	Outriggers only
2383: VB10-268-A2 MANIFOLD ASSEMBLY							
2387: ELECTRICAL ENCLOSURE FOR X & Y MANIFOLD							

Subsystem 2000							
Drawings	AB	TI	PS	R	PH/C	CM	Comments
2388: ELECTRICAL ENCLOSURE PITCH & ROLL MANIFOLD							
2389: VB20-123.A1 MANIFOLD ASSEMBLY							
2390: VB10-268 A1 MANIFOLD ASSEMBLY							
2503: VB6-118-A2 MANIFOLD ASSEMBLY							
PNL200009-1-3: VERTICAL POSITION MAST LDUA	✓						Components exposed to tank content. material information will be added to H-series drawing
PNL200009-4-7: VERTICAL POSITION MAST LDUA							
200009-8-20: VERTICAL POSITION MAST LDUA							
200019-1: ROLLER ASSEMBLY, INNER TUBE ASSEMBLY, LDUA							
PL200090-1-3: LDUA CONSOLE I/F UNIT ASSEMBLY "PARTS LIST"							
PNL200090-1: LDUA CONSOLE SUBSYSTEM INTERFACE UNIT GENERAL ASSEMBLY							
200101-1: CAMERA, MODIFIED, SHOULDER-LDUA							
PNL200102-1: Window, Camera/Light Shoulder LDUA	✓						Components exposed to tank content. material information will be added to H-series drawing
200114-1-3: KNUCKLE ELBOW LDUA							Components inside purged volume
200115-1: COVER, KNUCKLE ELBOW LDUA							Components inside purged volume
200116-1-3: YOKE ELBOW LDUA							Components inside purged volume

Subsystem 2000							
Drawings	-AB	TI	PS	R	PM/C	CM	Comments
200117-1: COVER. YOKE ELBOW INNER/MIDDLE LDU A							Components inside purged volume
200118-1: LINK. PRIMARY. ELBOW. LDU A							Components inside purged volume
200119-1: LINK. SECONDARY. ELBOW. LDU A							Components inside purged volume
200120-1-2: STRUCTURE. WELDED. ELBOW ASSEMBLY. LDU A							Components inside purged volume
200121-1-2: COVER. HOUSING. ELBOW LDU A							Components inside purged volume
200122-1: SHIM ELBOW LDU A							Components inside purged volume
200123-1: HOUSING. RESOLVER. ELBOW LDU A							Components inside purged volume
200124-1: HOUSING. BEARING ELBOW INNER/MIDDLE LDU A							Components inside purged volume
200125-1: MEMBRANE. SHAFT ELBOW INNER/MIDDLE LDU A							Components inside purged volume
200128-1: MEMBRANE. SHAFT ELBOW INNER/MIDDLE LDU A							
200129-1: CYLINDER. HYDRAULIC. ELBOW ASSEMBLY LDU A							
200130-1: PIN. ELBOW. LDU A							
200131-1: PIN. STRUCTURE. ELBOW. LDU A							
200132-1: PIN. KNUCKLE. ELBOW. LDU A							
200135-1: CYLINDER. HYDRAULIC. SHOULDER. LDU A							
200136-1: SPACER. INFR. SHOULDER ASSEMBLY. LDU A							
200137-1: COVER. UMBILICAL SHOULDER ASSEMBLY LDU A							

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200138-1-2: STRUCTURE, UPPER SHOULDER, LDUA							
200139-1: COVER, PITCH, SHOULDER ASSEMBLY, LDUA							
200140-1-2: COVER, CAMERA/LIGHT, SHOULDER ASSY, LDUA	✓						Components exposed to tank content. material information will be added to H-series drawing
200141-1: FRAME, WINDOW SHOULDER LDUA	✓						Components exposed to tank content. material information will be added to H-series drawing
200144-1: GEAR, GEARMOTOR, YAW DRIVE LDUA							Components inside purged volume
200145-1: HARDSTOP, SHOULDER ASSEMBLY LDUA							Components inside purged volume
200146-1: COUPLING, SPLINED, YAW DRIVE, LDUA							Components inside purged volume
200147-1: GEAR, SERVO, YAW DRIVE, LDUA							Components inside purged volume
200148-1: ADAPTER, GEARBOX, YAW DRIVE, LDUA							Components inside purged volume
200149-1: BRACKET, SUPPORT, CAMERA/LIGHTS, LDUA							Components inside purged volume
200150-1: LINKAGE, TILT, CAMERA/LIGHT, LDUA							Components inside purged volume
200151-1: BRACKET, TILT, CAMERA/LIGHTS, LDUA							Components inside purged volume
PNL200152-1: SUPPORT, COLLAR, CAMERA/LIGHT LDUA							Components inside purged volume
PNL200153-1: SUPPORT, LIGHTS CAMERA/LIGHT LDUA							Components inside purged volume
PNL200154-1: BRACKET, LIGHT LDUA							Components inside purged volume

Subsystem 2000							
Drawings	AB	TI	PS	R	PM/C	CM	Comments
200155-1: HOUSING, BEARING, SHOULDER ASSEMBLY, LDUA	✓						Components exposed to tank content, material information will be added to H-series drawing
PNL200156-1-2: SHAFT, BEARING SHOULDER ASSEMBLY, LDUA	✓						Components exposed to tank content, material information will be added to H-series drawing
PNL200157-2: COVER, UPPER, SHOULDER, DETAILS LDUA							Components inside purged volume
200157-2:							Components inside purged volume
200158-1: PIN, CYLINDER PITCH SHOULDER LDUA							Components inside purged volume
200159-1: PIN, CYLINDER KNUCKLE SHOULDER LDUA							Components inside purged volume
200160-1: KNUCKLE, PITCH, SHOULDER, LDUA							Components inside purged volume
200161-1: TONGUE, KNUCKLE SHOULDER, LDUA							Components inside purged volume
PNL200162-1: COVER, UPPER, SHOULDER, LDUA	✓						Components exposed to tank content, material information will be added to H-series drawing

WHC - LDUA System Drawings

System 1000						
Drawings	AB	TI	PS	R	PM/C	CM
H-6-14055, sheet 1, "LDUA System Block Diagram", Rev. 0	✓	✓				✓
H-6-14057, sheets 1-2, "LDUA Control System Block Diagram", Rev. 0						
Subsystem 2000						
H-6-14140, sheet 1, "LDUA Laser Alignment Fixture", Rev. 0						✓
H-6-14345, sheets 1-4, "Mounting Platform Assembly", Rev. 0						

Subsystem 3000						
Drawings	AB	TI	PS	R	PM/C	CM
H-6-14301, sheets 1-3, "Enclosure TRIC Specification Control Drawing", Rev. 0						
H-6-14302, sheets 1-1, "Plate, Interface TRIC, Enclosure", Rev. 0						

H-6-14303, sheets 1-1. "Angle, Mounting TRIC Enclosure". Rev. 0						
H-6-14304, sheets 1-8. "TRIC Enclosure Assembly". Rev. 0	✓	✓		✓		
Subsystem 3340						
H-6-14341, sheets 1-1. "LDUA Water Decon Trailer Piping Schematic". Rev. 0						✓
H-6-14342, sheets 1-2. "LDUA Water Decon Power and Control Wiring Diagram". Rev. 0			✓			✓
Subsystem 3350						
H-6-14340, sheets 1-12. "Decon Module Assembly". Rev. 0	✓	✓		✓		✓
Subsystem 3660						
H-6-14296, sheet 1. "End-Effector Handling System Weight Assembly". Rev. 0						
H-6-14297, sheets 1-2. "LDUA Riser Isolation Valve Adapter". Rev. 0	✓	✓				
H-6-14298, sheet 1. "LDUA TRIC Storage and Transport Stand". Rev. 0						
H-6-14299, sheet 1. "LDUA TRIC Riggins Fixture". Rev. 0	✓					
H-6-14305, sheets 1-8. "End-Effector Handling System". Rev. 0					✓	✓

H-6-14306, sheets 1-4. "Cart Assembly". Rev. 0					✓	✓
H-6-14307, sheets 1-9. "End-Effector Transport Bar". Rev. 0					✓	✓

Subsystem 4000						
Drawings	AB	TI	PS	R	PM/C	CM
H-6-14100, sheets 1-7. "LDUA Operations Control Trailer Hanford." Rev 0			✓			
H-6-14101, sheet 1. "Wiring Diagram, Air Conditioning Control and Power, Hanford. Rev 1			✓			
H-6-14102, sheet 1. "Electrical Layout, Service Equipment and Grounding, Hanford. Rev 1			✓			
H-6-14103, sheet 1. "Diagram, HVAC Piping, Hanford." Rev 0						✓
H-6-14104, sheet 1. "Motor Control Center, Hanford." Rev 0			✓			
H-6-14105, sheet 1. "Cable, Trailer Power Supply, 480V/3 " Rev 0			✓			
H-6-14106, sheets 1-7. "Operations Control Trailer Instrument Rack equipment Arrangement." Rev 0						

Subsystem 4000						
Drawings	AB	TI	PS	R	PH/C	CH
H-6-14107, sheet 1. "LDUA Operations Control Trailer LAN and Video Cable Layout." Rev 0						✓
H-6-14109, sheet 1. "LDUA System Power Distribution One-line Diagram." Rev 0			✓			
H-6-14110, sheet 1 of 3, "LDUA Power Distribution Rack -Front View." Rev 0			✓			✓
H-6-14110, sheet 2 of 3, "LDUA Power Distribution Rack -Side View." Rev 0			✓			✓
H-6-14110, sheet 3 of 3, "LDUA Power Distribution Rack -Top View." Rev 0			✓			✓
H-6-14111, sheet 1 of 2, "LDUA Power Distribution Rack -One Line Diagram and Details." Rev 1			✓			✓
H-6-14111, sheet 2 of 2, "LDUA Power Distribution Rack -Ground Layout." Rev 0			✓			✓
H-6-14112, sheet 1, "LDUA System Power Distribution Cable Assemblies." Rev 0			✓			✓
H-6-14113, sheet 1, Fiber Optic Umbilical, Rev 0						✓
H-6-14114, sheet 1, "Control Network Interconnection Diagram." Rev 0			✓			✓

Subsystem 4000						
Drawings	AB	TI	PS	R	PM/C	CM
H-6-14115, sheet 1. "I/O Subsystem Interconnection Diagram," Rev 0						✓
H-6-14116, sheet 1. "I/O Subsystem Converter and Terminal Block Assembly," Rev 0						✓
H-6-14117, sheet 1 of 2. "I/O Subsystem Connector Adapter Module Assembly," Rev 0						✓
H-6-14117, sheet 2 of 2. "Connector Adapter Module Connection Diagram, Rev 0						✓
H-6-14118, sheet 1. "Video Display and Recording System Interconnection Diagram," Rev 1						✓
H-6-14119, sheet 1 of 2. "Video System Panels General Arrangement," Rev 0						✓
H-6-14119, sheet 2 of 2. "Video Switcher/4230A1 Wiring Diagram," Rev 0						✓
H-6-14120, sheet 1. "Video Display and Recording System Cable Assembly," Rev 0						✓
H-6-14121, sheet 1. "I/O Subsystem Cable Assembly," Rev 0						✓

Subsystem 4300							
Drawings	AB	TI	PS	R	PM/C	CM	
H-6-14125. sheet 1 of 4. "ATIE Assembly Drawing." Rev 1			✓			✓	
H-6-14125. sheet 2 of 4. "ATIE Assembly Drawing." Rev 1						✓	
H-6-14125. sheet 3 of 4. "ATIE HVAC Details." Rev 0						✓	
H-6-14125. sheet 4 of 4. "ATIE Sunshield Details." Rev 1						✓	
H-6-14126. sheet 1 of 2. "ATIE Elementary Diagram and Panelboard Schedule." Rev 1						✓	
H-6-14126. sheet 2 of 2. "ATIE Power and Control Wiring Diagram." Rev 1						✓	
H-6-14127. sheet 1. "ATIE EE Patch Panel (4300A2A1)." Rev 0							
H-6-14128. sheet 1. "ATIE Opto-22 Drawer #1 (4200A2)." Rev 0							
H-6-14129. sheet 1. "ATIE Interlock Junction Drawer (4300A1A2)." Rev 1							
H-6-14130. sheet 1. "ATIE Equipment Arrangement." Rev 0							
H-6-14131. sheet 1-2. "ATIE Interconnection Diagram." Rev 0						✓	
H-6-14132. sheet 1. "ATIE OPTO-22 Drawer No. 1 wiring Diagram." Rev 0						✓	

Subsystem 4300						
Drawings	AB	TI	PS	R	PM/C	CM
H-6-14133, sheet 1, "ATIE OPTO-22 Drawer No. 2 Wiring Diagram." Rev 0						✓
H-6-14134, sheet 1, "ATIE Interlock Junction Drawer Wiring Diagram." Rev 0					✓	✓
H-6-14135, sheets 1-3, "ATIE Internal Cable Assemblies." Rev 0						✓
H-6-14145, sheet 1-2, "LOUA System Miscellaneous Cable Assemblies." Rev 0						✓
H-6-14217, sheet 1, "Vicoax Transmitter Modifications." Rev 0						
H-6-14218, sheet 1, "Vicon Transmitter PC Board Interface." Rev 0						

Subsystem 5230						
Drawings	AB	TI	PS	R	PM/C	CM
H-6-14099, sheets 1-2, "LOUA Purge Air Supply Assembly." Rev A					✓	✓

Subsystem 6230						
H-6-14242, sheets 1-2, "Close-Up Stereo Video System (CSVS) End Effector Assembly," Rev 0	✓	✓				✓
H-6-14243, sheets 1-3, "Close-Up Stereo Video System (CSVS) End Effector Details," Rev 0						
H-6-14244, sheet 1, "Close-Up Stereo Video System End Effector Camera Housing Weldment," Rev 0						
H-6-14245, sheet 1, "CSVS End Effector Light Baffle Weldment and Misc. Details," Rev 0						
H-6-14246, sheet 1, "Close-Up Stereo Video System Camera Housing Schematic," Rev 0						✓
Subsystem 6260						
H-6-14270, sheet 1 of 8, "Common Video End Effector (CVEE) Support Electronics," Rev 0						✓
H-6-14270, sheet 2 of 8, "CVEE and OAS End To End Drawing," Rev 0						✓
H-6-14270, sheet 3 of 8, "CVEE and HRSYS End To End Drawing," Rev 0						✓
H-6-14270, sheet 4 of 8, "Common Video End Effector (CVEE) Chassis Layout," Rev 0						✓
H-6-14270, sheet 5 of 8, "CVEE Chassis Preparation," Rev 0						✓

H-6-14270, sheet 6 of 8. "C'VEE Chassis Wiring Diagram Part A," Rev 0						✓
H-6-14270, sheet 7 of 8. "C'VEE Wiring Diagram Part B," Rev 0						✓
H-6-14270, sheet 8 of 8. "C'VEE/PC Serial Connections," Rev 0						✓
H-6-14271, sheet 1 of 3. "WHC Power Chassis Layout (C'VEE)," Rev 0					✓	✓
H-6-14271, sheet 2 of 3. "WHC Power Chassis Wiring Diagram (C'VEE)," Rev 0					✓	✓
H-6-14271, sheet 3 of 3. "WHC Power Chassis Schematic (C'VEE)," Rev 0					✓	✓

Subsystem 6510						
Drawings	AB	TI	PS	R	PH/C	CM
H-6-14320. sheets 1-7. "Gripper End Effector Assembly." Rev B						✓
H-6-14321. sheets 1-8. "Camera Housing Assembly." Rev C						✓
H-6-14322. sheets 1-5. "Gripper Assembly." Rev A						✓
H-6-14323. sheet 1. "GEE Electrical Schematic."						✓
H-6-14324. sheet 1. "Cable Assemblies."						✓
H-6-14325. sheet 1. "Pneumatic Block Diagram."						✓
H-6-14326. sheets 1-2. "Pneumatic Mount Layout."						
H-6-14308. sheet 1. "VPM Adapter"	✓	✓				
Subsystem 8100						
H-14-100001. sheets 1-3. "11.000 Gage Plug Assembly." Rev 1	✓	✓				
H-14-100002. sheet 1 of 3. "10.625 Gage Plug Assembly." Rev 2	✓	✓				
H-14-100002. sheet 2 of 3. "10.625 Gage Plug Assembly." Rev 2	✓	✓				

H-14-100002, sheet 3 of 3. "10.625 Gage Plug Assembly." Rev 0	✓	✓				
H-14-100003, sheet 1 of 3. "3.625 Gage Plug Assembly." Rev 1						
H-14-100003, sheet 2 of 3. "3.625 Gage Plug Assembly." Rev 2						
H-14-100003, sheet 3 of 3. "3.625 Gage Plug Assembly." Rev 0						

Subsystem 8200						
Drawings	AB	TI	PS	R	PM/C	CH
H-6-14142, sheets 1-2. "Operations Overview Video Camera System Cable Schematic." Rev 0						✓
H-6-14142, sheet 2. "Operations Overview Video Camera System Layout Wiring." Rev 0						✓
H-6-14200, sheet 1. "UST-ID Overview Systems Control Box Schematics." Rev i						
H-6-14201, sheet 1. "UST-ID OVS Cable Reel Schematic." Rev 0						
H-6-14202, sheet 1. "UST-ID OVS Camera Housing Schematic." Rev i						

Subsystem 8200						
Drawings	AB	TI	PS	R	PH/C	CH
H-6-14203, sheet 1, "UST-ID Video Systems User End Schematic," Rev 1						
H-6-14204, sheet 1, "UST-ID OSVS Camera Housing Schematic," Rev 0						
H-6-14205, sheet 1, "Overview Video System OVS Assembly," Rev 1						
H-6-14205, sheets 2-3, "Overview Video System OVS Details,"						
H-6-14206, sheet 1, "Overview Video System OVS Lamp Housing Weldment,"						
H-6-14207, sheets 1-2, "OVS and OSVS Video Systems Overview Details," Rev 1						
H-6-14207, sheet 3, "OVS and OSVS Video Systems Overview Details," Rev 0						
H-6-14208, sheet 1, "OVS and OSVS Video Systems Overview Housing Weldments," Rev 0						
H-6-14209, sheet 1, "OVS and OSVS Video Systems Deployment Stand Assembly," Rev 1						
H-6-14209, sheet 2-4, "OVS and OSVS Video Systems Deployment Stand Assembly," Rev 0						

Subsystem 8200						
Drawings	AB	TI	PS	R	PM/C	CM
H-6-14210, sheet 1, "OVS and OSVS Video Systems Deployment Stand Frame Subassembly." Rev 0						
H-6-14211, sheet 1, "OVS and OSVS Video Systems Deployment Stand Mounting Details." Rev 1						
H-6-14212, sheet 1, "OVS and OSVS Video Systems Deployment Stand Details -Ribbon Cable Drum." Rev 0						
H-6-14213, sheet 1, "OVS and OSVS Video Systems Deployment Stand Details -Regular Cable Drum." Rev 0						
H-6-14214, sheet 1, "OVS and OSVS Video Systems Deployment Stand Details -Box Subassembly." Rev 1						
H-6-14215, sheet 1, "OVS and OSVS Video Systems Deployment Stand Details -Camera HSG Sleeve." Rev 0						
H-6-14216, sheet 1, "OVS and OSVS Video Systems Deployment Stand Misc. Details." Rev 1						

AB: Necessary to operate within the Authorization Basis
 TI: Depicts information on interfaces with tank
 PS: Necessary to ensure personnel safety
 R: Required to recover LDUA from tank in case of failure
 PM/C: Necessary for PMs and calibrations
 CM: Required for some critical maintenance and troubleshooting essential to mission success

APPENDIX B

EVALUATED DRAWINGS (INCLUDES H-6 AND SPAR/PNNL DRAWINGS)

PURGE AIR SUPPLY ASSY

SPECIFICATION CONTROL DRAWING

LOUA
SOURCE AIR SUPPLY

FORN
ASSEMBLY
F 2006 4/30 H-6-14099 0
1

[illegible]

INTERIOR ELEVATION
CURBSIDE

CONTRACTOR

DATE

BY

REVISION

NO. 1

NO. 2

NO. 3

NO. 4

NO. 5

NO. 6

NO. 7

NO. 8

NO. 9

NO. 10

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NO. 91

NO. 92

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NO. 96

NO. 97

NO. 98

NO. 99

NO. 100

FLOOR PLAN

[illegible]

VIEW: A-A
UNDERCARRIAGE

[illegible]

INTERFACE PANEL

PARTITION

U.S. DEPARTMENT OF ENERGY
NATIONAL LABORATORY

U.S. DEPARTMENT OF ENERGY NATIONAL LABORATORY	
LUNA OPERATIONS	
CONTRACT NO. 11-6-14100	
HNF-2964	
DATE: 11-6-14100	
REVISION: 0	
DRAWN BY: [blank]	
CHECKED BY: [blank]	
APPROVED BY: [blank]	
DATE: 11-6-14100	

NO.	DESCRIPTION	DATE	BY	CHKD	APPD
1	ISSUED FOR CONSTRUCTION	11-6-14100	[blank]	[blank]	[blank]
2	REVISION	11-6-14100	[blank]	[blank]	[blank]
3	REVISION	11-6-14100	[blank]	[blank]	[blank]
4	REVISION	11-6-14100	[blank]	[blank]	[blank]
5	REVISION	11-6-14100	[blank]	[blank]	[blank]
6	REVISION	11-6-14100	[blank]	[blank]	[blank]
7	REVISION	11-6-14100	[blank]	[blank]	[blank]
8	REVISION	11-6-14100	[blank]	[blank]	[blank]
9	REVISION	11-6-14100	[blank]	[blank]	[blank]
10	REVISION	11-6-14100	[blank]	[blank]	[blank]

U.S. DEPARTMENT OF DEFENSE	
MILITARY AERONAUTICAL ENGINEERING	
AIRCRAFT ENGINEERING	
CONTROL TRAILER	
DRAWING NO. HNF-2964	
REV. 0	
DATE 11-1-64	
BY 11-1-64	
CHECKED 11-1-64	
APPROVED 11-1-64	
DESIGNED 11-1-64	
DRAWN 11-1-64	
SCALE 1/4" = 1'-0"	
SHEET 1 OF 1	

U.S. DEPARTMENT OF DEFENSE	
MILITARY AERONAUTICAL ENGINEERING	
AIRCRAFT ENGINEERING	
CONTROL TRAILER	
DRAWING NO. HNF-2964	
REV. 0	
DATE 11-1-64	
BY 11-1-64	
CHECKED 11-1-64	
APPROVED 11-1-64	
DESIGNED 11-1-64	
DRAWN 11-1-64	
SCALE 1/4" = 1'-0"	
SHEET 1 OF 1

QUANTITIES
SHOWN ARE
FOR 2
SYSTEMS

AIR CONDITIONER DRIVE DIAGRAM
(PER SYSTEM)
TRAILER REQUIRES 2 SYSTEMS

ITEM	DESCRIPTION	QUANTITY
1	CONDENSER FAN MOTOR	1
2	CONDENSER FAN MOTOR	1
3	CONDENSER FAN MOTOR	1
4	CONDENSER FAN MOTOR	1
5	CONDENSER FAN MOTOR	1
6	CONDENSER FAN MOTOR	1
7	CONDENSER FAN MOTOR	1
8	CONDENSER FAN MOTOR	1
9	CONDENSER FAN MOTOR	1
10	CONDENSER FAN MOTOR	1
11	CONDENSER FAN MOTOR	1
12	CONDENSER FAN MOTOR	1
13	CONDENSER FAN MOTOR	1
14	CONDENSER FAN MOTOR	1
15	CONDENSER FAN MOTOR	1
16	CONDENSER FAN MOTOR	1
17	CONDENSER FAN MOTOR	1
18	CONDENSER FAN MOTOR	1
19	CONDENSER FAN MOTOR	1
20	CONDENSER FAN MOTOR	1
21	CONDENSER FAN MOTOR	1
22	CONDENSER FAN MOTOR	1
23	CONDENSER FAN MOTOR	1
24	CONDENSER FAN MOTOR	1
25	CONDENSER FAN MOTOR	1

U.S. DEPARTMENT OF AGRICULTURE
NATIONAL BUREAU OF STANDARDS
Hvac Piping
Diagram
1-10-10

ITEM	DESCRIPTION	QUANTITY
1	CONDENSER FAN MOTOR	1
2	CONDENSER FAN MOTOR	1
3	CONDENSER FAN MOTOR	1
4	CONDENSER FAN MOTOR	1
5	CONDENSER FAN MOTOR	1
6	CONDENSER FAN MOTOR	1
7	CONDENSER FAN MOTOR	1
8	CONDENSER FAN MOTOR	1
9	CONDENSER FAN MOTOR	1
10	CONDENSER FAN MOTOR	1
11	CONDENSER FAN MOTOR	1
12	CONDENSER FAN MOTOR	1
13	CONDENSER FAN MOTOR	1
14	CONDENSER FAN MOTOR	1
15	CONDENSER FAN MOTOR	1
16	CONDENSER FAN MOTOR	1
17	CONDENSER FAN MOTOR	1
18	CONDENSER FAN MOTOR	1
19	CONDENSER FAN MOTOR	1
20	CONDENSER FAN MOTOR	1
21	CONDENSER FAN MOTOR	1
22	CONDENSER FAN MOTOR	1
23	CONDENSER FAN MOTOR	1
24	CONDENSER FAN MOTOR	1
25	CONDENSER FAN MOTOR	1

SECTION A-A

UNIT PAID	DESCRIPTION	MANUFACTURER	UNIT
1	SEAT, 120, 200	SEAT	1
2	SEAT, 120, 200	SEAT	2
3	SEAT, 120, 200	SEAT	3
4	SEAT, 120, 200	SEAT	4
5	SEAT, 120, 200	SEAT	5
6	SEAT, 120, 200	SEAT	6
7	SEAT, 120, 200	SEAT	7
8	SEAT, 120, 200	SEAT	8
9	SEAT, 120, 200	SEAT	9
10	SEAT, 120, 200	SEAT	10
11	SEAT, 120, 200	SEAT	11
12	SEAT, 120, 200	SEAT	12
13	SEAT, 120, 200	SEAT	13
14	SEAT, 120, 200	SEAT	14
15	SEAT, 120, 200	SEAT	15
16	SEAT, 120, 200	SEAT	16
17	SEAT, 120, 200	SEAT	17
18	SEAT, 120, 200	SEAT	18
19	SEAT, 120, 200	SEAT	19
20	SEAT, 120, 200	SEAT	20
21	SEAT, 120, 200	SEAT	21
22	SEAT, 120, 200	SEAT	22
23	SEAT, 120, 200	SEAT	23
24	SEAT, 120, 200	SEAT	24
25	SEAT, 120, 200	SEAT	25
26	SEAT, 120, 200	SEAT	26
27	SEAT, 120, 200	SEAT	27
28	SEAT, 120, 200	SEAT	28
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30	SEAT, 120, 200	SEAT	30
31	SEAT, 120, 200	SEAT	31
32	SEAT, 120, 200	SEAT	32
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39	SEAT, 120, 200	SEAT	39
40	SEAT, 120, 200	SEAT	40
41	SEAT, 120, 200	SEAT	41
42	SEAT, 120, 200	SEAT	42
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58	SEAT, 120, 200	SEAT	58
59	SEAT, 120, 200	SEAT	59
60	SEAT, 120, 200	SEAT	60
61	SEAT, 120, 200	SEAT	61
62	SEAT, 120, 200	SEAT	62
63	SEAT, 120, 200	SEAT	63
64	SEAT, 120, 200	SEAT	64
65	SEAT, 120, 200	SEAT	65
66	SEAT, 120, 200	SEAT	66
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68	SEAT, 120, 200	SEAT	68
69	SEAT, 120, 200	SEAT	69
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71	SEAT, 120, 200	SEAT	71
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94	SEAT, 120, 200	SEAT	94
95	SEAT, 120, 200	SEAT	95
96	SEAT, 120, 200	SEAT	96
97	SEAT, 120, 200	SEAT	97
98	SEAT, 120, 200	SEAT	98
99	SEAT, 120, 200	SEAT	99
100	SEAT, 120, 200	SEAT	100

[illegible][illegible]

WIRING	
PIN 1	BLK
PIN 2	GRN
PIN 3	RED
N	WHITE (GND TAP)
CHO	GRN

[illegible][illegible]

ETHERNET CABLES IN USE & SPARE

COAXIAL CABLES IN USE

COAXIAL CABLES IN USE

OPERATIONS CONTROL TRAILER LAN AND VIDEO CABLE LAYOUT

LEGEND

Legend for the diagram, showing symbols for various cable types and equipment.

NO.	DESCRIPTION	QUANTITY	REMARKS
1	ETHERNET CABLE	100	
2	COAXIAL CABLE	100	
3	VIDEO CABLE	100	
4	LAN CABLE	100	
5	VIDEO CABLE	100	
6	LAN CABLE	100	
7	ETHERNET CABLE	100	
8	COAXIAL CABLE	100	
9	VIDEO CABLE	100	
10	LAN CABLE	100	
11	VIDEO CABLE	100	
12	LAN CABLE	100	
13	ETHERNET CABLE	100	
14	COAXIAL CABLE	100	
15	VIDEO CABLE	100	
16	LAN CABLE	100	
17	VIDEO CABLE	100	
18	LAN CABLE	100	
19	ETHERNET CABLE	100	
20	COAXIAL CABLE	100	
21	VIDEO CABLE	100	
22	LAN CABLE	100	
23	VIDEO CABLE	100	
24	LAN CABLE	100	
25	ETHERNET CABLE	100	
26	COAXIAL CABLE	100	
27	VIDEO CABLE	100	
28	LAN CABLE	100	
29	VIDEO CABLE	100	
30	LAN CABLE	100	
31	ETHERNET CABLE	100	
32	COAXIAL CABLE	100	
33	VIDEO CABLE	100	
34	LAN CABLE	100	
35	VIDEO CABLE	100	
36	LAN CABLE	100	
37	ETHERNET CABLE	100	
38	COAXIAL CABLE	100	
39	VIDEO CABLE	100	
40	LAN CABLE	100	
41	VIDEO CABLE	100	
42	LAN CABLE	100	
43	ETHERNET CABLE	100	
44	COAXIAL CABLE	100	
45	VIDEO CABLE	100	
46	LAN CABLE	100	
47	VIDEO CABLE	100	
48	LAN CABLE	100	
49	ETHERNET CABLE	100	
50	COAXIAL CABLE	100	
51	VIDEO CABLE	100	
52	LAN CABLE	100	
53	VIDEO CABLE	100	
54	LAN CABLE	100	
55	ETHERNET CABLE	100	
56	COAXIAL CABLE	100	
57	VIDEO CABLE	100	
58	LAN CABLE	100	
59	VIDEO CABLE	100	
60	LAN CABLE	100	
61	ETHERNET CABLE	100	
62	COAXIAL CABLE	100	
63	VIDEO CABLE	100	
64	LAN CABLE	100	
65	VIDEO CABLE	100	
66	LAN CABLE	100	
67	ETHERNET CABLE	100	
68	COAXIAL CABLE	100	
69	VIDEO CABLE	100	
70	LAN CABLE	100	
71	VIDEO CABLE	100	
72	LAN CABLE	100	
73	ETHERNET CABLE	100	
74	COAXIAL CABLE	100	
75	VIDEO CABLE	100	
76	LAN CABLE	100	
77	VIDEO CABLE	100	
78	LAN CABLE	100	
79	ETHERNET CABLE	100	
80	COAXIAL CABLE	100	
81	VIDEO CABLE	100	
82	LAN CABLE	100	
83	VIDEO CABLE	100	
84	LAN CABLE	100	
85	ETHERNET CABLE	100	
86	COAXIAL CABLE	100	
87	VIDEO CABLE	100	
88	LAN CABLE	100	
89	VIDEO CABLE	100	
90	LAN CABLE	100	
91	ETHERNET CABLE	100	
92	COAXIAL CABLE	100	
93	VIDEO CABLE	100	
94	LAN CABLE	100	
95	VIDEO CABLE	100	
96	LAN CABLE	100	
97	ETHERNET CABLE	100	
98	COAXIAL CABLE	100	
99	VIDEO CABLE	100	
100	LAN CABLE	100	

NO.	DESCRIPTION	DATE	BY	CHKD.
1	REVISION			
2	REVISION			
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8	REVISION			
9	REVISION			
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99	REVISION			
100	REVISION			

U.S. DEPARTMENT OF ENERGY
 POWER DISTRIBUTION
 ONE-LINE DIAGRAM
 HNF-2964-14109

- GENERAL NOTES:
1. POWER CABLES ARE SHOWN AS TENDING OR 50 FEET GUY.
 2. ALL CONDUCTORS FOR OVERHEAD LINES SHALL BE 1/2" DIA. OR LARGER.
 3. FOR OVERHEAD LINES, SPACER POWER SPACER CABLES.
 4. CONDUCTORS FOR PHASES A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, JF, JG, JH, JI, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MI, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NI, NJ, NK, NL, NM, NN, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OI, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QI, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RI, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UV, UW, UX, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WI, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WU, WV, WW, WX, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XI, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YI, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ.

 	

[illegible]

 

NOTES:

1. ALL CIRCUIT BREAKERS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
 - a. FIELD MOUNTED AND SUPPORT AS REQUIRED.
 - b. 1500 VOLT, 1000 AMP, 1000 CYCLES PER SECOND.
 - c. 1500 VOLT, 1000 AMP, 1000 CYCLES PER SECOND.
2. ALL CIRCUIT BREAKERS SHALL BE RATED 1500 VOLT.
3. ALL CIRCUIT BREAKERS SHALL BE RATED 1000 AMP.

LAWA	
NO. 101	NO. 101
NO. 102	NO. 102
NO. 103	NO. 103
NO. 104	NO. 104
NO. 105	NO. 105
NO. 106	NO. 106
NO. 107	NO. 107
NO. 108	NO. 108
NO. 109	NO. 109
NO. 110	NO. 110
NO. 111	NO. 111
NO. 112	NO. 112
NO. 113	NO. 113
NO. 114	NO. 114
NO. 115	NO. 115
NO. 116	NO. 116
NO. 117	NO. 117
NO. 118	NO. 118
NO. 119	NO. 119
NO. 120	NO. 120

POWER DISTRIBUTION RACK

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POWER DISTRIBUTION RACK

U.S. GOVERNMENT PRINTING OFFICE: 1965 O - 345-111-7		CONTRACTOR ADAPTER MODULE		ASSEMBLY	
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
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145	146	147	148	149	150
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157	158	159	160	161	162
163	164	165	166	167	168
169	170	171	172	173	174
175	176	177	178	179	180
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229	230	231	232	233	234
235	236	237	238	239	240
241	242	243	244	245	246
247	248	249	250	251	252
253	254	255	256	257	258
259	260	261	262	263	264
265	266	267	268	269	270
271	272	273	274	275	276
277	278	279	280	281	282
283	284	285	286	287	288
289	290	291	292	293	294
295	296	297	298	299	300
301	302	303	304	305	306
307	308	309	310	311	312
313	314	315	316	317	318
319	320	321	322	323	324
325	326	327	328	329	330
331	332	333	334	335	336
337	338	339	340	341	342
343	344	345	346	347	348
349	350	351	352	353	354
355	356	357	358	359	360
361	362	363	364	365	366
367	368	369	370	371	372
373	374	375	376	377	378
379	380	381	382	383	384
385	386	387	388	389	390
391	392	393	394	395	396
397	398	399	400	401	402
403	404	405	406

THE VIDEO SWITCHER SENDS SPITTER PAPER, ACCEPTS ALL VIDEO INPUTS TO THE SWITCHER. THE SPATTER SWITCHES EACH INPUT TO TWO COAXIAL CABLES WHICH ARE CONNECTED TO THE APPROPRIATE PORTS ON THE SPATTER BACK PLANE. FOR CHANNEL 13, THE CHANNEL 13 "A" INPUT IS CONNECTED TO THE CHANNELS 13 "A" INPUT JACKS ON THE SPATTER PANEL. THE TWO COAXIAL CABLES COME FROM THE SPATTER PANEL, CHANNEL 13 "A" INPUT AND CONNECTED TO THE 2 SMOOTHER INPUTS FOR THE CHANNEL 13 "A" INPUT.

VIDEO SWITCHER 4230A1

GENERAL NOTES: (SEE DRAWING SHEETS)

- △ CABLES SHALL BE SECURED AT A SPACE OF 500' ALONG WITH A MINIMUM OF 10' FROM THE END OF THE CABLE. (SEE DRAWING SHEETS FOR CABLE END DETAIL)
- △ CABLES SHALL BE SECURED AT A SPACE OF 500' ALONG WITH A MINIMUM OF 10' FROM THE END OF THE CABLE. (SEE DRAWING SHEETS FOR CABLE END DETAIL)
- △ CABLES SHALL BE SECURED AT A SPACE OF 500' ALONG WITH A MINIMUM OF 10' FROM THE END OF THE CABLE. (SEE DRAWING SHEETS FOR CABLE END DETAIL)
- △ CABLES SHALL BE SECURED AT A SPACE OF 500' ALONG WITH A MINIMUM OF 10' FROM THE END OF THE CABLE. (SEE DRAWING SHEETS FOR CABLE END DETAIL)

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
RECORDING SYSTEM
CABLE ASSEMBLY
NBS-6-14120

NO.	DESCRIPTION	QTY.	UNIT
1	CABLE ASSEMBLY "A"	1	EA
2	CABLE ASSEMBLY "B"	1	EA
3	CABLE ASSEMBLY "C"	1	EA
4	CABLE ASSEMBLY "D"	1	EA
5	CABLE ASSEMBLY "E"	1	EA

NO.	DESCRIPTION	QTY.	UNIT
1	CABLE ASSEMBLY "A"	1	EA
2	CABLE ASSEMBLY "B"	1	EA
3	CABLE ASSEMBLY "C"	1	EA
4	CABLE ASSEMBLY "D"	1	EA
5	CABLE ASSEMBLY "E"	1	EA
6	CABLE ASSEMBLY "F"	1	EA
7	CABLE ASSEMBLY "G"	1	EA
8	CABLE ASSEMBLY "H"	1	EA
9	CABLE ASSEMBLY "I"	1	EA
10	CABLE ASSEMBLY "J"	1	EA
11	CABLE ASSEMBLY "K"	1	EA
12	CABLE ASSEMBLY "L"	1	EA
13	CABLE ASSEMBLY "M"	1	EA
14	CABLE ASSEMBLY "N"	1	EA
15	CABLE ASSEMBLY "O"	1	EA
16	CABLE ASSEMBLY "P"	1	EA
17	CABLE ASSEMBLY "Q"	1	EA
18	CABLE ASSEMBLY "R"	1	EA
19	CABLE ASSEMBLY "S"	1	EA
20	CABLE ASSEMBLY "T"	1	EA
21	CABLE ASSEMBLY "U"	1	EA
22	CABLE ASSEMBLY "V"	1	EA
23	CABLE ASSEMBLY "W"	1	EA
24	CABLE ASSEMBLY "X"	1	EA
25	CABLE ASSEMBLY "Y"	1	EA
26	CABLE ASSEMBLY "Z"	1	EA

NOTES:

1. ALL DIMENSIONS ARE IN INCHES AND DECIMALS THEREOF. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS.

2. SEE DRAWING HNF-2964-1 FOR DETAILS OF THE ENCLOSURE.

3. SEE DRAWING HNF-2964-2 FOR DETAILS OF THE ENCLOSURE.

4. SEE DRAWING HNF-2964-3 FOR DETAILS OF THE ENCLOSURE.

5. SEE DRAWING HNF-2964-4 FOR DETAILS OF THE ENCLOSURE.

6. SEE DRAWING HNF-2964-5 FOR DETAILS OF THE ENCLOSURE.

7. SEE DRAWING HNF-2964-6 FOR DETAILS OF THE ENCLOSURE.

8. SEE DRAWING HNF-2964-7 FOR DETAILS OF THE ENCLOSURE.

9. SEE DRAWING HNF-2964-8 FOR DETAILS OF THE ENCLOSURE.

10. SEE DRAWING HNF-2964-9 FOR DETAILS OF THE ENCLOSURE.

11. SEE DRAWING HNF-2964-10 FOR DETAILS OF THE ENCLOSURE.

12. SEE DRAWING HNF-2964-11 FOR DETAILS OF THE ENCLOSURE.

DATA	
DATE	11-11-66
BY	J. J. JONES
CHKD	J. J. JONES
DATE	11-11-66
ASSEMBLY DRAWING	
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REVISIONS		DATE		BY		CHECKED		APPROVED	
1	AS BUILT	12/15/94	12/15/94	12/15/94	12/15/94	12/15/94	12/15/94	12/15/94	12/15/94
<div style="display: flex; justify-content: space-between;"> <div> <p>PROJECT: HNF-2964</p> <p>DATE: 12/15/94</p> <p>BY: [Signature]</p> <p>CHECKED: [Signature]</p> <p>APPROVED: [Signature]</p> </div> <div> <p>REVISIONS</p> <p>DATE</p> <p>BY</p> <p>CHECKED</p> <p>APPROVED</p> </div> </div>

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ATE RS-485 INTERCONNECTION DIAGRAM

FOR GENERAL NOTES SEE SHEET 1

U.S. GOVERNMENT PRINTING OFFICE	
1964 O-348-748	
A1-JANUARY 1964	
INTERCONNECTION DIAGRAM	
HNF-2964	
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GENERAL NOTES

1. ALL WIRING IS TO BE ACCORDING TO THE 1975 EDITION OF THE NATIONAL ELECTRICAL CODE.
2. THE WIRING SHALL BE IN ACCORDANCE WITH THE 1975 EDITION OF THE NATIONAL ELECTRICAL CODE.
3. THE WIRING SHALL BE IN ACCORDANCE WITH THE 1975 EDITION OF THE NATIONAL ELECTRICAL CODE.
4. THE WIRING SHALL BE IN ACCORDANCE WITH THE 1975 EDITION OF THE NATIONAL ELECTRICAL CODE.
5. THE WIRING SHALL BE IN ACCORDANCE WITH THE 1975 EDITION OF THE NATIONAL ELECTRICAL CODE.
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8. THE WIRING SHALL BE IN ACCORDANCE WITH THE 1975 EDITION OF THE NATIONAL ELECTRICAL CODE.
9. THE WIRING SHALL BE IN ACCORDANCE WITH THE 1975 EDITION OF THE NATIONAL ELECTRICAL CODE.
10. THE WIRING SHALL BE IN ACCORDANCE WITH THE 1975 EDITION OF THE NATIONAL ELECTRICAL CODE.

HNF-2964, Revision 0

GENERAL NOTES:

ALL MATTERS TO BE DISCUSS'D THURSDAY PM. 8:30 OR 10:30 AM.

POS	UNIT	1-2	3-4
1	N/A	C	C
2	NOVAC	K	0
3	NOVAC	C	K

THE UNIVERSITY OF CHICAGO PRESS

INTERLOCK JUNCTION PANEL WIRING DIAGRAM
ASSEMBLY 4300A1A2

[illegible]

[illegible][illegible]

BIBLIOTHECA MUSEI HIST. NAT. BRAS. 2.

[illegible][illegible]

PARTS/MATERIAL LIST

[illegible]

11 CABLE ASSEMBLY "K"
CABLE ASSEMBLY

FOR GENERAL NOTES, PARTS LIST AND
REFERENCE DRAWINGS, SEE SHEET 1

12

U.S. DEPARTMENT OF ENERGY Nuclear Energy Research Laboratory	AT-TANK INSTR ENCLOSURE (ATIE) INTERNAL CABLE ASSY'S	H-6-14135
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OCT / OOV5
INTERFACE PANEL

① CABLE ASSEMBLY

② CABLE ASSEMBLY

③ CABLE ASSEMBLY POWER

Diagram illustrating the pin connections for the 8200A2 receiver and 8200A5P1 transmitter. The diagram shows two 26-pin connectors. The left connector is labeled "RECEIVER 8200A2" and the right connector is labeled "PAN and TIL 8200A5P1". The connections are as follows:

Receiver Pin	Transmitter Pin	Signal
2	1	DATA
6	2	DATA
7	3	DATA
14	4	DATA
15	5	DATA
20	6	DATA
21	7	DATA
25	8	DATA

④ CABLE ASSEMBLY

⑤ CABLE ASSEMBLY

[illegible]

NOTES

1. CABLE ASSEMBLY 6 IS MADE FROM COAX RG-58/U, ITEM 10.
2. CABLE ASSEMBLY 7 IS MADE FROM COAX RG-58/U, PLENUM RATED
VIEW 8.
3. THE CABLE IS SUPPLIED BY THE LEAD VENDOR.

3. THIS CAMP IS SUPPLIED BY THE LEAD VENDOR

U.S. DEPARTMENT OF ENERGY
Atomic Energy Commission
STATION SW-101, MC-157, BS
OPERATIONS OVERVIEW
VIDEO CAMERA SYSTEM
AS CABLE SCHEMATIC

W-5-14142

707518

1

3. A.01.52.01

.....

WIRING DIAGRAM:

[illegible]

6 CABLE 2000A6W1 ASSEMBLY
(10 Pairs of Cables)
(10 Pairs of Connectors)
(10 Pairs of Cables)
(10 Pairs of Connectors)

5 CABLE 2000A6W2 ASSEMBLY
(10 Pairs of Cables)
(10 Pairs of Connectors)
(10 Pairs of Cables)
(10 Pairs of Connectors)

6 CABLE 2000A6W2 ASSEMBLY
(10 Pairs of Cables)
(10 Pairs of Connectors)
(10 Pairs of Cables)
(10 Pairs of Connectors)

7 CABLE 2000A6W3 ASSEMBLY
(10 Pairs of Cables)
(10 Pairs of Connectors)
(10 Pairs of Cables)
(10 Pairs of Connectors)

U.S. GOVERNMENT PRINTING OFFICE	
LEJLA SYSTEM	
WIRE CABLE ASSEMBLY	
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NO.	DESCRIPTION	QTY	UNIT	REMARKS
1	CABLE 2000A6W1 ASSEMBLY	1	EA	
2	CABLE 2000A6W2 ASSEMBLY	1	EA	
3	CABLE 2000A6W3 ASSEMBLY	1	EA	
4	CABLE 2000A6W4 ASSEMBLY	1	EA	
5	CABLE 2000A6W5 ASSEMBLY	1	EA	
6	CABLE 2000A6W6 ASSEMBLY	1	EA	
7	CABLE 2000A6W7 ASSEMBLY	1	EA	
8	CABLE 2000A6W8 ASSEMBLY	1	EA	
9	CABLE 2000A6W9 ASSEMBLY	1	EA	
10	CABLE 2000A6W10 ASSEMBLY	1	EA

RECEIVED FROM
Vestlinghus Savannah River Site

U.S. DEPARTMENT OF JUSTICE Federal Bureau of Investigation Washington, D.C. 20535	U.S. DEPARTMENT OF JUSTICE Federal Bureau of Investigation Washington, D.C. 20535
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[illegible][illegible][illegible]

NOTES:
1. DRAWING IS APPROXIMATE TO SCALE
2. THE CHASSIS IS TO BE MOUNTED ON A 19" RACK
3. THE CHASSIS IS TO BE MOUNTED ON A 19" RACK

U.S. GOVERNMENT PRINTING OFFICE: 1964 O - 342-111	
COMMON VIDEO END EFFECTOR (CCEE) CHASSIS LAYOUT	
1	24 VDC POWER SUPPLY
2	B1 BRAIN BOARD
3	B2 BRAIN BOARD
4	COMMON VIDEO END EFFECTOR
5	COMMON VIDEO END EFFECTOR
6	COMMON VIDEO END EFFECTOR
7	COMMON VIDEO END EFFECTOR
8	COMMON VIDEO END EFFECTOR
9	COMMON VIDEO END EFFECTOR
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66	COMMON VIDEO END EFFECTOR
67	COMMON VIDEO END EFFECTOR
68	COMMON VIDEO END EFFECTOR
69	COMMON VIDEO END EFFECTOR
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97	COMMON VIDEO END EFFECTOR
98	COMMON VIDEO END EFFECTOR
99	COMMON VIDEO END EFFECTOR
100	COMMON VIDEO END EFFECTOR

DATE	BY	CHKD	APP'D	REVISION	DESCRIPTION
11-6-14270					

FORM NO. 10-100-100		Rev. 10-100-100	
U.S. DEPARTMENT OF ENERGY		Nuclear Energy Research Institute	
OVC/PC SERIAL CONNECTIONS			
DATE	BY	CHKD	APP'D
11-6-14270			
FORM NO. 10-100-100

WHC POWER CHASSIS
WIRING DIAGRAM

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1	10-1-71	W	W	W	INITIAL RELEASE
2	10-1-71	W	W	W	REVISION
3	10-1-71	W	W	W	REVISION
4	10-1-71	W	W	W	REVISION
5	10-1-71	W	W	W	REVISION
6	10-1-71	W	W	W	REVISION
7	10-1-71	W	W	W	REVISION
8	10-1-71	W	W	W	REVISION
9	10-1-71	W	W	W	REVISION
10	10-1-71	W	W	W	REVISION

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	REMARKS
1	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
2	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
3	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
4	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
5	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
6	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
7	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
8	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
9	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
10	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
11	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
12	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
13	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
14	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
15	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
16	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
17	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
18	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
19	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
20	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
21	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
22	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
23	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
24	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
25	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
26	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
27	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
28	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
29	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
30	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1

NOTES:

1. DIMENSIONS ARE IN INCHES. TOLERANCES:
FRACTIONS DECIMALS
1/16 1/32 1/64
F. FINISH ALL SURFACES AND SHARP EDGES.

A BOLT HEAD CLEARANCE CUTOUT

SECTION A-A

1 BRASS ISOLATION VALVE ADAPTER

2 GASKET

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	REMARKS
1	BRASS ISOLATION VALVE ADAPTER	1	EA	SEE NOTE 1
2	GASKET	1	EA	SEE NOTE 1

1
DETAIL
SCALE: 1/2

SECTION

NOTES

1. REMOVE ALL NAILS AND SHARP EDGES.
2. ALL CORNERS MUST BE ROUNDED IN ACCORDANCE WITH 4-W-5-0013.
3. ALL STAINLESS STEEL WELDING TO BE PERFORMED IN ACCORDANCE WITH AWS D1.1.
4. ALL CARBON STEEL WELDING TO BE PERFORMED AND INSPECTED IN ACCORDANCE WITH AWS D1.1.
5. MAGNETIC PARTICLE TEST FOR AWS D1.1 PRIOR TO AND FOLLOWING LOAD TEST.
6. PAINT 1" LOAD CAPACITY 2000 LBS. IN 2" HIGH BLACK LETTERS ON A YELLOW BACKGROUND.
7. USUALLY TEST FIT UP, HOOT PADS AND TACK PADS ON ALL WELDS.
8. LOAD TEST AT 125% OF RATED LOAD CAPACITY (5000 LBS.) FOR DCR-BL-12-34.
9. 1" THICK AND PAIN CHARACTERS WITH TWO COATS OF 100% ZINC-PRIMER.
10. 1" THICK AND PAIN CHARACTERS WITH TWO COATS OF 100% ZINC-PRIMER.

PLAN

SECTION
PAGE 1/2

[illegible]

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M (82). DIMENSIONS ARE IN INCHES. TOLERANCE ON DECIMALS: $X = \pm .1$, $.XX = \pm .02$, $.XXX = \pm .005$. ANGLES $\pm 1^\circ$. FRACTIONS IN PARENTHESES ARE GENERAL DIMENSIONS.

17. *Alum. Jantusocci* in variegated ...

4. ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH THE ASME STANDARD SECTION V-5-0013

"WELDING OF STAINLESS STEEL AND NICKEL ALLOY AND OTHER COMPONENTS"

STRUCTURAL AND OTHER COMMENTS
REVISION "A", 10/19/92.

LOTTING IN: SPOONS AT ASSEMBLY. EXCEPT WHERE LOCK NUTS ARE USED.

3. THE EFFECTS OF THE CHANGE AND THE REASON

6. MOUNTING FLANGE TO BE USED WHEN THIS ENCLOSURE MOUNTED TO THE

SEE SHEET 1 FOR NOTES

DEPARTMENT OF THE ARMY

SOLE, MANAGED, COMPAN

ENCLOSURE

ASSEMBLY

H-6-1430

1000

3

B-73

DEC 17 1964
- 55

SEE SHEET 1 FOR NOTES

DEPARTMENT OF ENERGY
STRENGTHENED BLANKET COMPANY
TRIC ENCLOSURE
ASSEMBLY

VIEW C-C
(ROOM NOT SHOWN SEE SHEET 2)

SEE SHEET 1 FOR NOTES

U.S. DEPARTMENT OF ENERGY
NATIONAL LABORATORY
TRIC ENCLOSURE
ASSEMBLY

NO.	REV.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1						ASSEMBLY
2						ENCLOSURE
3						TRIC
4						ENCLOSURE
5						TRIC
6						ENCLOSURE
7						TRIC
8						ENCLOSURE
9						TRIC
10						ENCLOSURE
11						TRIC
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13						TRIC
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17						TRIC
18						ENCLOSURE
19						TRIC
20						ENCLOSURE
21						TRIC
22						ENCLOSURE
23						TRIC
24						ENCLOSURE
25						TRIC

3 INCH SCALE

SEE SHEET 1 FOR NOTES

U.S. DEPARTMENT OF ENERGY	
TRIC ENCLOSURE ASSEMBLY	
1	10000
2	10000
3	10000
4	10000
5	10000
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100	10000

PLAIN FLANGE CONNECTIONS
SCALE 1/1

GENERAL NOTES :

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M (M2). DIMENSIONS ARE IN INCHES, TOLERANCES ON DECIMALS : $X = \pm .1$, $XX = \pm .05$, $XXX = \pm .005$, ANGLES $\pm .1^\circ$. UNLESS OTHERWISE SPECIFIED, SURFACES ARE TO BE MACHINED.

----- ALL OTHERS TO BE REMOVED ALL BUDGETS.

3. MACHINED SURFACE TO BE ☒ V
4. ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH
AWS D1.1, SECTION 4.1.2 FOR WELDING OF ALUMINUM.

• LOCATE ALL SCREWS AT ASSEMBLY.

CASE THREADS TO MATCHES
3/16-28 UNC-2A
MODIFY AS SHOWN

43 EYEBOLT
SCALE 1/4"

43 BRACE SWIVEL
SCALE 1/4"

43 NUT
SCALE 1/4"

SEE PART 1 FOR DETAILS

SEE PART 1 FOR DETAILS

SEE PART 1 FOR DETAILS

SEE PART 1 FOR DETAILS

SEE PART 1 FOR DETAILS

SEE PART 1 FOR DETAILS

SEE PART 1 FOR DETAILS

SEE PART 1 FOR DETAILS

SEE PART 1 FOR DETAILS

21 RAIL
SCALE 1/1

[illegible]

GENERAL NOTES:

1. DIMENSIONS AND TOLERANCES ARE IN INCHES. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS. DIMENSIONS IN BRACKETS ARE IN METERS. DIMENSIONS IN PARENTHESES ARE IN METERS.
2. BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
3. WELDING SURFACE TO BE 1/16".
4. ALL WELDING JOINTS SHALL BE WELDED TO THE WELDING SPECIFICATION.
5. LOCATE ALL SCREWS AT APPROXIMATE.

PARTS LIST/ANTENNA L&S		ASSEMBLY	
ITEM NO.	DESCRIPTION	QTY	UNIT
1	FRAME, CART	1	EA
2	WHEEL, 10" DIA	2	EA
3	WHEEL, 10" DIA	2	EA
4	WHEEL, 10" DIA	2	EA
5	WHEEL, 10" DIA	2	EA
6	WHEEL, 10" DIA	2	EA
7	WHEEL, 10" DIA	2	EA
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98	WHEEL, 10" DIA	2	EA
99	WHEEL, 10" DIA	2	EA
100	WHEEL, 10" DIA	2	EA

U.S. GOVERNMENT PRINTING OFFICE
1964 O-513543

CART ASSEMBLY

100% INSPECTION REQUIRED

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U.S. DEPARTMENT OF ENERGY
FEDERAL BUREAU OF INVESTIGATION
END EFFECTOR
END EFFORT BAR
8

2 FOOT SCALE: 1"=2'

U.S. DEPARTMENT OF ENERGY
FEDERAL BUREAU OF INVESTIGATION
END EFFECTOR
END EFFORT BAR
8

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

② LEAD SCREW
SCALE 1/1

③ BLOCK, BEARING
SCALE 1/1

④ NUT, LEAD SCREW
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑤ CLAMP, SPROCKET
SCALE 1/1

⑥ CLAMP, SPROCKET/SHAFT
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑦ CLAMP, SPROCKET/SHAFT
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑧ CLAMP, SPROCKET/SHAFT
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑨ CLAMP, SPROCKET/SHAFT
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑩ CLAMP, SPROCKET/SHAFT
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑪ CLAMP, SPROCKET/SHAFT
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑫ CLAMP, SPROCKET/SHAFT
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑬ CLAMP, SPROCKET/SHAFT
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑭ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑮ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑯ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑰ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑱ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑲ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑳ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉑ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉒ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉓ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉔ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉕ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉖ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉗ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉘ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉙ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉚ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉛ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉜ SPROCKET
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

⑳ HANDLE CRANK
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉑ HANDLE CRANK
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉒ HANDLE CRANK
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉓ HANDLE CRANK
SCALE 1/1

U.S. FROM: 10115A-71011
TECHNO: 10115A-71011

㉔ HANDLE CRANK
SCALE 1/1

GENERAL NOTES

- [illegible]

[illegible][illegible]

5. LOCATE (REMOVABLE) ALL SCREWS AT ASSEMBLY.

SEE SHEET 1 FOR NOTES

U.S. DEPARTMENT OF ENERGY
Office of Energy Conservation
CRIPPER
END EFFECTOR
ASSEMBLY

30 PLATE, MOUNTING, CAMERA
SCALE 2/1

35 PLATE, MOUNTING, CAMERA
SCENE 2/1

31 PLATE, HINGE, CAMERA
SCALE 2/1

36 PLATE, HINGE, CAMERA
SCALE 2/1

SEE PAGE 1 FOR NOTES

UNIVERSITY OF CALIFORNIA

CAMERA HOUSING ASSEMBLY

4750	H-6-1432
------	----------

1

[illegible][illegible]

DIMENSIONING AND TOLERANCING PER ANSI Y14.5M (82). DIMENSIONS ARE IN INCHES, TOLERANCES ON DECIMALS: .X = $\pm .1$, .XX = $\pm .03$, .XXX = $\pm .005$, ANGLES $\pm 1^\circ$. DIMENSIONS IN FRACTIONS ARE GENERAL DIMENSIONS.

2. BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
3. MACHINED SURFACE TO BE $12\sqrt{}$
4. ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH S&W WELDING PROCEDURE 1-594-B.
5. LOCITE ALL SCREWS AS ASSEMBLY.
6. COMPACT AIR CYLINDER NO. 84 X 112196 HTV WITH 11,000 PSI CHOICE AIR (NOT BOILER QUALITY) WITH 11,000 PSI CHOICE AIR (NOT BOILER QUALITY)

1 ASSEMBLY
SCALE: 1/1

U.S. DEPARTMENT OF ENERGY	
HNF-2964	
GRIPPER ASSEMBLY	
REV	DATE
1	11-6-1322
2	11-6-1322
3	11-6-1322
4	11-6-1322
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22	11-6-1322
23	11-6-1322
24	11-6-1322

Cable designation	Cable type
W1	STANDARD 120VAC PIGTAIL
W2	BELDON #19348
W3	BELDON #19166
W4	BELDON #19165

COPIES OF THESE PLANS ARE TO BE SUBMITTED TO THE DISTRICT ATTORNEY AT 2200 OF CABLE WAY.

NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	NO. 7	NO. 8	NO. 9	NO. 10	NO. 11	NO. 12	NO. 13	NO. 14	NO. 15	NO. 16	NO. 17	NO. 18	NO. 19	NO. 20	NO. 21	NO. 22	NO. 23	NO. 24	NO. 25	NO. 26	NO. 27	NO. 28	NO. 29	NO. 30	NO. 31	NO. 32	NO. 33	NO. 34	NO. 35	NO. 36	NO. 37	NO. 38	NO. 39	NO. 40	NO. 41	NO. 42	NO. 43	NO. 44	NO. 45	NO. 46	NO. 47	NO. 48	NO. 49	NO. 50	NO. 51	NO. 52	NO. 53	NO. 54	NO. 55	NO. 56	NO. 57	NO. 58	NO. 59	NO. 60	NO. 61	NO. 62	NO. 63	NO. 64	NO. 65	NO. 66	NO. 67	NO. 68	NO. 69	NO. 70	NO. 71	NO. 72	NO. 73	NO. 74	NO. 75	NO. 76	NO. 77	NO. 78	NO. 79	NO. 80	NO. 81	NO. 82	NO. 83	NO. 84	NO. 85	NO. 86	NO. 87	NO. 88	NO. 89	NO. 90	NO. 91	NO. 92	NO. 93	NO. 94	NO. 95	NO. 96	NO. 97	NO. 98	NO. 99	NO. 100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

PNEUMATIC BLOCK DIAGRAM

1. 3/4\"/>
2. WORK VALVE WAYS ARE 3 POSITION.
3. ELECTRIC LOCKS WAYS ARE IN GET FOR WORKS.
4. 3/4\"/>
5. EXTERNAL PISTONS ARE USED ON ELECTRIC SOLIDNO WAYS.

ITEM	DESCRIPTION	QTY	UNIT
1	3/4\"/>	1	EA
2	3/4\"/>	1	EA
3	3/4\"/>	1	EA
4	3/4\"/>	1	EA
5	3/4\"/>	1	EA
6	3/4\"/>	1	EA
7	3/4\"/>	1	EA
8	3/4\"/>	1	EA
9	3/4\"/>	1	EA
10	3/4\"/>	1	EA
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99	3/4\"/>	1	EA
100	3/4\"/>	1	EA

ITEM	DESCRIPTION	QTY	UNIT
1	3/4\"/>	1	EA
2	3/4\"/>	1	EA
3	3/4\"/>	1	EA
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97	3/4\"/>	1	EA
98	3/4\"/>	1	EA
99	3/4\"/>	1	EA
100	3/4\"/>	1	EA

24. INNER RAD CAN

25. LOWER INNER CONE

25. UPPER INNER CONE

INNER CAN DETAILS	
1	11.5'±0.06 (0.01)
2	11.5'±0.06 (0.01)
3	11.5'±0.06 (0.01)
4	11.5'±0.06 (0.01)
5	11.5'±0.06 (0.01)
6	11.5'±0.06 (0.01)
7	11.5'±0.06 (0.01)
8	11.5'±0.06 (0.01)
9	11.5'±0.06 (0.01)
10	11.5'±0.06 (0.01)

INNER CAN DETAILS	
1	11.5'±0.06 (0.01)
2	11.5'±0.06 (0.01)
3	11.5'±0.06 (0.01)
4	11.5'±0.06 (0.01)
5	11.5'±0.06 (0.01)
6	11.5'±0.06 (0.01)
7	11.5'±0.06 (0.01)
8	11.5'±0.06 (0.01)
9	11.5'±0.06 (0.01)
10	11.5'±0.06 (0.01)

⑤

18

②

3

R

6 BOTTOM PLATE SUBASSEMBLY

29 BOTTOM PLATE

ITEM NO.		DESCRIPTION	QTY	UNIT	ASSEMBLY	DATE	BY	CHKD	APP'D
1	1	BOTTOM PLATE SUBASSEMBLY	1	EA	10-1-1960				
2	1	BOTTOM PLATE	1	EA	10-1-1960				
3	1	BOTTOM PLATE	1	EA	10-1-1960				
4	1	BOTTOM PLATE	1	EA	10-1-1960				
5	1	BOTTOM PLATE	1	EA	10-1-1960				
6	1	BOTTOM PLATE	1	EA	10-1-1960				
7	1	BOTTOM PLATE	1	EA	10-1-1960				
8	1	BOTTOM PLATE	1	EA	10-1-1960				
9	1	BOTTOM PLATE	1	EA	10-1-1960				
10	1	BOTTOM PLATE	1	EA	10-1-1960				
11	1	BOTTOM PLATE	1	EA	10-1-1960				
12	1	BOTTOM PLATE	1	EA	10-1-1960				
13	1	BOTTOM PLATE	1	EA	10-1-1960				
14	1	BOTTOM PLATE	1	EA	10-1-1960				
15	1	BOTTOM PLATE	1	EA	10-1-1960				
16	1	BOTTOM PLATE	1	EA	10-1-1960				
17	1	BOTTOM PLATE	1	EA	10-1-1960				
18	1	BOTTOM PLATE	1	EA	10-1-1960				
19	1	BOTTOM PLATE	1	EA	10-1-1960				
20	1	BOTTOM PLATE	1	EA	10-1-1960				
21	1	BOTTOM PLATE	1	EA	10-1-1960				
22	1	BOTTOM PLATE	1	EA	10-1-1960				
23	1	BOTTOM PLATE	1	EA	10-1-1960				
 

NOZZLE CARTRIDGE SUBASSEMBLY AND INSTALLATION	LABA
--	------

[illegible]

[illegible]

B-136

68 WELD NECK FLANGE

70 SPOOL PIECE

VIEW S

SURFACE FINISH VIEW

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1					ISSUED FOR FABRICATION
2					REVISION
3					REVISION
4					REVISION
5					REVISION

WELD NECK FLANGE AND SPOOL PIECE		MATERIAL	
ITEM NO	QTY	ITEM NO	QTY
1	1	2	1
3	1	4	1
5	1	6	1
7	1	8	1
9	1	10	1
11	1	12	1
13	1	14	1
15	1	16	1
17	1	18	1
19	1	20	1
21	1	22	1
23	1	24	1
25	1	26	1
27	1	28	1
29	1	30	1
31	1	32	1
33	1	34	1
35	1	36	1
37	1	38	1
39	1	40	1
41	1	42	1
43	1	44	1
45	1	46	1
47	1	48	1
49	1	50	1
51	1	52	1
53	1	54	1
55	1	56	1
57	1	58	1
59	1	60	1
61	1	62	1
63	1	64	1
65	1	66	1
67	1	68	1
69	1	70	1
71	1	72	1
73	1	74	1
75	1	76	1
77	1	78	1
79	1	80	1
81	1	82	1
83	1	84	1
85	1	86	1
87	1	88	1
89	1	90	1
91	1	92	1
93	1	94	1
95	1	96	1
97	1	98	1
99	1	100	1

- 1 DOWNGRADED AND TOLERANCES PER AND YELCO 1982. DOWNGRADES ARE 0.0005 INCHES. TOLERANCES: 0.0005 INCHES. 0.0005 INCHES. 0.0005 INCHES. 0.0005 INCHES.
- 2 ALL MACHINED SURFACES SHALL BE $R_{12.5}$ IN ACCORDANCE WITH AMS B46.1
- 3 BREAK ALL SHARP EDGES AND REMOVE ALL BURRS
- 4 MACHINED FULLET RADIUS SHALL BE .03 MAX
- 5 YELCO AND SPECIFIC FOR MS-A15-0013
- 6 HYPO FOR ASME B31.1, POWER PIPING CODE, DESIGN PRESSURE 300 PSI

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13</

10-~~MANIFOLD~~

7 ASSEMBLY ADAPTOR PLATE

8 RETAINER PLATE

7 WIPER

VIEW A

NEW A

FOR PARTS LIST AND GENERAL NOTES
SEE SHY 1

② ASSEMBLY, GAGE TUBE

DATE: 5/8 (BVL 11/4 126, SUCOM ROTAF(0 90)

[illegible][illegible]

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Table of Contents

- 1 - This page, general layout
- 2 - General component layout
- 3 - Cable assembly details

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LDUA
MASTER COPY

DRAWN BY: G. Hutchison		SPAR Aerospace Systems, Inc.	
CHECKED BY: K. K. K.		ORANGE COUNTY, FLORIDA	
FUNCTIONAL: DATE		LDUA Subsystem Controller	
REV: DATE		Pendant General Assembly	
NOTES: DATE		SIZE: CASE CODE	U/S NO: 200315
		SCALE: N/A	SHEET 1 of 3
CND GENERATED USING ORCAD RELEASE 384.1.2			

Notes:

- 1) This assembly drawing is only intended to show the general layout.
- 2) Only critical components are to be provided by assembly manufacturer.
- 3) Parts not shown are to be provided by assembly manufacturer.
- 4) All items in drawing 200315 are details, which is attached to pendant.
- 5) See sheet 3 for details on cable assembly, which is attached to pendant.
- 6) Pendant enclosure is listed in parts list, drawing 200315 as item A3.
- 7) See LDUA System Interconnection, drawing 200303, for details on cable connections.

TBD

pendant Component Layout

Spar Aerospace Limited	
Brampton, Ontario, Canada	
Title: Sub. S.C. Pendant General Assembly	
Manufacturing Number	
N	20015
DATE	2001-01-19
REV	A

Cable Designation	Length (meters)		Label "C" (theoretical)	Label "D" (theoretical)
	"A"	"B"		
-1	AS4MHL	10.3	10.0	AS4MHL

Part Number	Description	R1 - Terminator		R2 (ref. Table 3)		R3 - Label		Wiring as per Drawing			
		Part No.	Qty	Manuf.	Wire Type	Part No.	Qty	Manuf.	Part No.	Qty	
-1	AA30M Pendant	CTR 055EM-20-11V-150-112-13	1	Worm	15.12		755/706T75/225/AS	R2	W/27NMR	200516	-

Type	Description	Part No.	Manufacturer
15	Shield termination (#2288)	5763-3525-90	Raychem
16	9 gauge of #22 AWG TSP	5774	Baldwin

- 1) Label designators "C" and "D" are labelled with known designators as shown in table 1 followed by a 1) The last number - "H20223-XX" where "XX" is the dash number shown in table 2 and 2) "Row X", where "X" is the revision number of this drawing.
- 2) Each individual wire to be labelled with pin number of A1.
- 3) Each individual pairs to be terminated with and after shield terminator.

Approximately 5 centimeters of water is required.

Title	RAMPTON CRATLE Canada LINA S.C. Pendant General Assembly
Size/Document Number	200215
Date	June 7, 1981
Order	3 of 5

Call Number	Description	Manufacturer	PART TYPE (for Reference Only)	Order Part #	QUANTITY
A1	Joystick with boot, Push button, CT	Measurement Systems		521-BPS	1
A2	Terminal, CP2502, RS422, ext temp, 7-28VDC, backlite LEDs, hex keypad codes, custom silkscreen	Termiflex		99-5350-1001	1
A3	Pendant Enclosure	J.R.M Controls		FGP-02	1
S1:1	Switch, Key, 2 pos	Siemens		3SB1 100-4LB51	1
S1:2	Switch Contact N.O.	Siemens		3SB1 400-0B	1
S2:1	Switch PushB Mushroom	Siemens		3SB1 100-1HC51	1
S2:2	Switch Contact NC	Siemens		3SB1 400-0C	1
TB1:1	Terminal Block - 1 level	Phoenix	UK4	30 03 01 7	12
TB1:2	end cover	Phoenix	D-UK 4,10	30 03 02 0	1
TB1:3	Label	Phoenix	ZB6,1-4	ZB6,1-4	1
TB1:4	End clamp and Label	Phoenix	UBE with ES/KMK3	10 04 08 9	1
TB1:5	end clamp	Phoenix	E/UK	12 01 44 2	1
TB2:1	Terminal Block - 1 level	Phoenix	UK4	30 03 01 7	2
TB2:2	end cover	Phoenix	D-UK 4,10	30 03 02 0	1
TB2:3	Label	Phoenix	ZB6,1-4	ZB6,1-4	1
TB2:4	End clamp and Label	Phoenix	UBE with ES/KMK3	10 04 08 9	1
TB2:5	end clamp	Phoenix	E/UK	12 01 44 2	1
TB3:1	Terminal Block - 1 level	Phoenix	UK4	30 03 01 7	2
TB3:2	end cover	Phoenix	D-UK 4,10	30 03 02 0	1
TB3:3	Label	Phoenix	ZB6,1-4	ZB6,1-4	1
TB3:4	End clamp and Label	Phoenix	UBE with ES/KMK3	10 04 08 9	1
R1	resistor			16.9K 5% 0.5 Watt	1

This drawing contains confidential information that is proprietary and trade secret of the Government. It is to be controlled and its use is limited to the specific purpose for which it was developed. It is not to be distributed outside the limits of the contract without prior written consent of the Government.

Table of Contents

1 - This page

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Major System Unit Designation Number : A5
Minor System Unit Designation Number : A2

DRAWN BY: G. Sullivan		DATE: 8/7/96	
CHECKED BY: N. Smith		DATE: 8/7/96	
LDUA Console Subsystem General Assembly			
SHEET	CAGE CODE	DWG NO	REVISED BY
B	34309	200221	D
SCALE: N/A		SHEET 1 of 1	

OLD GENERATED USING ORCAD RELEASE 3A0-1.0

- NOTES:
- 1) See Control Panel Schematic, dwg 200222, for details.
 - 2) See 200223 for inter-late details.

Call Number	Description	Manuf.	PART TYPE (for reference only)	Order Part #	Quantity
S1:1	Switch Pushbutton momentary - White	Siemens		3SB1 118-0AG51	1
S1:2	Switch Contact N.O.	Siemens		3SB1 400-0B	1
L1:1	Lamp and holder 24V	Siemens		3SB1 400-2H	1
S2:1	Switch Pushbutton momentary - White	Siemens		3SB1 118-0AG51	1
S2:2	Switch Contact N.O.	Siemens		3SB1 400-0B	1
L2:1	Lamp and holder 24V	Siemens		3SB1 400-2H	1
S3:1	Switch Push Button 24V DPST	Allen-Bradley		800H-FRXTQ24XA	1
S3:2	illuminated Red Push-Twist Mushroom Head for Pushbutton	Allen-Bradley		800T-N306R	1
S4:1	Switch Pushbutton momentary - White	Siemens		3SB1 118-0AG51	1
S4:2	Switch Contact N.O.	Siemens		3SB1 400-0B	1
L4:1	Lamp and holder 24V	Siemens		3SB1 400-2H	1
S5:1	Switch Push Button 24V DPST	Allen-Bradley		800H-FRXTQ24XA	1
S5:2	illuminated Yellow Push-Twist Mushroom Head for Pushbutton	Allen-Bradley		800T-N306A	1
L5:1	Pilot Light - Red	Siemens		3SB1 118-6SC51	1
L5:2	Lamp and holder 24V	Siemens		3SB1 400-2H	1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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GENERAL COPY

REV. 12
12/1/64

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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BRACE PLATE FOR
LOADS

REV. 12
12/1/64

PARTS LIST

SPAR SPACE SYSTEMS
9445 AIRPORT ROAD, BRAMPTON, ONTARIO, CANADA L6S 4J3

38309 94:10:06

1220022

LIST TITLE

AUTHENTICATION

SHEET 2 OF 5

TOOL INTERFACE PLATE ASSEMBLY

DWG NO 200322

FIND NO	QTY REQD — 1	QTY REQD	QTY REQD	CODE	PART OR IDENTIFYING NO	DRAWING/DOCUMENT	NOMENCLATURE OR DESCRIPTION	SUPPL LIST	NOTES				
						NUMBER							
REF					200322-1	200322	TOOL INTERFACE PLATE ASSEMBLY						
1	1				200302-1	200302	PLATE, TIP						
2	1				200315-1	200315	MOUNTING PLATE						
3	1				200316-1	200316	SHAFT, TIP						
4	2				200316-3	200316	SHAFT, TIP						
5													
6													
7	3				200320-1	200320	STUD, TIP						
8	1				200321-1	200321	CAM INSTALLATION TOOL						
9	3				200408-1	200408	WASHER						
LTR	DESCRIPTION			DATE	APPD	LTR	DESCRIPTION	DATE	APPD	LTR	DESCRIPTION	DATE	APPD

CAD GENERATED USING AUTOCAD RELEASE 12

0322P1

B-159

HNF-2964, Revision 0

PARTS LIST		Spar Aerospace Limited SPAR SPACE SYSTEMS 9445 AIRPORT ROAD, BRAMPTON, ONTARIO, CANADA L6S 4J3		CAGE CODE 38309		ORIG DATE 94:10:06		PL200322			
LIST TITLE TOOL INTERFACE PLATE ASSEMBLY						AUTHENTICATION		SHEET 3 OF 5 DWG NO 200322			
FIND NO	QTY REQD — 1	QTY REQD	QTY REQD	CODE	PART OR IDENTIFYING NO	DRAWING/DOCUMENT		NOMENCLATURE OR DESCRIPTION	SUPPL LIST	NOTES	
						NUMBER					
10	3				200323-1	200323		PIN, QUICK-RELEASE			
11	3				200409-3	200409		SPACER, TOOL			
12	3				200340-1	200340		COUPLER, TIP			
13	1				200409-1	200409		SPACER, TOOL			
14	1				200411-1	200411		NUT, TOOL			
15	1			02697	E0740-75 2-170			O-RING, SEAL (PARKER)			
16	33			00141	D6-27			WASHER, BELLEVILLE SPRING (PRECISION INDUSTRIAL COMPONENTS CORP)			
17	3			02697	E0740-75 2-218			O-RING, SEAL (PARKER)			
18	3				200317-1	200317		BUSHING, SHAFT			
19	3				200317-3	200317		BUSHING, SHAFT			

LTR	DESCRIPTION	DATE	APPD	LTR	DESCRIPTION	DATE	APPD	LTR	DESCRIPTION	DATE	APPD

CAD GENERATED USING AUTOCAD RELEASE 12

0322P1

B-160

HN-2964, Revision 0

PARTS LIST		Spar Aerospace Limited SPAR SPACE SYSTEMS 9445 AIRPORT ROAD, BRAMPTON, ONTARIO, CANADA L6S 4J3				CAGE CODE 38309		ORIG DATE 94:10:06		PL200322			
LIST TITLE TOOL INTERFACE PLATE ASSEMBLY						AUTHENTICATION			SHEET 4 OF 5 DWG NO 200322				
FIND NO	QTY REQD -1	QTY REQD	QTY REQD	CODE	PART OR IDENTIFYING NO	DRAWING/DOCUMENT		NOMENCLATURE OR DESCRIPTION	SUPPL LIST	NOTES			
						NUMBER							
20	3				200319-1	200319		SPACER, SHAFT					
21	3			07382	SH-75-SS			RETAINING RING (ROTOR CLIP)					
22	1			02697	E0740-75 2-273			O-RING, SEAL (PARKER)					
23	3			07382	HO-150-SS			RETAINING RING (ROTOR CLIP)					
24													
25	2			96906	MS9390-420	MS9390		PIN, STRAIGHT, DOWEL .25 X .50 LG					
26	2			96906	MS9390-180	MS9390		PIN, STRAIGHT, DOWEL .125 X .50 LG					
27													
28	AR				1000C40-35	1000C40		ADHESIVE, (SOLITHANE)					
29	A/R			U0638	C130			LUBRICANT, NUCLEOL (BURMAH, CASTROL UK)					
LTR	DESCRIPTION			DATE	APPD	LTR	DESCRIPTION			DATE	APPD

CAD GENERATED USING AUTOCAD RELEASE 12

0322P1

B-161

HN-2964, Revision 0

PARTS LIST

Spar Aerospace Limited

SPAR SPACE SYSTEMS
9445 AIRPORT ROAD, BRAMPTON, ONTARIO, CANADA L6S 4J3

SPAR

CAGE CODE

38309

ORIG DATE

94:10:06

PL200322

LIST TITLE

TOOL INTERFACE PLATE ASSEMBLY

AUTHENTICATION

SHEET 5 OF 5

DWG NO 200322

TOOL INTERFACE PLATE ASSEMBLY															
FIND NO	QTY REQD —1	QTY REQD	QTY REQD	CODE	PART OR IDENTIFYING NO	DRAWING/DOCUMENT		NOMENCLATURE OR DESCRIPTION	SUPPL LIST	NOTES					
						NUMBER									
30															
31															
32															
33	6			10060	NAS1352C06-8	NAS1352		SCREW, CAP, SOCKET HEAD .138-32 UNC X .500 LG							
34	12			10060	NAS1351C3-8	NAS1351		SCREW, CAP, SOCKET HEAD .190-32 X .500 LG							
35															
36															
37															
38	12			96906	MS51848-49	MS51848		WASHER, LOCK, HI-COLLAR #10							
39	6			96906	MS51848-46	MS51848		WASHER, LOCK, HI-COLLAR #6							
LTR	DESCRIPTION			DATE	APPD	LTR	DESCRIPTION	DATE	APPD	LTR	DESCRIPTION	DATE	APPD		

CAD GENERATED USING AUTOCAD RELEASE 12

0322P1

B-162

HNF-2964, Revision 0

APPENDIX C

RED-LINE MARKUPS

H-6-1411 (ESSENTIAL)

POWER INTERFACE MODULE (PIM) 5140
SUPPLY 490 VAC

POWER DISTRIBUTION SKID 5130

OPERATIONS OVERVIEW VIDEO 8200

AT-TANK INSTRUMENT ENCLOSURE (ATIE) 4300
H-6-1413 (ESSENTIAL)

IN-TANK VIDEO SYSTEM 110 VAC

VERTICAL POSITIONING MAST (VPM) 2200

HEPA FILTER

MOBILE DEPLOYMENT SYSTEM (MDS) 2100

LDUA SUBSYSTEM CONTROLLER 2400

GRIPPER END EFFECTOR (GEE) 6510

HIGH RESOLUTION STEREO VIDEO SYSTEM (HRSVS) 6230

EXTENDED REACH END EFFECTOR (EREE)

LDUA 2300

LDUA SYSTEM BLOCK DIAGRAM

U.S. DEPARTMENT OF ENERGY

PURGE AIR SUPPLY SYSTEM 5230
H-6-14150 (ESSENTIAL)

DECON SUPPLY WATER SYSTEM 3340
H-6-14342 (ESSENTIAL)

OPERATIONS OVERVIEW VIDEO 8200

AT-TANK INSTRUMENT ENCLOSURE (ATIE) 4300
H-6-1413 (ESSENTIAL)

IN-TANK VIDEO SYSTEM 110 VAC

HEPA FILTER

MOBILE DEPLOYMENT SYSTEM (MDS) 2100

LDUA SUBSYSTEM CONTROLLER 2400

GRIPPER END EFFECTOR (GEE) 6510

HIGH RESOLUTION STEREO VIDEO SYSTEM (HRSVS) 6230

EXTENDED REACH END EFFECTOR (EREE)

LDUA 2300

PURGE AIR SUPPLY SYSTEM 5230
H-6-14150 (ESSENTIAL)

DECON SUPPLY WATER SYSTEM 3340
H-6-14342 (ESSENTIAL)

OPERATIONS OVERVIEW VIDEO 8200

AT-TANK INSTRUMENT ENCLOSURE (ATIE) 4300
H-6-1413 (ESSENTIAL)

IN-TANK VIDEO SYSTEM 110 VAC

HEPA FILTER

MOBILE DEPLOYMENT SYSTEM (MDS) 2100

LDUA SUBSYSTEM CONTROLLER 2400

GRIPPER END EFFECTOR (GEE) 6510

HIGH RESOLUTION STEREO VIDEO SYSTEM (HRSVS) 6230

EXTENDED REACH END EFFECTOR (EREE)

LDUA 2300

PURGE AIR SUPPLY SYSTEM 5230
H-6-14150 (ESSENTIAL)

DECON SUPPLY WATER SYSTEM 3340
H-6-14342 (ESSENTIAL)

OPERATIONS OVERVIEW VIDEO 8200

AT-TANK INSTRUMENT ENCLOSURE (ATIE) 4300
H-6-1413 (ESSENTIAL)

IN-TANK VIDEO SYSTEM 110 VAC

HEPA FILTER

MOBILE DEPLOYMENT SYSTEM (MDS) 2100

LDUA SUBSYSTEM CONTROLLER 2400

GRIPPER END EFFECTOR (GEE) 6510

HIGH RESOLUTION STEREO VIDEO SYSTEM (HRSVS) 6230

EXTENDED REACH END EFFECTOR (EREE)

LDUA 2300

HOSELINE COMPRESSED AIR ENTER
FROM THE RIGHT
INFO BY JANSSEN INTERNATIONAL

SUPPORT BRACKET
BOTH ENDS

SUPPORT BRACKET
BOTH ENDS

HEAT CONTROL ENCLOSURE
PRESSURE SWITCH
PART NO. 1P0104XX
INFO BY SOURCE D

PRESSURE GAUGE
0-200 PSI/G

WATER (TYP) 1 hp
PUMP
PULLEY 3/4" DIA. 4.45 OD
INFO BY BROWNE

OUT-LESS AIR COMPRESSOR
0.25 HP
IOWATA AIR COMPRESSOR No. 90.
PART NO. 12420-116
INFO BY CONTROL DEVICES INC

ON/OFF SWITCH
(PULLEY SWITCH)
(REDUCED CIRCUIT)

HOSE WATER
PART NO. 12420-116
INFO BY BROWNE

WATER TAP

WATER INDICATOR

HOSE WATER
PART NO. 12420-116
INFO BY BROWNE

HOSE WATER
PART NO. 12420-116
INFO BY BROWNE

PURGE VALVE
PART NO. B-10414
INFO BY SWANSON

SAFETY VALVE 150 PSI
PART NO. 572-150
INFO BY COMPACT CONTROLS

PURGE AIR SUPPLY ASSY

AIR RECEIVER
PART NO. 12420-116
INFO BY BROWNE

By SPEEDAIR

WATER BELT
SLOT 8/16

BEZEL/NO
PART NO. 12420-116
INFO BY COMPACT CONTROLS

PURGE ASSEMBLY
PART NO. 12420-116
INFO BY JANSSEN INTERNATIONAL

WATER TAP
PART NO. 12420-116
INFO BY BROWNE

DEF. NOTE DRUMETAL
3x4 INCHES WITH
1/4 IN. HIGH
LETTERS

NAME TAG

PART NO. H-6-14099-1
LDUA PURGE AIR SUPPLY
SYSTEM NO. 5230
SERIAL NO. 00XXX

BOTH Compressors Tied down in
Carrying pan mounted to front of
LDUA truck - pan Dwg 2
DO NOT HAVE SHT. 2

6/9/88
JAN

SPECIFICATION CONTROL DRAWING

LDUA
PURGE AIR SUPPLY
ASSEMBLY

REV	DATE	BY	CHK	DESCRIPTION
1	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
2	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
3	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
4	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
5	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
6	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
7	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
8	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
9	12/1/87	JAN	LD	ISSUED FOR PRODUCTION
10	12/1/87	JAN	LD	ISSUED FOR PRODUCTION

H-6-14099

3. EXTERNAL POWER CABLE TO BE 75' LG, #2 AWG, 5 CONDUCTOR, TYPE 2, 90° C WITH MELTRIC MATING CONNECTORS. TWO (2) CABLES PROVIDED FOR CABLE DRAWING, SEE H-6-14105 (200400).

CK

— 102.00

MedSigna
1-800-746-6666
(202) 378-1100

C - 5

INTERIOR ELEVATION
CURBSIDE

DATE	11/1/85
BY	JPD
PROJECT	U.S. DEPARTMENT OF ENERGY
LOCATION	LOUISIANA OPERATIONS
TRAILER	CONTROL TRAILER
TRAILER NO.	H-6-14100
REV.	0
DATE	11/1/85
BY	JPD
PROJECT	U.S. DEPARTMENT OF ENERGY
LOCATION	LOUISIANA OPERATIONS
TRAILER	CONTROL TRAILER
TRAILER NO.	H-6-14100
REV.	0

FLOOR PLAN

C-7

COMS
check out
6/24
DMS
VanH
95

WIRING DIAGRAM
FOR ELECTRICAL LAYOUT, SEE H-6-14102 (200383).

POWER DISTRIBUTION

POWER PANEL #1 150 AMP MAIN 208 VOLT 3Ø INSTRUMENT POWER				POWER PANEL #2 110 AMP MAIN 208 VOLT 3Ø UTILITY POWER			
CKT #	DESCRIPTION	AMPS	CKT #	DESCRIPTION	AMPS	CKT #	DESCRIPTION
1	RACK1 POWER STRIP	20A	22	A6 OVER/UNDER RELAY	10A	1	FORWARD LIGHTS
2	RACK2 POWER STRIP	20A	23	B6 OVER/UNDER RELAY	10A	2	REAR LIGHTS
3	RACK3 POWER STRIP	20A	24	C6 OVER/UNDER RELAY	10A	3	WATER COOLER
4	RACK4 POWER STRIP	20A	25			4	CONVENIENCE OUTLETS
5	RACK5 POWER STRIP	20A	26			5	OUTSIDE OUTLETS
6			27			6	
7			28			7	COMPRESSOR #1
8			29			8	
9			30			9	
10			31			10	COMPRESSOR #2
11	RACK2 OUTLET	30A	32			11	
12	RACK4 OUTLET	30A	33			12	EVAPORATORS 1A & 1B
13	RAMAN CHILLER	30A	34			13	
14	RAMAN RACK	20A	35			14	EVAPORATORS 2A & 2B
15	OUTLET FORWARD CURBSIDE	20A	36			15	
16	OUTLET FORWARD STREETSIDE	20A	37			16	CONDENSOR FAN #1
17	PLUGMOLD MIDDLE STREETSIDE	20A	38			17	
18	PLUGMOLD REAR STREETSIDE	20A	39			18	SPARE
19	PLUGMOLD REAR CURBSIDE - UPPER	20A	40			19	SPARE
20	PLUGMOLD REAR CURBSIDE - LOWER	20A	41			20	SPARE
21	MONITOR OUTLETS	20A	42			21	SPARE

BRJ
6/15/98

Done
6/24/98

DRAWING TRACKABILITY LIST		REV NUMBER		TILE		DESCRIPTION		REV		DATE		BY		CHK		APP		DATE		BY		CHK		APP	
H-6-14100		1		H-6-14100		H-6-14100		1		1/20		1/20		1/20		1/20		1/20		1/20		1/20		1/20	

U.S. DEPARTMENT OF ENERGY DOE Field Office, Hanford Washington Hanford Company		LDUA OPERATIONS CONTROL TRAILER HANFORD	
DATE: 1/20/98 BY: 6000C CHK: 1/20		DATE: 1/20/98 BY: 605195 CHK: 1/20

VIEW A-A
UNDERCARRIAGE

all 3Ø

4/9/98
[Signature]

OK
AS
IS
No Changes
RAD

DRAWING TRACK/CLAMP LIST		TITLE		REF. NUMBER		REFERENCES		REVISIONS		CONTRACT		PROJECT		SHEET	
NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION
1	UNDERCARRIAGE	1	UNDERCARRIAGE	1	UNDERCARRIAGE	1	UNDERCARRIAGE	1	UNDERCARRIAGE	1	UNDERCARRIAGE	1	UNDERCARRIAGE	1	UNDERCARRIAGE

PARTITION

INTERFACE PANEL

TRAILER COCKED, ACCESS
TO INTERFACE

REV	DATE	BY	CHKD	DESCRIPTION
1	1/20/88	WJ	WJ	ISSUED FOR CONSTRUCTION
2	1/20/88	WJ	WJ	REVISED TO ADD EXTERIOR CABLE ACCESS
3	1/20/88	WJ	WJ	REVISED TO ADD FIBER OPTIC MODULE
4	1/20/88	WJ	WJ	REVISED TO ADD 24 PORT EACH, 2 PL
5	1/20/88	WJ	WJ	REVISED TO ADD 3M PART NO 8174
6	1/20/88	WJ	WJ	REVISED TO ADD CRF 4100A30A1
7	1/20/88	WJ	WJ	REVISED TO ADD 4100A30A2
8	1/20/88	WJ	WJ	REVISED TO ADD EXTERIOR CABLE ACCESS
9	1/20/88	WJ	WJ	REVISED TO ADD FIBER OPTIC MODULE
10	1/20/88	WJ	WJ	REVISED TO ADD 24 PORT EACH, 2 PL
11	1/20/88	WJ	WJ	REVISED TO ADD 3M PART NO 8174
12	1/20/88	WJ	WJ	REVISED TO ADD CRF 4100A30A1
13	1/20/88	WJ	WJ	REVISED TO ADD 4100A30A2
14	1/20/88	WJ	WJ	REVISED TO ADD EXTERIOR CABLE ACCESS
15	1/20/88	WJ	WJ	REVISED TO ADD FIBER OPTIC MODULE
16	1/20/88	WJ	WJ	REVISED TO ADD 24 PORT EACH, 2 PL
17	1/20/88	WJ	WJ	REVISED TO ADD 3M PART NO 8174
18	1/20/88	WJ	WJ	REVISED TO ADD CRF 4100A30A1
19	1/20/88	WJ	WJ	REVISED TO ADD 4100A30A2
20	1/20/88	WJ	WJ	REVISED TO ADD EXTERIOR CABLE ACCESS

McGraw-Hill

U.S. DEPARTMENT OF ENERGY
LIDIA OPERATIONS
CONTROL TRAILER

DATE: 1/20/88
BY: WJ
CHKD: WJ
APP: WJ
REV: 1/20/88

EQUIPMENT RACKS

REV	NO	DATE	BY	CHKD	DESCRIPTION
1	1	10/10/88	W. J. WILSON		ISSUED FOR CONSTRUCTION

U.S. DEPARTMENT OF ENERGY
Nuclear Energy Research Institute
Hanford Site
PACIFIC NORTHWEST LABORATORY
Richland, WA 99352

PROJECT: LBL-2000-001
SUBJECT: LBL-2000-001
DRAWING NO: HNF-2964
REV: 0
DATE: 10/10/88
BY: W. J. WILSON
CHKD: [blank]
TITLE: EQUIPMENT RACKS

OK
AS IS

PLANTER LOCKED
NO ACCESS

6/9/98
[Signature]

QTY	PART	DESCRIPTION	MANUFACTURER	ITEM
1	17067A1008	THERMOSTAT	HONEYWELL	1
1	W973J1009	LOGIC PANEL	HONEYWELL	2
2	P72MA-1	SWITCH, HIGH/LOW PRESS	SW #1, SW #2 PENN	3
2	P70AA-118	SWITCH, FAN CYCLING	SW #1, SW #2 PENN	4
3	268	RELAY, OVER/UNDER VOLTAGE	AP, BP, CP TIME MARK	5
2	700-HT128A1	RELAY, TIMING	K20, K21 ALLEN-BRADLEY	6
5	700-HN125	BASE	AP, BP, CP, K20, K21 ALLEN-BRADLEY	7
1	CUA-41-70001	RELAY, TIME DELAY, 1 SEC	POTTER BRUMFIELD	8
7	700-HB33A24	RELAY K16,K17,K18,K19,K22,K23,K24	ALLEN-BRADLEY	9
8	700-HN127	BASE K16,K17,K18,K19,K22,K23,K24	ALLEN-BRADLEY	10
2	W42	OVERLOAD HEATER	K5, K14 ALLEN-BRADLEY	11
2	W44	OVERLOAD HEATER	K3, K12 ALLEN-BRADLEY	12
4	509-AOXD	STARTER MOTOR	K3, K5, K12, K14 ALLEN-BRADLEY	13
4	500L-BOD92	CONTACTOR, AC	K6, K7, K8, K9 ALLEN-BRADLEY	14
4	700-P400-A1	RELAY, AC	K2, K4, K11, K13 ALLEN-BRADLEY	15
6	W62	OVERLOAD HEATER	K1, K10 ALLEN-BRADLEY	16
2	509-BOD	STARTER MOTOR	K1, K10 ALLEN-BRADLEY	17

BRJ 6/8/98

Change Drawing or not? K.O.W. 6/4

Done 6/29

REV	NO	DATE	DESCRIPTION	BY	CHKD	APPD
1	1	6/8/98	INCORPORATED ECR # 624878			
2	2	6/8/98	REVISIONS			
3	3	6/8/98	REVISIONS			
4	4	6/8/98	REVISIONS			
5	5	6/8/98	REVISIONS			
6	6	6/8/98	REVISIONS			
7	7	6/8/98	REVISIONS			
8	8	6/8/98	REVISIONS			
9	9	6/8/98	REVISIONS			
10	10	6/8/98	REVISIONS			

MANIPULATION	12/25/98	U.S. DEPARTMENT OF ENERGY
FRANCO	12/25/98	DOE Field Office, Richmond
FRANCO	12/25/98	WASHINGTON, D.C.
FRANCO	12/25/98	WASHINGTON, D.C.
FRANCO	12/25/98	WASHINGTON, D.C.
FRANCO	12/25/98	WASHINGTON, D.C.
FRANCO	12/25/98	WASHINGTON, D.C.
FRANCO	12/25/98	WASHINGTON, D.C.
FRANCO	12/25/98	WASHINGTON, D.C.
FRANCO	12/25/98	WASHINGTON, D.C.
FRANCO	12/25/98	WASHINGTON, D.C.

4

375-5262 ID: Kathy Orr

FRN 1
HNF 3044
6/23

06/23/98 10:20
08/23/98 09:46

15093761045
15093763974

FNEF
FDNW 1200 Jad

001
003

ATTACHMENT TO H-6-14102 SHEET 1

GEC - Ground Electrode Conductor
Peg - Primary Equip Gnd
Seg - Sec. equip gnd.

Hoffman

BH 6/8/98

1. ALL TERMINAL LUGS MUST BE 75° C RATED.
2. ALL CURRENT CARRYING CONDUCTORS MUST BE THWN.
3. PRIMARY EQUIPMENT GROUND IS FOURTH (4) PIN ON METRIC SERVICE HEAD.
4. GROUNDING ELECTRODE CONDUCTOR IS FIFTH (5) PIN ON METRIC SERVICE HEAD.
5. EACH TRANSFORMER XO SHALL BE BONDED TO IT'S RESPECTIVE POWER PANEL NEUTRAL BUSS INSIDE TRAILER.
6. GROUNDING ELECTRODE CONDUCTOR CONNECTION POINT SHALL BE IRREVERSIBLE COMPRESSION LUG OR EXOTHERMIC WELD.
7. THE NEUTRAL BUSS AT EACH INSIDE PANEL BOARD SHALL BE BONDED TO IT'S RESPECTIVE GROUND BUSS.

ELECTRICAL TORQUE SPECIFICATIONS		
METRIC SERVICE HEAD AND CORD CONNECTORS	90-95 IN LBS	
MAIN BREAKER	250 IN LBS	
50 & 60 AMP DISCONNECTS	#3 AWG	50 IN LBS
	#6 AWG	35 IN LBS
BRANCH CIRCUIT BREAKERS	36 IN LBS	
A.B. STARTERS & CONTACTORS	20 IN LBS	
A.B. RELAYS	15 IN LBS	
PANEL BOARDS	180-250 IN LBS	
GROUND TERMINALS	50 IN LBS	
SWITCHES & RECEPTACLES	#10 AWG	18 IN LBS
	#12 AWG	16 IN LBS
	#14 AWG	14 IN LBS

LEGEND	
————	PRIMARY EQUIPMENT GROUND
- - - -	SECONDARY EQUIPMENT GROUND
— — — —	GROUNDING ELECTRODE CONDUCTOR
	EMT OR RIGID CONDUIT

SERVICE EQUIPMENT LAYOUT AND GROUNDING SCHEME

S 1		INCORPORATED ECN 624876		SWIFT	TEST	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
10/20		10/20		10/20		10/20		10/20		10/20		10/20	
REF NO		TITLE		REFERENCES		TITLE		REFERENCES		TITLE		REFERENCES	
DWD NO		TITLE		REFERENCES		TITLE		REFERENCES		TITLE		REFERENCES	
DRAWING TRACEABILITY LIST		NEXT USED ON		11-6-14100 (200378)		SADFILE		F01402A		LADGCODE		DDS:5.G.A0121.03.0.5	

[illegible]

QUANTITIES
SHOWN ARE
FOR 2
SYSTEMS

no access to trailer

[illegible]

QTY	PART NO.	DESCRIPTION	MANUFACTURER ITEM
N/A	9900000	GENERAL REQUIREMENTS	
1	31-9241-P-9M12	CONNECTOR, MALE, 4 POLE, 5 WIRE	MELTRIC 1
1	31-9241-P-9M12-AS	CONNECTOR, FEMALE, 4 POLE, 5 WIRE	MELTRIC 2
2		STRAIN RELIEF, 1.50 I.D.	
3			
4			
5			
6		CABLE, 5 CONDUCTOR, #2 AWG, TYPE W, 90 C

WIRING	
PIN 1	BLK
PIN 2	GRN
PIN 3	RED
N	WHT (SRN TAPE)
GRD	GRN

BRF
6/15/98

1

MANUFACTURER'S SPECIFICATION

U.S. DEPARTMENT OF ENERGY

5

CABLE TRAILER
POWER SUPPLY,
480V/3P

Change 1
Due to
K. D. D. Change
6/15/98

4

K.O. 6/23/98

B.R. 6/15/98

DRAWING TRACKABILITY LIST		NEXT USED ON GND REV		CAPABLE FOR 10/10/74		REVISIONS		LAYOUT		OPERATIONS CONTROL TRAILER	
DWG NO	TITLE	REV	DATE	REV	DATE	REV	DATE	REV	DATE	REV	DATE
H-6-14114	VIDEO SYS INTERCONNECTION DIAG	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14113	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14112	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14111	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14110	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14109	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14108	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14107	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14106	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14105	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14104	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14103	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14102	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14101	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100
H-6-14100	COMMON OPERATIONS CONTROL TRAILER	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100	1	11-8-14100

U.S. DEPARTMENT OF ENERGY
GENERAL ATOMICS CORPORATION
OPERATIONS CONTROL TRAILER
LAN & VIDEO CABLE LAYOUT
H-6-14107
REV 1
DATE 11/8/100

ONE LINE DIAGRAM

NOTES:

1. ELECTRICAL INSTALLATION SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE, 1993 EDITION.
 2. FIELD ROUTE WIRE AND SUPPORT AS REQUIRED.
 3. SEE ATTACHED GROUND LAYOUT (SHEET 5).
 4. BOND RIGIDITY AND GROUND CONDUCTORS IN ENCLOSURE.
 5. ALL CIRCUIT BREAKER TERMINAL LUGS SHALL BE RATED 75° C.
1. SUPPLY BREAKERS MUST BE RATED AT 22,000 AC.

BR/Ph
8/10/98

NO. TO	TITLE	REV. NO.	REV. DATE	REV. BY	REV. DESCRIPTION
1	POWER DISTRIBUTION PACK	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC
2	ONE LINE DIAGRAM & DETAILS	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC
3	GROUND LAYOUT	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC
4	WIRING DIAGRAM	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC
5	SCHEMATIC	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC
6	PHOTOGRAPH	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC
7	VIDEO	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC
8	3D MODEL	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC
9	OTHER	1	8/10/98	BR/Ph	REVISED FOR 22,000 AC

U.S. DEPARTMENT OF ENERGY
OFFICE OF FIELD ACTIVITIES
WASH. DC 20545

LDU A
POWER DISTRIBUTION PACK
ONE LINE DIAGRAM & DETAILS
F 6000 7202 H-6-141110

NOTES:

- 1. BOND AND NEUTRAL GROUND CONDUCTORS AT ENCLOSURE DO NOT BOND ANY NEUTRAL CONDUCTORS. CONDUCTORS SHALL BE BONDING STRIP OR MANUFACTURER'S BONDING SCREW IF AVAILABLE.
- 2. BOND EQUIPMENT GROUNDING CONDUCTORS TO TRANSFORMER CASE OR MANUFACTURER'S SPECIFIED BOND POINT.
- 3. GROUND BUS SHOULD BE A MECHANICAL PRESSURE TYPE CONNECTOR ABLE TO ACCEPT AT LEAST A #4 AWG COPPER CONDUCTOR.
- 4. TYPICAL: GND BUS AND ALL NON-CURRENT CARRYING METAL PARTS SHALL BE BOND TO THE ENCLOSURE WITH AN APPROPRIATELY SIZED BONDING STRIP OR BONDING SCREW IF AVAILABLE.

Blp
6/10/98

DRAWING TITLE: POWER DISTRIBUTION RACK	
REF. NUMBER: HNF-29045	
DATE: 6/10/98	
DESIGNED BY: [Signature]	
CHECKED BY: [Signature]	
APPROVED BY: [Signature]	
PROJECT NUMBER: H-6-141110	
SHEET NUMBER: 1	
TOTAL SHEETS: 1	
U.S. DEPARTMENT OF ENERGY	
NATIONAL LABORATORY	
POWER DISTRIBUTION RACK	
GROUND LAYOUT	
H-6-141110	

U.S. DEPARTMENT OF ENERGY WATERPOUR TESTING COMPANY		L.D.U.A. SYSTEM POWER DISTRIBUTION CABLE ASST'S	
H-6-14112		200 0 5903	
10/28/86		10/28/86	
1		2	
3		4	
5		6	
7		8	
9		10	
11		12	
13		14	
15		16	
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25		26	
27		28	
29		30	
31		32	
33		34	
35		36	

REV	NO	DATE	BY	CHKD	DESCRIPTION
010	01	10/28/86			INITIAL/REVISION
020	02				ASSEMBLY, CABLE 5100W2A
030	03				ASSEMBLY, CABLE 5100W1A
040	04				ASSEMBLY, CABLE 5100W3A
050	05				ASSEMBLY, CABLE 5100W4A
060	06				ASSEMBLY, CABLE 5100W5A
070	07				ASSEMBLY, CABLE 5100W6A
080	08				ASSEMBLY, CABLE 5100W7A
090	09				ASSEMBLY, CABLE 5100W8A
100	10				ASSEMBLY, CABLE 5100W9A
110	11				ASSEMBLY, CABLE 5100W10A
120	12				ASSEMBLY, CABLE 5100W11A
130	13				ASSEMBLY, CABLE 5100W12A
140	14				ASSEMBLY, CABLE 5100W13A
150	15				ASSEMBLY, CABLE 5100W14A
160	16				ASSEMBLY, CABLE 5100W15A
170	17				ASSEMBLY, CABLE 5100W16A
180	18				ASSEMBLY, CABLE 5100W17A
190	19				ASSEMBLY, CABLE 5100W18A
200	20				ASSEMBLY, CABLE 5100W19A
210	21				ASSEMBLY, CABLE 5100W20A
220	22				ASSEMBLY, CABLE 5100W21A
230	23				ASSEMBLY, CABLE 5100W22A
240	24				ASSEMBLY, CABLE 5100W23A
250	25				ASSEMBLY, CABLE 5100W24A
260	26				ASSEMBLY, CABLE 5100W25A
270	27				ASSEMBLY, CABLE 5100W26A
280	28				ASSEMBLY, CABLE 5100W27A
290	29				ASSEMBLY, CABLE 5100W28A
300	30				ASSEMBLY, CABLE 5100W29A
310	31				ASSEMBLY, CABLE 5100W30A
320	32				ASSEMBLY, CABLE 5100W31A
330	33				ASSEMBLY, CABLE 5100W32A
340	34				ASSEMBLY, CABLE 5100W33A
350	35				ASSEMBLY, CABLE 5100W34A

8. Cable lengths shown are approximate.
Length determined by fabricator.

- GENERAL NOTES: (UNLESS OTHERWISE SPECIFIED)
- MULTIPLE ASSEMBLIES OF THE SAME CONFIGURATION SHALL BE IDENTIFIED BY CHANGING THE LAST ALPHA CHARACTER TO THE NEXT SEQUENTIAL ALPHA CHARACTER.
 - FIELD TO DETERMINE CONDUCTOR COLOR/CONNECTOR PIN ASSIGNMENTS AS REQUIRED. A PIN/SOCKET CONTINUITY CHECK (PER THE APPLICABLE ASSEMBLY) SHALL BE PERFORMED AFTER THE ASSEMBLY OF EACH CABLE.
 - CONNECTORS SHALL BE IDENTIFIED USING A WEATHER-RESISTANT MARKING. CONNECTORS SHALL BE IDENTIFIED BY PLACING THE CABLE NUMBER IN FRONT OF THE CONNECTOR NUMBER. (EXAMPLE, CABLE 5100W2A / CONNECTORS 5100W2A1 AND 5100W2A2)
 - CABLE TO INCLUDE THREE PHASE CONDUCTORS & GND.
 - CABLE TO INCLUDE TWO PHASE CONDUCTORS & GND.

C-25
K.O.
4/3
6/19/86

GENERAL NOTES

- NUMBERS IN PARENTHESIS REFER TO TEMPORARY CABLE NUMBERS USED DURING CABLE INSTALLATION.
- CABLES 4100W1 AND 4100W2 ARE OPTICAL CABLE CORPORATION P/N B12-110C-W3P/10C/300-ML 3 SERIES MILITARY TACTICAL FIELD CABLE WITH FLAME RETARDANT JACKET, 12 FIBER, 62.5/125 MICRON, 308/KM, 400MHZ-KM @ 850NM, 105/KM, 600MHZ-KM @ 1300 NM, PRE-TERMINATED WITH TYPE ST CONNECTORS, EACH CABLE 900 FEET LONG.

CONTINUED FROM H-6-14113, SH1

*Drawing OK
No chances needed.
BRJ 6/16/88*

U.S. DEPARTMENT OF ENERGY DOE, First Office, Phoenix Westinghouse Nuclear Company	
FIBER-OPTIC UMBILICAL INTERCONNECTION DIAG	
DRAWING NO. 200 G 5903 DATE 7/23/88	SHEET 1 OF 1

A5-1R-01-WHT-01
16

A5-1R-02-WHT-01
16

A5-1R-03-WHT-01
16

A5-1R-04-WHT-01
16

A5-1R-01-BLK-01
16

A5-1R-02-BLK-01
16

A5-1R-03-BLK-01
16

A5-1R-04-BLK-01
16

VIDEO SWITCHER INPUT SPLITTER PANEL

Change labels to those shown wiring ok.

6/15/88

GENERAL NOTES
CABLES CONNECTING INPUT SPLITTER PANEL TO OUTPUT PANEL AT THE REAR OF THE VIDEO SWITCHER SHALL BE 75Ω V6/6/6

U.S. DEPARTMENT OF ENERGY
VIDEO SWITCHER 4230A1
WIRING DIAGRAM
H-6-14118

Done
K. [unclear]
6/23
5:10 pm

- GENERAL NOTES: (UNLESS OTHERWISE SPECIFIED)
- 1- CABLES SHALL BE IDENTIFIED AT A PLACE OF EASY ACCESS WITH A PERMANENTLY AFFIXED LABEL INDICATING THE CABLE IDENTIFICATION NUMBER, CABLE NUMBER, AND NUMBER OF CABLES IN THE CABLE ASSEMBLY. (SEE 4220A1197, 4220A1197-1)
- 2- IDENTIFY CONNECTORS AS SHOWN WITH THE FULL QUANTITY CONNECTOR NUMBER CONTAINING SYSTEM, CABLE AND CONNECTOR NUMBER. (SEE 4220A1197, 4220A1197-1)
- 3- IDENTIFY EACH END OF CABLE WITH THE IDENTIFICATION OF THE OTHER END OF CABLE.

PARTS/MATERIAL LIST		QTY	UNIT	DESCRIPTION	REVISION	DATE
1	1	1	1	CABLE ASSEMBLY A	1	10/1/78
2	1	1	1	CABLE ASSEMBLY B	1	10/1/78
3	1	1	1	CABLE ASSEMBLY C	1	10/1/78
4	1	1	1	CABLE ASSEMBLY D	1	10/1/78
5	1	1	1	CABLE ASSEMBLY E	1	10/1/78
6	1	1	1	CONNECTOR, 4 PIN, S-WINGED	1	10/1/78
7	1	1	1	CONNECTOR, 4 PIN, S-WINGED	1	10/1/78
8	1	1	1	CONNECTOR, 4 PIN, S-WINGED	1	10/1/78
9	1	1	1	CONNECTOR, 4 PIN, S-WINGED	1	10/1/78
10	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
11	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
12	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
13	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
14	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
15	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
16	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
17	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
18	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
19	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
20	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
21	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
22	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
23	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
24	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
25	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
26	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
27	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
28	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
29	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78
30	1	1	1	CABLE, COAXIAL, RG-59	1	10/1/78

REV 6/16/78

U.S. DEPARTMENT OF ENERGY	REVISIONS	DATE	BY	REASON
VIDEO DISPLAY AND RECORDING SYSTEM CABLE ASSEMBLY	1	10/1/78		
2	6/16/78			
3				
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29				
30				

4

5:10pm

6/16/78

C-35

CABLE ASSEMBLY "A"
(ALL 25 PINS ARE CONNECTED)
4230A341-4230A5

CABLE ASSEMBLY "B"
4230A1J3-4230A5

CABLE ASSEMBLY "C"
(CABLE IS A NAIL ANCHOR TYPE)

CABLE ASSEMBLY "D"

CABLE ASSEMBLY "E"

CABLE ASSEMBLY "F"
(CABLE PROVIDED WITH VARIOUS TYPES)

CABLE ASSEMBLY "G"

REV NO	TITLE	REV NO	TITLE	REV NO	TITLE	REV NO	TITLE	REV NO	TITLE
1	1	2	2	3	3	4	4	5	5

Need to know what day or assemblies this applies to.

like H-6-1A114

Bel

6/16/78

U.S. DEPARTMENT OF ENERGY
I/O SUBSYSTEM
CABLE ASSEMBLY

OVER ALL
STDS SHOULD REF

*BT Williams
(Mechanical)*

Williams
(Mechanical)

38 SUN SHIELD (SIDE)
SCALE: 1/8
10 GA. ALUMINUM

37 SUN SHIELD (DOOR)
SCALE: 1/8
10 GA. ALUMINUM

Dimensions $\pm 1/8$ inch

36 SUN SHIELD (TOP)
SCALE: 1/8
10 GA. ALUMINUM

Brf
6/16/8

Done
6/1/80

REV. NO.	DATE	DESCRIPTION	BY	CHKD.
1	6/1/80	REVISED PER ECH 700008	WJ	WJ
2	6/1/80	REVISIONS	WJ	WJ
3	6/1/80	REVISIONS	WJ	WJ
4	6/1/80	REVISIONS	WJ	WJ
5	6/1/80	REVISIONS	WJ	WJ
6	6/1/80	REVISIONS	WJ	WJ
7	6/1/80	REVISIONS	WJ	WJ
8	6/1/80	REVISIONS	WJ	WJ
9	6/1/80	REVISIONS	WJ	WJ
10	6/1/80	REVISIONS	WJ	WJ

U.S. DEPARTMENT OF ENERGY
NATIONAL BUREAU OF STANDARDS
NBS-6-14125

SUNSHIELD DETAILS

C-40

TEST SHALL BE 3/16" MIN FOR LINE 1
5/32" MIN FOR ALL OTHER LINES
ATX NAMEPLATE WITH APPROVED ANNEAL

(59) NAMEPLATE
SCALE 1/1"

NAMEPLATE SCHEDULE			
ITEM NO	LINE 1	LINE 2	LINE 3
1	MAIN POWER	MAIN POWER	MAIN POWER
2	SHUNT TRIP	SHUNT TRIP	SHUNT TRIP
3	UNDER TRIP	UNDER TRIP	UNDER TRIP
4	OVER TRIP	OVER TRIP	OVER TRIP
5	UNDER TRIP	UNDER TRIP	UNDER TRIP
6	OVER TRIP	OVER TRIP	OVER TRIP
7	UNDER TRIP	UNDER TRIP	UNDER TRIP
8	OVER TRIP	OVER TRIP	OVER TRIP
9	UNDER TRIP	UNDER TRIP	UNDER TRIP
10	OVER TRIP	OVER TRIP	OVER TRIP
11	UNDER TRIP	UNDER TRIP	UNDER TRIP
12	OVER TRIP	OVER TRIP	OVER TRIP
13	UNDER TRIP	UNDER TRIP	UNDER TRIP
14	OVER TRIP	OVER TRIP	OVER TRIP
15	UNDER TRIP	UNDER TRIP	UNDER TRIP
16	OVER TRIP	OVER TRIP	OVER TRIP
17	UNDER TRIP	UNDER TRIP	UNDER TRIP
18	OVER TRIP	OVER TRIP	OVER TRIP
19	UNDER TRIP	UNDER TRIP	UNDER TRIP
20	OVER TRIP	OVER TRIP	OVER TRIP
21	UNDER TRIP	UNDER TRIP	UNDER TRIP
22	OVER TRIP	OVER TRIP	OVER TRIP
23	UNDER TRIP	UNDER TRIP	UNDER TRIP
24	OVER TRIP	OVER TRIP	OVER TRIP
25	UNDER TRIP	UNDER TRIP	UNDER TRIP
26	OVER TRIP	OVER TRIP	OVER TRIP
27	UNDER TRIP	UNDER TRIP	UNDER TRIP
28	OVER TRIP	OVER TRIP	OVER TRIP
29	UNDER TRIP	UNDER TRIP	UNDER TRIP
30	OVER TRIP	OVER TRIP	OVER TRIP

Delete
(will be on
new label
dwg)

TEST SHALL BE 7/32" MIN FOR LINE 1
5/32" MIN FOR ALL OTHER LINES
ATX NAMEPLATE WITH APPROVED ANNEAL

(46) NAMEPLATE
SCALE 1/1"

NAMEPLATE SCHEDULE			
ITEM NO	LINE 1	LINE 2	LINE 3
1	MAIN POWER	MAIN POWER	MAIN POWER
2	SHUNT TRIP	SHUNT TRIP	SHUNT TRIP
3	UNDER TRIP	UNDER TRIP	UNDER TRIP
4	OVER TRIP	OVER TRIP	OVER TRIP
5	UNDER TRIP	UNDER TRIP	UNDER TRIP
6	OVER TRIP	OVER TRIP	OVER TRIP
7	UNDER TRIP	UNDER TRIP	UNDER TRIP
8	OVER TRIP	OVER TRIP	OVER TRIP
9	UNDER TRIP	UNDER TRIP	UNDER TRIP
10	OVER TRIP	OVER TRIP	OVER TRIP
11	UNDER TRIP	UNDER TRIP	UNDER TRIP
12	OVER TRIP	OVER TRIP	OVER TRIP
13	UNDER TRIP	UNDER TRIP	UNDER TRIP
14	OVER TRIP	OVER TRIP	OVER TRIP
15	UNDER TRIP	UNDER TRIP	UNDER TRIP
16	OVER TRIP	OVER TRIP	OVER TRIP
17	UNDER TRIP	UNDER TRIP	UNDER TRIP
18	OVER TRIP	OVER TRIP	OVER TRIP
19	UNDER TRIP	UNDER TRIP	UNDER TRIP
20	OVER TRIP	OVER TRIP	OVER TRIP
21	UNDER TRIP	UNDER TRIP	UNDER TRIP
22	OVER TRIP	OVER TRIP	OVER TRIP
23	UNDER TRIP	UNDER TRIP	UNDER TRIP
24	OVER TRIP	OVER TRIP	OVER TRIP
25	UNDER TRIP	UNDER TRIP	UNDER TRIP
26	OVER TRIP	OVER TRIP	OVER TRIP
27	UNDER TRIP	UNDER TRIP	UNDER TRIP
28	OVER TRIP	OVER TRIP	OVER TRIP
29	UNDER TRIP	UNDER TRIP	UNDER TRIP
30	OVER TRIP	OVER TRIP	OVER TRIP

NOTES:

1. ALL CONTACTS ARE SHOWN DE-ENERGIZED.
2. TO FUNCTIONS TO KEEP HEATERS FROM HEATING AN ALREADY COOLED ENCLOSURE.

Delete
(will be on
new label
dwg)

Blyden
8/10/98

ATIE ELEMENTARY DIAGRAM

U.S. DEPARTMENT OF ENERGY
ATIE
ELEMENTARY DIAGRAM AND
PANELBOARD SCHEDULE
F 6000 7302 H-6-141261
DATE: 8/10/98
DRAWN BY: BLYDEN
CHECKED BY: [blank]
SCALE: 1/1"

REVISIONS
NO. 1 REVISED PER EEN 700100 12/96
DATE: 12/96
BY: [blank]
REASON: [blank]
DRAWING TRACKABILITY LIST
NEXT USED ON: H-6-14125

Power Aφ

1 Wire CB13 connects to breaker CB15.

2 Wire CB2 connects to breaker CB9.

BRJ/ps
8/10/98

ATIE WIRING DIAGRAM

U.S. DEPARTMENT OF ENERGY Washington, D.C. 20545	
ATIE POWER AND CONTROL WIRING DIAGRAM	
DATE: 8/10/98	BY: BRJ/ps
REVISION: 1	REVISION: 1
PROJECT: H-6-14126	PROJECT: H-6-14126
WORK ORDER: 61235	WORK ORDER: 61235
ISSUED: 8/10/98	ISSUED: 8/10/98
BY: BRJ/ps	BY: BRJ/ps
CHECKED: 8/10/98	CHECKED: 8/10/98
BY: [Signature]	BY: [Signature]

U.S. DEPARTMENT OF ENERGY Washington, D.C. 20545	
ATIE POWER AND CONTROL WIRING DIAGRAM	
DATE: 8/10/98	BY: BRJ/ps
REVISION: 1	REVISION: 1
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BY: BRJ/ps	BY: BRJ/ps
CHECKED: 8/10/98	CHECKED: 8/10/98
BY: [Signature]	BY: [Signature]

AT-TANK INSTR ENCL / 4300A1, 4300A2 & 4300A3

ATE INTERCONNECTION DIAGRAM
 TERMINATED ON
 VARIOUS END
 EFFECTOR
 CONTROLLERS
 PER OPERATING
 PROCEDURES TO
 SUPPORT THE
 END EFFECTOR
 CORRENTLY
 IN USE.

#1

6510 A1

#3

ATTACHED TO H-6-14131 Sheet 1

ATIE RS-485 INTERCONNECTION DIAGRAM

8/10/88

FOR GENERAL NOTES SEE SHEET 1

U.S. DEPARTMENT OF ENERGY	
AT-TANK INSTR ENCL	
INTERCONNECTION DIAGRAM	
H-6-14131	
REV. 2	
DATE: 8/10/88	
BY: [Signature]	
CHECKED: [Signature]	
APPROVED: [Signature]	
TITLE: INTERCONNECTION DIAGRAM	
DRAWING TRACKING LIST	
REV. NO. TITLE	
REV. 1 INTERCONNECTION DIAGRAM	
REV. 2 INTERCONNECTION DIAGRAM	
REV. 3 INTERCONNECTION DIAGRAM	
REV. 4 INTERCONNECTION DIAGRAM	
REV. 5 INTERCONNECTION DIAGRAM	
REV. 6 INTERCONNECTION DIAGRAM	
REV. 7 INTERCONNECTION DIAGRAM	
REV. 8 INTERCONNECTION DIAGRAM	
REV. 9 INTERCONNECTION DIAGRAM	
REV. 10 INTERCONNECTION DIAGRAM	
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REV. 96 INTERCONNECTION DIAGRAM	
REV. 97 INTERCONNECTION DIAGRAM	
REV. 98 INTERCONNECTION DIAGRAM	
REV. 99 INTERCONNECTION DIAGRAM	
REV. 100 INTERCONNECTION DIAGRAM

OPTO-22 DRAWER #1 / 4220A2

DRAWER BOTTOM

LEFT SIDE PANEL

GENERAL NOTES:

1. ALL WIRING TO BE SHIELDED TWISTED PAIR #20 OR #22 AWG.
2. CONNECTOR PINS FOLLOWED BY "A" INDICATE LOWER CASE.
3. ON CONNECTORS 4220A2, SHIELDS ARE TERMINATED ON PINS M, B, Z, X, W, V, U & T.
4. ON CONNECTOR 4220A2, SHIELDS ARE TERMINATED ON PINS L, I, N, K, X, M, B, Z, U, V, W, T, Y, & S.
5. MODULES EXCEPT 16 CHANNEL DIGITAL UNIT TO BE OPTO-22 CHANNEL 9 MODULE IS BARRIER #5-WT5-C W/INTERIOR DIET.
6. ON DIGITAL I/O BOARD ALL "X" TERMINALS ARE CONNECTED FOR USE AS FIELD POWER SUPPLY, ARE CONNECTED TO BOARD.

6/8/88

Done
10/25/84

U.S. DEPARTMENT OF ENERGY
ATIE
OPTO-22 DRAWER NO.1
WIRING DIAG

U.S. DEPARTMENT OF ENERGY
ATIE
OPTO-22 DRAWER NO.1
WIRING DIAG

U.S. DEPARTMENT OF ENERGY
ATIE
OPTO-22 DRAWER NO.1
WIRING DIAG

U.S. DEPARTMENT OF ENERGY
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WIRING DIAG

U.S. DEPARTMENT OF ENERGY
ATIE
OPTO-22 DRAWER NO.1
WIRING DIAG

GENERAL NOTES:

ALL WIRING TO BE SHIELDED TWISTED PAIR, #20 OR #22 AWG.

U.S. GOVERNMENT PRINTING OFFICE: 1975 O 290-000	
INTERLOCK JUNCTION DRAWER	
WIRING DIAG	
H-6-14134	
S	

GENERAL NOTES:

1. ALL WIRING TO BE SHIELDED TWISTED PAIR, #20 OR #22 AWG.

INTERLOCK JUNCTION PANEL WIRING DIAGRAM

4300A1251 CONTROL SEQUENCE			
POS	LABEL	1-2	3-4
1	N/A	0	0
2	NORMAL	X	0
3	BYPASS	0	X

ALL WIRING STP, 20 OR 22 AWG

INTERLOCK JUNCTION PANEL

Ride & Valve
Switch Power

Power
PLUG

FORM NO. 10-75 (Rev. 10-75)		U.S. DEPARTMENT OF ENERGY	
OFFICE OF NUCLEAR ENERGY		OFFICE OF NUCLEAR ENERGY	
WASHINGTON, D.C. 20545		WASHINGTON, D.C. 20545	
DATE: 10/1/75		DATE: 10/1/75	
BY: J. B. B. / J. B. B.		BY: J. B. B. / J. B. B.	
TITLE: INTERLOCK JUNCTION DRAWER		TITLE: INTERLOCK JUNCTION DRAWER	
WIRING DIAG		WIRING DIAG	
PROJECT NO: 100-6-14134		PROJECT NO: 100-6-14134	
DRAWING NO: 100-6-14134-1		DRAWING NO: 100-6-14134-1	
REVISIONS:		REVISIONS:	
1. 100-6-14134-1		1. 100-6-14134-1	
2. 100-6-14134-2		2. 100-6-14134-2	
3. 100-6-14134-3		3. 100-6-14134-3	
4. 100-6-14134-4		4. 100-6-14134-4	
5. 100-6-14134-5		5. 100-6-14134-5	
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Re: Question
446261

does not exist
Replaced by air
hose.

(UNLESS OTHERWISE SPECIFIED)

1. CABLE SEGMENTS SHALL BE IDENTIFIED AT EACH END INCLUDING CABLE NUMBER AND CONNECTOR NUMBER.
- 2.
3. CONNECTOR PINS FOLLOWED BY "/>" INDICATE LOWER CASE LETTERS. FOR EXAMPLE, PIN A/1 IS Labeled 0 OR 1 ON THE CONNECTOR.
4. FIELD TO DETERMINE INDIVIDUAL CONNECTED COLOR/CONNECTOR PIN ASSIGMENTS SHALL BE OBTAINED AFTER THE ASSEMBLY OF EACH CABLE.
5. REMOVE TEST CUPS FROM PATCH CABLE. SOLDER HEAT CABLE LEADS TO SIP WIRING AS SHOWN. COVER SOLDER CONNECTIONS WITH HEAT-SHINKABLE TUBING.

PARTS/MATERIAL LIST		MANUFACTURE/DESCRIPTION	MATERIAL/REFERENCE	QTY
1	010	CABLE ASSEMBLY "A"	BRONX	1
2	020	CABLE ASSEMBLY "C"	BRONX	2
3	030	CABLE ASSEMBLY "C"	BRONX	3
4	040	CABLE ASSEMBLY "C"	BRONX	4
5	050			5
6	060			6
7	070			7
8	080			8
9	090			9
10	100	CABLE ASSEMBLY "A"	BRONX	10
11	110	CABLE ASSEMBLY "A"	BRONX	11
12	120	CABLE ASSEMBLY "C"	BRONX	12
13	130	CABLE ASSEMBLY "C"	BRONX	13
14	140	CABLE ASSEMBLY "A"	BRONX	14
15	150	CABLE ASSEMBLY "A"	BRONX	15
16	160	CABLE ASSEMBLY "C"	BRONX	16
17	170	CABLE ASSEMBLY "A"	BRONX	17
18	180	CABLE ASSEMBLY "C"	BRONX	18
19				19
20		CABLE, CONNECTOR, 50 OHM, RG-74	BRONX	20
21		CABLE, CONNECTOR, 75 OHM, RG-75	BRONX	21
22		RF SHIELD, 1/2" DIA, 1/4" THICK, W/SHIELD	BRONX	22
23		CABLE, 22MM, 1/4" SHIELDED Pairs	BRONX	23
24		CABLE, 22MM, 1/4" SHIELDED Pairs	BRONX	24
25		CABLE, 22MM, 1/4" SHIELDED Pairs	BRONX	25
26		WIRE, 100-1/2" 22 AWG	BRONX	26
27			BRONX	27
28		CONNECTOR, WALL MOUNTED,	BRONX	28
29		CONNECTOR, WALL MOUNTED,	BRONX	29
30		CONNECTOR, WALL MOUNTED,	BRONX	30
31		CONNECTOR, WALL MOUNTED,	BRONX	31
32		CONNECTOR, WALL MOUNTED,	BRONX	32
33		CONNECTOR, STAKEIT, WALL, 8 PIN	BRONX	33
34		CONNECTOR, STAKEIT, WALL, 8 PIN	BRONX	34
35		CONNECTOR, STAKEIT, 4 PIN	BRONX	35
36		CONNECTOR, STAKEIT, 4 PIN	BRONX	36
37		CONNECTOR, STAKEIT, 4 PIN	BRONX	37
38		CONNECTOR, STAKEIT, 4 PIN	BRONX	38
39		CONNECTOR, STAKEIT, 4 PIN	BRONX	39
40		CONNECTOR, STAKEIT, 4 PIN	BRONX	40

PARTS/MATERIAL LIST CONTINUED ON SH. NO. 2

MS3126F12-85X

Bd 4/8/98

[illegible]

DEC 17 1996
STATE OF TEXAS
COUNTY OF DALLAS
56

Done
Ken
6/25/68

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6/8/98

[illegible]

FOR GENERAL NOTES, PARTS LIST AND
REFERENCE DRAWINGS, SEE SHEET 1

BRF 6/8/98

Handwritten signature

U.S. DEPARTMENT OF ENERGY
AT-TANK INSTR ENCLOSURE S
(ATIE)
INTERNAL CABLE ASSY'S
H-6-14135

REV	NO	DATE	BY	CHKD	APP'D	DESCRIPTION
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KEYPAD TO RECEIVER

RECEIVER TO PAN AND TILT

RECEIVER TO LENS

QTY FIELD						PART/DSN NUMBER		NOMENCLATURE/DESCRIPTION		NATIONAL REFERENCE		ITEM NO.
-255	-260	-265	-270	-280	-285							
								CABLE ASSEMBLY, KEYPAD TO 4100A30AA5	8200H1			1
								CABLE ASSEMBLY, TO RECEIVER INTERFACE	8200H4			2
								CABLE ASSEMBLY, RECEIVER TO VPS BOARD				3
								CABLE ASSEMBLY, RECEIVER TO PAN AND TLT	8200W10			4
								CABLE ASSEMBLY, RECEIVER TO LENS	SEE NOTE 3			5
								CABLE ASSEMBLY, COAX, SEE NOTE 1	8200W2 8200W3			6
								CABLE ASSEMBLY, COAX, SEE NOTE 2	8200W5, WB 8200W6, WB			7
												8
							82241	RG-59/U COAX, PLENUM RATED	BELDEN			9
							8212	RG-59/U COAX	BELDEN			10
							87723	CABLE, DUAL, SHIELDED, TP	BELDEN			11
							87788	CABLE, DUAL, SHIELDED, TP	BELDEN			12
							84383	CABLE, DUAL, SHIELDED, TP	BELDEN			13
							19402	POWER SUPPLY CABLE,	BELDEN			14
							8537	CABLE, 7-COND SHIELDED	BELDEN			15
							8448	CABLE, 15-COND	BELDEN			16
							1625-9RP	CONNECTOR, MALE 9 PIN, NYLON SHELL	MOLEX			17
							29-2100	CONNECTOR, B N C	AM			18
							97-3108-A-20-7-F	CONNECTOR	AMPHENOL			19
							97-3102-A-20-7-F	CONNECTOR	AMPHENOL			20
							97-3106-20-7-S	CONNECTOR	AMPHENOL			21
							97-3102-A-20-7-F	CONNECTOR	AMPHENOL			22
							1625-9RR	CONNECTOR, FEMALE, 9 JACKS, NYLON SHELL	MOLEX			23
							MOON M# VC2820A-2	CAMERA	8200AA			24
							MOON M# FV16-160	LENS	8200AA			25
							MOON M# V800HC	HOUSING	8200AA			26
							V330APT					27
							MOON M#V300M	PAN & TLT	8200A5			28
							MOON V1310B	RECEIVER MAIN PC BOARD	8200A2			29
							MOON V1310R VPS	RECEIVER INTERFACE BOARD	8200A2			30
							MOON V1300A-RVC	KEYPAD CONTROLLER	8200A1			31
												32
							CUSTOM	INTERFACE PANEL	4100A30AA			33
							VIDEO SWITCHER	Cityman Security	4230A1			34

Add #15 to Dwg
Correct P/N's
Eliminate P/N# 12+13

NOTES:

1. CABLE ASSEMBLY 6 IS MADE FROM COAX RG-59/U, ITEM 10.
2. CABLE ASSEMBLY 7 IS MADE FROM COAX RG-59/U, PLENUM RATED ITEM 9.
3. THIS CABLE IS SUPPLIED BY THE LENS VENDOR.

BRJ 6/16/98

X. Qw
6/23
5:40pm

4

WIRING DIAGRAM

BRJ
6/16/88
Note: LABELS
in (C) are not
physically found in
field.

DATE	BY	REVISION	DESCRIPTION
10/11/88	BRJ	1	INITIAL DESIGN
10/11/88	BRJ	2	REVISION
10/11/88	BRJ	3	REVISION
10/11/88	BRJ	4	REVISION
10/11/88	BRJ	5	REVISION
10/11/88	BRJ	6	REVISION
10/11/88	BRJ	7	REVISION
10/11/88	BRJ	8	REVISION
10/11/88	BRJ	9	REVISION
10/11/88	BRJ	10	REVISION

U.S. DEPARTMENT OF ENERGY
FLUOR DENERG CORP.
OPERATIONS OVERVIEW
A VIDEO CAMERA SYSTEM
LAYOUT WIRING DIAGRAM

4.
K. D. 6/23/88
C-56

1 CABLE 3340W1 ASSEMBLY
(OVER SHIELD CABLE)
CABLE LENGTH 50'
CABLE LENGTH 50'

3 CABLE 4300W1 ASSEMBLY
(I.D.U.A. INTERLOCK CABLE)
(SEE NOTE 3)
CABLE LENGTH 50'

4 CABLE 3520W1 ASSEMBLY
(FREQUENCY WARNING RECTIFIER CABLE)
CABLE LENGTH 50'

2 CABLE 3360W1 ASSEMBLY
(RESER INTERLOCK CABLE)
CABLE LENGTH 50'

PARTS/MATERIAL LIST				QTY	UNIT
QTY	REF DES	PART/DESCRIPTION	QTY	UNIT	REMARKS
1	-010	CABLE 3340W1 ASSEMBLY	1	EA	
2	-020	CABLE 3360W1 ASSEMBLY	2	EA	
3	-030	CABLE 4300W1 ASSEMBLY	3	EA	
4	-040	CABLE 3520W1 ASSEMBLY	4	EA	
5	-050	CABLE 2000W1 ASSEMBLY	5	EA	
6	-060	CABLE 2000W2 ASSEMBLY	6	EA	
7	-070	CABLE 2000W3 ASSEMBLY	7	EA	
8	-080	CABLE 2000W4 ASSEMBLY	8	EA	
9	-090	CABLE 2000W5 ASSEMBLY	9	EA	
10	-100	CABLE 2000W6 ASSEMBLY	10	EA	
11	-110	CABLE 2000W7 ASSEMBLY	11	EA	
12	-120	CABLE 2000W8 ASSEMBLY	12	EA	
13	-130	CABLE 2000W9 ASSEMBLY	13	EA	
14	-140	CABLE 2000W10 ASSEMBLY	14	EA	
15	-150	CABLE 2000W11 ASSEMBLY	15	EA	
16	-160	CABLE 2000W12 ASSEMBLY	16	EA	
17	-170	CABLE 2000W13 ASSEMBLY	17	EA	
18	-180	CABLE 2000W14 ASSEMBLY	18	EA	
19	-190	CABLE 2000W15 ASSEMBLY	19	EA	
20	-200	CABLE 2000W16 ASSEMBLY	20	EA	
21	-210	CABLE 2000W17 ASSEMBLY	21	EA	
22	-220	CABLE 2000W18 ASSEMBLY	22	EA	
23	-230	CABLE 2000W19 ASSEMBLY	23	EA	
24	-240	CABLE 2000W20 ASSEMBLY	24	EA	
25	-250	CABLE 2000W21 ASSEMBLY	25	EA	
26	-260	CABLE 2000W22 ASSEMBLY	26	EA	
27	-270	CABLE 2000W23 ASSEMBLY	27	EA	
28	-280	CABLE 2000W24 ASSEMBLY	28	EA	
29	-290	CABLE 2000W25 ASSEMBLY	29	EA	
30	-300	CABLE 2000W26 ASSEMBLY	30	EA	
31	-310	CABLE 2000W27 ASSEMBLY	31	EA	
32	-320	CABLE 2000W28 ASSEMBLY	32	EA	
33	-330	CABLE 2000W29 ASSEMBLY	33	EA	
34	-340	CABLE 2000W30 ASSEMBLY	34	EA	
35	-350	CABLE 2000W31 ASSEMBLY	35	EA	

GENERAL NOTES: (UNLESS OTHERWISE SPECIFIED)

1. CABLE ENDING SHALL BE IDENTIFIED AT EACH END WITH A WIREMAN-RESISTANT LABEL INCLUDING CABLE NUMBER.
2. NUMBER FOR IDENTIFICATION, BY "X" UNLESS LONGER CASE LETTERS.
3. FOR EXAMPLE: PAV Y IS USED ON 4 OR 5 ON THE CONNECTOR.
4. FIELD TO DETERMINE INDIVIDUAL CONDUCTOR COLOR/CONNECTOR PIN ASSIGNMENTS AS REQUIRED. A PIN/ASSIGNMENT CHECK (PER THE APPLICABLE ASSEMBLY) SHALL BE PERFORMED AFTER THE ASSEMBLY CHECK.
5. AND "1" EXTENDED CABLE ENDING SHALL BE IDENTIFIED AS EXTENDED 75-ohm COAX OPEN CONDUCTOR END 75-ohm COAX.

ECN 646-261

6/5/98

Changed for 201
ECN

COMMON VIDEO END
EFFECTOR (CVEE)
(REF)

OPTICAL ALIGNMENT SCOPE
(OAS)

Not hooked up to verify

BoB
6/11/98

8. 2" 15V 150W
Gerson-Sylvania Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

4. 4" 150W 150W
Lamp # 354811/20/ARL

REV	DATE	DESCRIPTION	BY	CHK
1		ISSUED FOR FAB

- NOTES:
1. DRAWING IS APPROXIMATELY TO SCALE
 2. THE CHASSIS SHOULD BE ON FULL-OUT ROLLERS FOR EASY ACCESS TO OPTO MODULES.
 3. Dimensions reference only

REV	DATE	TITLE	BY	CHK
1		COMMON VIDEO END EFFECTOR (ONE) CHASSIS LAYOUT		

U.S. DEPARTMENT OF ENERGY
Nuclear Energy Research Center
General Atomics Division

COMMON VIDEO END EFFECTOR (ONE) CHASSIS LAYOUT

DATE: 6/11/98

BY: [Signature]

CHK: [Signature]

1000 0 6002 H-6-14270 0

Is this the letter Q? or am I?
 Answer: Lower case 'q' per BOST
 7/16/98

DATE	10/20/93	BY	702319
U.S. DEPARTMENT OF ENERGY			
Washington Technical Center			
CVEE CHASSIS WIRING DIAGRAM			
PART A			
REV	NO	DATE	BY
1	0001	11-6-14270	0

2.7024
 So far
 Done!
 Check
 7/1
 KIDOK
 Need
 Walkdown
 6/30
 To Bruce
 C-67

PARTS LIST		
QTY	DESCRIPTION	WIRING/TERMINAL

Top '+' jumpers to bottom '-'
Top 'FG' jumpers to bottom 'FG'

BRJ
6/11/98

REV	DATE	DESCRIPTION	BY	CHKD	APP'D	REVISIONS	DATE	DESCRIPTION	BY	CHKD	APP'D

OWN NO	TITLE	REF NUMBER	REFERENCES	EDUCATION	REV	DATE	DESCRIPTION	BY	CHKD	APP'D

DATE	200 G	6502	H-6-14270	REV	0
DATE	200 G	6502	H-6-14270	REV	0

DATE	200 G	6502	H-6-14270	REV	0
DATE	200 G	6502	H-6-14270	REV	0

6/26/98
2
6

NOTES:

1. SHIELDS DAISY-CHAIN AS SHOWN, THEN CONNECT TO EARTH GROUND AT ONE POINT ONLY.
2. THE LAST OPTO RACK IN THE CHAIN WILL HAVE NO CONNECTION TO TERMINALS +TO, -TO, +FO, AND -FO. PROPER TERMINATION IS PROVIDED BY CONFIGURATION JUMPERS ON THE BRAIN BOARD.
3. DO NOT CONNECT ANY COMMON (COM) POINT TO EARTH GROUND. THE GND TERMINAL ON THE IC-485SI CONVERTER IS FLOATING.
4. TWO SWITCHES ON THE IC-485SI SHOULD BE SET TO THE T-ON R-ON, AND DCE STATES.

[illegible]

[illegible]

6/11/98

REV	DATE	DESCRIPTION	APPROVED
1

BRJ
6/11/98
(Change wire routing as shown to reflect field)

U.S. DEPARTMENT OF ENERGY
WATERPOWERS & POWER DIVISION
WIRING DIAGRAM
H-6-14271

REV	DATE	DESCRIPTION	APPROVED
1			

2
C-71
4/16/98
Sue

PARTS LIST		
QTY	DESCRIPTION	WTRN/NOTES

U.S. DEPARTMENT OF ENERGY Regional Operations Office Washington, National Company	
WHC POWER CHASSIS SCHEMATIC (CVEE)	
REV NO F	REV NO 5908
REV NO H-6-14271	REV NO 0
DATE FOR MANUFACTURE NONE	
DATE FOR MANUFACTURE 10/31/88	

BRJ
6/11/88

6/26
5/8

2
C-72

REV	NO	DATE	DESCRIPTION
1	1	10/23/79	ISSUED FOR FABRICATION
2	2	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
3	3	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
4	4	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
5	5	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
6	6	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
7	7	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
8	8	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
9	9	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
10	10	11/14/79	REVISED TO ADD 1/8" THICK FLANGE

REV	NO	DATE	DESCRIPTION
1	1	10/23/79	ISSUED FOR FABRICATION
2	2	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
3	3	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
4	4	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
5	5	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
6	6	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
7	7	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
8	8	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
9	9	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
10	10	11/14/79	REVISED TO ADD 1/8" THICK FLANGE

REV	NO	DATE	DESCRIPTION
1	1	10/23/79	ISSUED FOR FABRICATION
2	2	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
3	3	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
4	4	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
5	5	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
6	6	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
7	7	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
8	8	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
9	9	11/14/79	REVISED TO ADD 1/8" THICK FLANGE
10	10	11/14/79	REVISED TO ADD 1/8" THICK FLANGE

QTY P/N	DESCRIPTION	MATERIAL	ITEM
2	BRACKET	ANY GRADE 300 SST	15
1	DIAMOND PLATE 1/4 THK	ALUMINUM	16
1	STRAP 116A. X 1"	ANY GRADE 300 SST	17
1	UNISTRUT THE THIN STUFF 5/8 5/8 X 5/8	ANY WHATEVER	18
4	FLT. HD. SLT. DISK SCREWS 1" L. DETERMINE SIZE FROM 5/8" HEAD	ANY GRADE SST	19
4	NYLOC NUTS SAME SIZE AS ABOVE	ANY GRADE SST	20
2	1/4-20 UNC-2B FLT HD SLT. DISK X 1" L	ANY " "	21
2	NYLOC NUTS 1/4-20 " " "	" " "	22

NOTES: 12/6
1. EXPOSE TOP STUD TO 1/2\"/>
2. ALTERNATE USING OTHER STUDS TO THE VALVE.
3. INSERT 2 LONG STUDS (ITEM 13) IN LOWER PLATE, 90° APART.
4. INSERT REMAINING 10 STUDS IN HOLES ON LOWER PLATE.
5. INSERT SHORT STUDS (ITEM 14) IN THE HOLES ON UPPER PLATE.
6. BOTTOM OPPOSITE HAND

LOOK ON BACK

14" VEALD BOUNNETED KNIFE GATE VALVE (OR EQUIVALENT)
PN ~~14~~ 119-0320B-13B
NOT PHANTOM

1 RISER ISOLATION VALVE ASSY

QTY	DESCRIPTION	REF. NO.	REV.	DATE
1	14" RISER ISOLATION VALVE ASSY	1	1	12/6/98

DO NOT DIM. EXISTING

DETAIL PN 15

13.25
 -4.50
 8.75
 2.5
 1.25
 7.5
 3

PARTS LIST				MATERIAL LIST	
QTY REQD		PART/DATE NUMBER	DESCRIPTION	MATERIAL/REFERENCE	QTY REQD
-500	-1000	-1500	-2000	-2500	-3000
			H-4-109258 PT NO. 9	HOSE CLAMP SN-101-5	WING SUPPLIED 2,4
			H-4-109258 PT NO. 10	HOSE CLAMP PAD SN-101-7	WING SUPPLIED 2,4
			H-4-109258 PT NO. 11	O-RING SN-101-6	WING SUPPLIED 2,4
			NORTH	RUBBER GLOVES	WING SUPPLIED 2,4
			H-4-109260 ITEM NUMBER 19	PORT COVER SN-101-3	WING SUPPLIED 2,4
			SS-8-NRCG-4	1/2 TO 1/4 HEX REDUCING COUPLING, SST	CAJON 6
			SS-OCB-D-BPM	1/2 MALE NPT SWAGelok STEM, VALVED, SST	SWAGelok 8
			SS-OC4-B-4PMB	1/4 MALE NPT SWAGelok BODY, UNVALVED, SST	SWAGelok 8
			SS-OC4-S-4PF	1/2 FEMALE NPT SWAGelok STEM, UNVALVED, SST	SWAGelok 8
			5279K63	1/4 NPT HOSE, 7 FT LONG	McMASTER-CARR 8
			PW4000AS	GUNJET SPRAYGUN, 1/4 INCH INLET AND OUTLET	SPRAYCO 8
			1/4-MEG-15-11	SST 1/4 MEG NOZZLE	SPRAYCO 8
			SS-OC6-S-6HC	3/8 HOSE CONNECTOR STEM, UNVALVED, SST	SWAGelok 8
			SS-OC6-B-6PM	3/8 MALE NPT SWAGelok BODY, VALVED, SST	SWAGelok 8
			D/P GAGE BRACKET	ASTM A240 SST TYPE 304L	5
			2320-LT	MAGNEHELIC DIFF. PRESS. GAGE, ±10 INCHES WG	DWYER 4
			2302-LT	MAGNEHELIC DIFF. PRESS. GAGE, ±1 INCHES WG	DWYER 4
			SS-400-1-2	1/4 SWAGelok TO 1/8 NPT REDUCER, SST	SWAGelok 4
			SS-43W4-S4-A	1/4 SWAGelok TO 1/4 NPT ANGLED BALL VALVE, SST	SWAGelok 4,8
			AR	1/4 INCH TUBING	ASTM A240 SST TYPE 304L
			SS-400-3	1/4 SWAGelok UNION TEE SST	SWAGelok 4
			324-SS	PULL ACTION MANU. CLAMP	DE-STA-CO 2,4
			30.5"	ANGLE, 2x2x1/8 THICK	ASTM A240 SST TYPE 304L
			#10-24UNC SOCKET HEAD CAP SCREW, BLACK OXIDE FINISH	COMM'L GRADE	2,4
			WING NUT, .250-20 UNC-28	18-8 SST	2
			5X13 UNC-2A	18-8 SST	2
			X1.75 BOLT	SST 3/16	3
			EYELET		
			FOR SUPPORT		
			OF CONTAMINATION		
			CURTAIN		
			FASTENERS		

[illegible]

GENERAL NOTES :

1. DIMENSIONING AND TOLERANCING PER AWS Y14.5M, (B2). DIMENSIONS ARE IN INCHES. TOLERANCE ON DECIMALS : $X = \pm .1$, $X = \pm .03$, $X = \pm .005$, ANGLES $\pm 1^\circ$.
~~DIMENSIONING AND TOLERANCING IN FRACTIONS ARE GENERAL DIMENSIONS~~
2. BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
3. MACHINED SURFACE TO BE ¹²⁵ ~~VOR~~ BETTER
4. ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH HANFORD STANDARD HS-V-3-0013.
"WELDING OF STAINLESS STEEL AND NICKEL ALLOY
STRUCTURAL AND OTHER COMPONENTS"
REVISION "A", 10/19/92.
5. LOCTITE ALL SCREWS AT ASSEMBLY, EXCEPT WHERE LOCK NUTS ARE USED.
6. MOUNTING FLANGE TO BE USED WHEN TRIC ENCLOSURE ASSEMBLY IS IN TRANSIT. CR. 5106AG

→ GLOWE PORT MAY BE
~~CONFIRMED BE SET~~
UP TO
CONFIGURED WITH
DIFFERENT
HARDWARE
PROVIDED
PROPER SEAL
IS MAINTAINED

*3 1/2" Reach
modified with
longer clamp
ring*

MODIFY DE-ST-A-CO CLAMP TO PROVIDE
3 3/4" REACH. WELD AS REQUIRED.

FIELD LOCATE DESTACO CLAMPS TO PROVIDE
ADDITIONAL COMPRESSION OF ENCLOSURE DOOR

DWG NO		TITLE		REF NUMBER	TITLE		YES	NO	DESCRIPTION	REVISIONS		DATE	BY	DATE	BY	DATE	BY	DATE	BY
DRAWING TRACEABILITY LIST		NEXT USED ON			REFERENCES				CADFILE	F014304A	CADCODE	DGS-6.22-ADD-12.0							

DEC 17 1996
DATE
ETA
#3
56

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
WESTINGHOUSE HANFORD COMPANY
TRIC ENCLOSURE
ASSEMBLY

200GEN	4750	H-6-14304
SCALE	SHOWN	702319

8
1/2" x 1/2" x 1/2"

INTERNAL
EYE BOLTS
SHOWN ON
DWG H-6-14304, 542

PN 65 MAY BE
SUBSTITUTED FOR
PN 18 WHEN USING
PN 36

SEE NOTE 6
36

SEE NOTE 6
36

VIEW B-B
(SEE SHEET 2)

OK DELETE
internal eye bolts

4 Dia. x .5

SMALL SEAL USED
ALL AROUND VIEW 17 AND 30

SEALED ALL AROUND
VIEW 17 AND 30

Door Assy NOT
shown on H-6-14304
on another drawing
Door is part of
Hoffman
enclosure
Door closure
Hoffman
enclosure

FILTER ASSY

ON PARTS
LIST MAKE
ASSY 2
CONSISTING
OF ITEMS
17-30

SECTION E-E
SCALE 1/2"

REF
REF
REF

SEE SHEET 1 FOR NOTES

U.S. DEPARTMENT OF ENERGY
RESISTOR ENCLOSURE
ASSEMBLY

REV NO	TITLE	REV NUMBER	REV DATE	REV BY	REV FOR
1	ENCLOSURE	1	10/1/70	...	...
2	ENCLOSURE	2	10/1/70	...	...
3	ENCLOSURE	3	10/1/70	...	...

SEE SHEET 1 FOR NOTES

U.S. DEPARTMENT OF ENERGY
NATIONAL BUREAU OF STANDARDS
TRIC ENCLOSURE ASSEMBLY

REV NO	DATE	BY	CHKD	REV NO	DATE	BY	CHKD
1				1			
2				2			
3				3			
4				4			
5				5			

2. PLAT SCALE: 1"=1"

GENERAL NOTES :

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M (2018). DIMENSIONS ARE IN INCHES.
TOLERANCE ON DECIMALS: .X = ±.010, .XX = ±.005, .XXX = ±.005, ANGLES ±1°.
2. BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
3. MACHINED SURFACE TO BE 125/
4. ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH
AMERICAN WELDING STANDARD AWS D1.2 FOR WELDING OF ALUMINUM.
5. LOCTITE ALL SCREWS AT ASSEMBLY.

FIELD LOCATE HOLES
APPROXIMATELY AS SHOWN

USE PLASTIC
COATED CABLE
SECURE TO ITEM 39
USING APPROPRIATE
HARDWARE

8. Some of the information
etc :- .. .

BRACE, END
SCALE 1/1

SEE SHEET 1 FOR NOTES

U.S. DEPARTMENT OF ENERGY
Nuclear Energy Research Administration
HANDLING SYSTEM
RAILS

DATE	TITLE	REV.	BY	CHKD.	APP'D.
10/15/68	END EFFECTOR HANDLING SYSTEM RAILS	1	J. S. GAYMAN		
10/15/68		2	J. S. GAYMAN		
10/15/68		3	J. S. GAYMAN		
10/15/68		4	J. S. GAYMAN		
10/15/68		5	J. S. GAYMAN		
10/15/68		6	J. S. GAYMAN		
10/15/68		7	J. S. GAYMAN		
10/15/68		8	J. S. GAYMAN		
10/15/68		9	J. S. GAYMAN		
10/15/68		10	J. S. GAYMAN

$$\begin{array}{r} 5 \\ 28.75 \\ \hline \end{array}$$

~~28.375~~
~~4.11~~
20.75

(Match Holes
match Item 6

DEC 17 1996
DATE
#3
MAINTENANCE
RECALLS
56

C-92

- GENERAL NOTES :
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M (92). DIMENSIONS ARE IN INCHES. TOLERANCE ON DECIMALS : X = $\pm .1$, XX = ± 0.01 , XXX = ± 0.005 , ANGLES $\pm 1^\circ$. DIMENSIONING AND TOLERANCING IN FRACTIONS ARE GOVERNED BY DIMENSIONS.
 2. BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
 3. MACHINED SURFACE TO BE 125° .
 4. ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH AMERICAN WELDING STANDARD AWS D1.2 FOR WELDING OF ALUMINUM.
 5. LOCITE ALL SCREWS AT ASSEMBLY.

(END EFFECTOR HANDLING SYSTEM PAULS H-6-14306)

REV NO.	TITLE	REV NUMBER	DATE
1	INITIAL	1	10/23/92
2	REVISIONS		
3	REVISIONS		
4	REVISIONS		
5	REVISIONS		

PARTS LIST/MATERIAL LIST		QTY	DESCRIPTION	UNIT	QTY
1	ASSEMBLY	1			
2	FRAME, CART	2	ALUMINUM		
3	WASHER	1	18-8 SST		
4	SCREW, SOC. HD. CAP	1	18-8 SST		
5	SCREW, SOC. HD. CAP	1	18-8 SST		
6	SCREW, SOC. HD. CAP	1	18-8 SST		
7	SCREW, SOC. HD. CAP	1	18-8 SST		
8	SCREW, SOC. HD. CAP	1	18-8 SST		
9	SCREW, SOC. HD. CAP	1	18-8 SST		
10	SCREW, SOC. HD. CAP	1	18-8 SST		
11	SCREW, SOC. HD. CAP	1	18-8 SST		
12	SCREW, SOC. HD. CAP	1	18-8 SST		
13	SCREW, SOC. HD. CAP	1	18-8 SST		
14	SCREW, SOC. HD. CAP	1	18-8 SST		
15	SCREW, SOC. HD. CAP	1	18-8 SST		
16	SCREW, SOC. HD. CAP	1	18-8 SST		
17	SCREW, SOC. HD. CAP	1	18-8 SST		
18	SCREW, SOC. HD. CAP	1	18-8 SST		
19	SCREW, SOC. HD. CAP	1	18-8 SST		
20	SCREW, SOC. HD. CAP	1	18-8 SST		
21	SCREW, SOC. HD. CAP	1	18-8 SST		
22	SCREW, SOC. HD. CAP	1	18-8 SST		
23	SCREW, SOC. HD. CAP	1	18-8 SST		
24	SCREW, SOC. HD. CAP	1	18-8 SST		
25	SCREW, SOC. HD. CAP	1	18-8 SST		
26	SCREW, SOC. HD. CAP	1	18-8 SST		
27	SCREW, SOC. HD. CAP	1	18-8 SST		
28	SCREW, SOC. HD. CAP	1	18-8 SST		
29	SCREW, SOC. HD. CAP	1	18-8 SST		
30	SCREW, SOC. HD. CAP	1	18-8 SST		
31	SCREW, SOC. HD. CAP	1	18-8 SST		
32	SCREW, SOC. HD. CAP	1	18-8 SST		
33	SCREW, SOC. HD. CAP	1	18-8 SST		
34	SCREW, SOC. HD. CAP	1	18-8 SST		
35	SCREW, SOC. HD. CAP	1	18-8 SST		
36	SCREW, SOC. HD. CAP	1	18-8 SST		
37	SCREW, SOC. HD. CAP	1	18-8 SST		
38	SCREW, SOC. HD. CAP	1	18-8 SST		
39	SCREW, SOC. HD. CAP	1	18-8 SST		
40	SCREW, SOC. HD. CAP	1	18-8 SST		

U.S. DEPARTMENT OF ENERGY
WESTINGHOUSE LANSING COMPANY
CART ASSEMBLY

REV NO. 1
TITLE INITIAL
REV NUMBER 1
DATE 10/23/92

REV NO. 2
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 3
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 4
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 5
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 6
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 7
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 8
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 9
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 10
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 11
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 12
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 13
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 14
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 15
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 16
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 17
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 18
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 19
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 20
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 21
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 22
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 23
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 24
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 25
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 26
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 27
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 28
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 29
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 30
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 31
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 32
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 33
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 34
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 35
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 36
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 37
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 38
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 39
TITLE REVISIONS
REV NUMBER
DATE

REV NO. 40
TITLE REVISIONS
REV NUMBER
DATE

OK
6/11/98
JPD

HOLE	"X"	"Y"
A1	.500	13.125
A2	4.500	13.125
A3	.500	7.750
A4	7.645	.500
A5	14.875	.500
A6	14.875	4.625

HOLE	"X"	"Y"
B1	.469	12.313
B2	.469	10.438
B3	.469	8.563
B4	3.026	5.074
B5	3.998	4.102
B6	4.971	3.130
B7	5.943	2.187
B8	6.915	1.185
B9	8.510	.469
B10	9.885	.469
B11	11.260	.469
B12	12.635	.469
B13	14.010	.469
B14	5.453	12.385
B15	6.516	11.513
B16	7.580	10.642
B17	8.644	9.771
B18	9.707	8.899
B19	10.771	8.028
B20	11.835	7.156
B21	12.896	6.285
B22	13.962	5.414

6/11/98
JAS

area removed - field cut

SEE SHEET 1 FOR NOTES

U.S. DEPARTMENT OF ENERGY Nuclear Operations Office WESTINGHOUSE, LANFORD COMPANY	
CART ASSEMBLY	
H-6-14306 0	
CHIEF DOW (1/96) KCH 2297.00	

DWG. NO.	TITLE	REF. NUMBER	TITLE	REVISIONS	DATE	BY	CHKD.	APP'D.
DRAWING TRACEABILITY LIST								
NEXT USED ON								
CADFILE F014306								
REVISIONS								
DATE								
DATE								

GENERAL NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M (82). DIMENSIONS ARE IN INCHES. TOLERANCE ON DECIMALS: $\pm .03$, $\pm .05$, $\pm .005$, ANGLES $\pm 1^\circ$. DIMENSIONING AND TOLERANCING IN BRACKETS ARE GENERAL DIMENSIONS.
- BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
- MACHINED SURFACE TO BE 125μ .
- ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH AMERICAN WELDING STANDARD AWS D1.2 FOR WELDING OF ALUMINUM.
- LOCTITE ALL SCREWS AT ASSEMBLY.
- ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH HANFORD STANDARD HS-V-S-0013. WELDING OF STAINLESS STEEL AND NICKEL ALLOY STRUCTURAL AND OTHER COMPONENTS REVISION "A", 10/19/92.

7) Use Plastic Coated Cable and Crimp connectors as required for retaining wire for ball lock pins

8. Install $\phi 1/8$ pin in item 29 Spring head screw during final assy and adjustment

9) ADD GENERAL NOTE HNF-2964

PARTS LIST/MATERIAL LIST

QTY REQD	PART/ASH NUMBER	DESCRIPTION	MATERIAL/REFERENCE	SHEET NO
2		LOCK NUT, 625-11 UNC-28 W/NYLON INSERT	18-8 SST	1 41
2		.250 PITCH LINK CHAIN	BERG No: RC255S-100	1 42
2		.250 PITCH LINK CHAIN	BERG No: RC255S-80	1 43
1		COVER, HOUSING	ALUMINUM	9 44
3		SCREW, SOC. HD. CAP 625-18 UNF-2A X 1.38	18-8 SST	1 45
6		SCREW, SOC. HD. CAP 112-40 UNC-2A X .31	18-8 SST	1 46
1		BEARING SPACER	BERG No: SS2-48	1 47
5		CLAMP, SPROCKET	ASTM A240 SST TYPE 304	6 48
5		SPACER, SPROCKET	ASTM A240 SST TYPE 304	6 49
10		SPROCKET	BERG No: 25SP-A-24	6 50
5		SCREW, SHOULDER	BERG No: PL-14	1 51
5		CLAMP, SPROCKET/SHAFT	ASTM A240 SST TYPE 304	6 52
20		SCREW, FLT. HD. MACH. 190-24 UNC-2A X 1.00	18-8 SST	1 53
16		BUSHING	CARR-LANE No: P-40-S-375	3+5 54
1		BUSHING	CARR-LANE No: P-48-10-500	5 55
2		BUSHING	CARR-LANE No: P-48-S-500	5 56
3		BUSHING	CARR-LANE No: P-88-28-1.000	5 57
1		BLOCK, BEARING	ALUMINUM	6 58
1		HAND CRANK	ALUMINUM	9 59
4		SCREW, SOC. HD. CAP 190-32 UNC-2A X .88	18-8 SST	1 60
1		INSERT, END EFFECTOR	ASTM A240 SST TYPE 304	9 61
3		LDUA-WEIGHT	WEIGHT ASSY	2 62
2		SCREW, SOC. FLAT HD. CAP 312-18 UNC-2A X .75	18-8 SST	2 63
AR		2 INCH SCHEDULE 40 PIPE	ASTM A240 SST TYPE 304	8 64
1		1/2 Hex X ZAR	Any 300 SST	65
2		Flat Washer	"	66
2		Nuts	"	67
				68
				69
				70
				71
				72
				73
				74
				75
				76
				77
				78
				79
				80

PARTS LIST/MATERIAL LIST

QTY REQD	PART/ASH NUMBER	DESCRIPTION	MATERIAL/REFERENCE	SHEET NO
1		XXXXXXXXXXXX HEEES	XXXXXXXXXXXX	1
2		XXXXXXXXXXXX ASSY	XXXXXXXXXXXX	2
3		XXXXXXXXXXXX	XXXXXXXXXXXX	3
4		XXXXXXXXXXXX	XXXXXXXXXXXX	4
5		XXXXXXXXXXXX	XXXXXXXXXXXX	5
6		XXXXXXXXXXXX	XXXXXXXXXXXX	6
7		XXXXXXXXXXXX	XXXXXXXXXXXX	7
8		XXXXXXXXXXXX	XXXXXXXXXXXX	8
9		XXXXXXXXXXXX	XXXXXXXXXXXX	9
10		HOUSING, CHAIN/SPROCKET	ALUMINUM	7 10
3		CLASP, END EFFECTOR	ALUMINUM	3 11
4		ARM, CLASP, LOWER	ASTM A240 SST TYPE 304	4 12
4		ARM, CLASP, LOWER	ASTM A240 SST TYPE 304	4 13
4		ARM, CLASP, UPPER	ASTM A240 SST TYPE 304	4 14
4		ARM, CLASP, UPPER	ASTM A240 SST TYPE 304	4 15
1		T-HANDLE BALL LOCK PIN	CARR-LANE No: CL-8-BPL-1.75-S-C	1 16
1		SCREW, SOC. HD. CAP 190-32 UNC-2A X .43	18-8 SST	1 17
4		PIVOT, CLASP	ASTM A240 SST TYPE 304	4 18
1		BEARING	PIC No: E7-S7	1 19
3		INTERFACE PIN	ASTM A240 SST TYPE 304	3 20
3		SCREW, SOC. HD. CAP 500-20 UNF-2A X 1.00	18-8 SST	1 21
8		SCREW, FLT. HD. CAP 312-18 UNC-2A X 1.00	18-8 SST	1 22
1		CLASP, LDUA INTERFACE	ALUMINUM	5 23
1		INSERT, LDUA	ASTM A240 SST TYPE 304	4 24
1		L-HANDLE BALL LOCK PIN	CARR-LANE No: CL-8-BPL-1.75-S-C	1 25
1		PLATE, LDUA INTERFACE	ALUMINUM	5 26
4		LEAD SCREW	TECHNO No: HB11SA-751011	6 27
3		RISER	ASTM A240 SST TYPE 304	3 28
4		NUT, LEAD SCREW	SEE DETAIL FOR TECHNO P/N'S	6 29
1		HANDLE, CRANK	ASTM A240 SST TYPE 304	6 30
16		SCREW, SOC. HD. CAP 250-20 UNC-2A X 1.00	18-8 SST	1 31
2		SCREW, HEX. HD. 625-11 UNC-2A X 3.50	18-8 SST	1 32
1		WASHER	CARR-LANE No: CL-3-FW	1 33
8		SCREW, SOC. HD. CAP 312-18 UNC-2A X .88	18-8 SST	1 34
2		EYE BOLT	MOUSTER-CARR No: 1000000000	1 35
3		WASHER	BERG No: 24-12	1 36
3		LOCK NUT, 250-20 UNC-28 W/ NYLON INSERT	18-8 SST	1 37
1		ARM, LIFTING	ASTM A240 SST TYPE 304	8 38
1		HANDLE	ASTM A240 SST TYPE 304	9 39
1		SCREW, SOC. HD. CAP 250-20 UNC-2A X 3.00	18-8 SST	1 40

DATE	BY	CHKD	APPD
17 APR 1996	17 APR 1996	17 APR 1996	17 APR 1996

U.S. DEPARTMENT OF ENERGY
Research Operations Office
WESTINGHOUSE HANFORD COMPANY
END EFFECTOR
TRANSPORT BAR

DWG NO	TITLE	REF NUMBER	TITLE

REVISIONS	DATE	BY	CHKD	APPD

DATE	BY	CHKD	APPD
17 APR 1996	17 APR 1996	17 APR 1996	17 APR 1996

DATE	BY	CHKD	APPD
17 APR 1996	17 APR 1996	17 APR 1996	17 APR 1996

1 PLOT SCALE: 1=1
1 GTITLE: HNF-2964 (1/90)
1 HNF-2964 (1/90)

OK
6/15/98
JAD

26 PLATE, LDUA INTERFACE
SCALE 2/1

23 CLASP, LDUA INTERFACE
SCALE 2/1

SEE SH 1 FOR NOTES

										END EFFECTOR TRANSPORT BAR									
DWG NO		TITLE		REF NUMBER		TITLE		DESCRIPTION		REV		DATE		BY		CHK		APP	
DRAWING TRACEABILITY LIST		NEXT USED ON		REFERENCES		CADFILE		F014307E		REVISIONS		CADDWORKS/2002/12/05		2 PLOT SCALE: 1=1		1		TITLE.DWG (17/98)	
5		↑		4		3		2		1		0		H-6-14307		0		KHJ 2297.00	

U.S. DEPARTMENT OF ENERGY		END EFFECTOR TRANSPORT BAR	
WASHINGTON, D.C. 20545		H-6-14307 0	
DATE: 12/17/96		BY: JAD	
CHECKED: JAD		APPROVED: JAD	
SCALE: 1=1		PLOT SCALE: 1=1	
1		1

*interact with all of
can work to b-b
A-A*

10 HOUSING CHAIN/SPROCKET
SCALE 1/2

U.S. DEPARTMENT OF ENERGY
END EFFECTOR
TRANSPORT BAR

DATE	BY	CHKD	APP'D	REV	DESCRIPTION
10/15/98	1				INITIALS
10/15/98	2				INITIALS
10/15/98	3				INITIALS
10/15/98	4				INITIALS
10/15/98	5				INITIALS
10/15/98	6				INITIALS
10/15/98	7				INITIALS
10/15/98	8				INITIALS
10/15/98	9				INITIALS
10/15/98	10				INITIALS
10/15/98	11				INITIALS
10/15/98	12				INITIALS
10/15/98	13				INITIALS
10/15/98	14				INITIALS
10/15/98	15				INITIALS
10/15/98	16				INITIALS
10/15/98	17				INITIALS
10/15/98	18				INITIALS
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10/15/98	91				INITIALS
10/15/98	92				INITIALS
10/15/98	93				INITIALS
10/15/98	94				INITIALS
10/15/98	95				INITIALS
10/15/98	96				INITIALS
10/15/98	97				INITIALS
10/15/98	98				INITIALS
10/15/98	99				INITIALS
10/15/98	100				INITIALS

Handwritten signature and date: 6/15/98

PARTS LIST/MATERIAL LIST

QTY	REQD	PART/DAWG NUMBER	DESCRIPTION	MATERIAL/REFERENCE	SHEET	TOTL
1	1				41	1
1	1				42	1
1	1				43	1
1	1				44	1
1	1				45	1
1	1				46	1
1	1				47	1
1	1				48	1
1	1				49	1
1	1				50	1
1	1				51	1
1	1				52	1
1	1				53	1
1	1				54	1
1	1				55	1
1	1				56	1
1	1				57	1
1	1				58	1
1	1				59	1
1	1				60	1
1	1				61	1
1	1				62	1
1	1				63	1
1	1				64	1
1	1				65	1
1	1				66	1
1	1				67	1
1	1				68	1
1	1				69	1
1	1				70	1
1	1				71	1
1	1				72	1
1	1				73	1
1	1				74	1
1	1				75	1
1	1				76	1
1	1				77	1
1	1				78	1
1	1				79	1
1	1				80	1

PARTS LIST/MATERIAL LIST

QTY	REQD	PART/DAWG NUMBER	DESCRIPTION	MATERIAL/REFERENCE	SHEET	TOTL
1	1				X	1
1	1				X	2
1	1					3
1	1					4
1	1					5
1	1					6
1	1					7
1	1					8
1	1					9
1	1	H-6-14321	CAMERA HOUSING ASS'Y		2	10
1	1		HOUSING, END EFFECTOR	TITANIUM	6	11
1	1		GASKET	BUNA-N .030 THICK DAPHRAGM MATERIAL	5	12
1	1		BASE, END EFFECTOR	TITANIUM	4	13
1	1		GASKET	BUNA-N .030 THICK DAPHRAGM MATERIAL	5	14
1	1		O-RING	MS-568A-178	2	15
1	1		SCREW, SOC. HD. CAP .250-20 UNC-2A x .50 LG	18-8 SST	2	16
1	1		DOWEL PIN #1250 x .38 LG	18-8 SST	2	17
1	1		SCREW, SOC. HD. CAP .073-84 UNC-2A x .50 LG	18-8 SST	7	18
1	1		SCREW, SOC. HD. CAP .250-20 UNC-2A x 1.62 LG	18-8 SST	2	19
1	1		POTENTIOMETER	DUNCAN No.	2	20
1	1		RETAINER, SEAL	ASTM A240 SST TYPE 304	4	21
1	1		CLAMP, BOOT	ASTM A240 SST TYPE 304	5	22
1	1		SEAL, WIPER	BERG No.	2	23
1	1		WASHER	BERG No.	2	24
1	1		BOOT, GRIPPER	NATURAL RUBBER	7	25
1	1	H-6-14322	GRIPPER ASS'Y		2	26
1	1		CLAMP, BOOT	ASTM A240 SST TYPE 304	5	27
1	1		SCREW, HEX. HD. MACH. .112-40 UNC-2A x .75 LG	18-8 SST	2	28
1	1		WASHER FOR .112 SCREW	18-8 SST	2	29
1	1		LOCK NUT .112-40 UNC-2B	18-8 SST	2	30
1	1		LIGHT ASS'Y		2	31
1	1		RETAINER, LIGHT	TITANIUM	4	32
1	1		SCREW, SOC. HD. CAP .112-40 UNC-2A x .38 LG	18-8 SST	2	33
1	1		BRACKET	ALUMINUM	7	34
1	1		ROD	ASTM A240 SST TYPE 304	7	35
1	1		GROMMET	BERG No.	2	36
1	1		LOCK NUT .190-24 UNC-2B	18-8 SST	2	37
1	1		PLUG	ASTM A240 SST TYPE 304	4	39
1	1		GASKET	BUNA-N .030 THICK DAPHRAGM MATERIAL	4	40

GENERAL NOTES :

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M (82). DIMENSIONS ARE IN INCHES. TOLERANCE ON DECIMALS : X = ±.1, XX = ±.03, XXX = ±.005, ANGLES ±1'. DIMENSIONING AND TOLERANCING IN FRACTIONS PER GENERAL DIMENSIONS.
- BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
- MACHINED SURFACE TO BE 125.
- ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH SWRI WELDING PROCEDURE M-SSH-6.
- LOCTITE (REMOVABLE) ALL SCREWS AT ASSEMBLY.

6. *shrinks fit item 41 around*
Items 11 and 13

THERE IS AN OUTER RING HAMMERED OVER PN 11, 12, 13 ABOUT .06 THICK PROBLEM NO MATERIAL NO INFORMATION BARNE S.

TELL BARNES HE IS MISSING A PN 28, 30, 33, AND ALL 29

VISUAL INSPECTION TECH INC.

Bfield, 2099, 1035, Any 300 Series Stainless

U.S. DEPARTMENT OF ENERGY Richland Operations Office WESTINGHOUSE HANFORD COMPANY	
GRIPPER END EFFECTOR ASSEMBLY	
DWG NO F 2000EN	TITLE H-6-14320
DATE 7	REV 0
KTH 2297.00	

DWG NO	TITLE	REF NUMBER	TITLE	REVISIONS
DRAWING TRACEABILITY LIST	NEXT USED ON	REFERENCES		
CADFILE	FD14320A	CADCODE	DOS:6.22AC02:12.0:SS	

FIELD OF VISION		LENS SIZE		RANGE OF FOCUS		FOCUS POINT ON AXIS FROM END OF LENS	
LENS TYPE	HORIZ. VERT. DIA.						
3.5 mm	107°	56°	137°	ø21mm x 28.0mm	X.XX°	X°	1mm
6 mm	67.5°	44.1°	70°	ø21mm x 28.2mm	X.XX°	X°	12.65mm
12 mm	30°	22.4°	37.3°	ø21mm x 27.8mm	X.XX°	X°	15.9mm

~~DELETES THIS COLUMN~~

CAMERA HOUSING ASSEMBLY
MOUNTED ON ASSEMBLY

PLATE, TIP
END EFFECTOR, LUNA
DRAWING NO. 280233

SEE SHEET 1 FOR NOTES

① Grindon End Effector Assy

QWG NO.	TITLE	REV. NO.	REV. DATE	REV. BY	REV. DATE	REV. BY	REV. DATE	REV. BY	REV. DATE
DRAWING TRACKABILITY LIST									
DATE	TIME	NEXT USED ON	DATE	TIME	DATE	TIME	DATE	TIME	DATE
2. PLOT SCALE: 1=1									

U.S. DEPARTMENT OF ENERGY
GRIPPER
END EFFECTOR
ASSEMBLY
H-6-14320
10

DELETE THIS COLUMN

LENS TYPE	FIELD OF VISION			LENS SIZE	RANGE OF FOCUS	FOCUS POINT ON AXIS FROM END OF LENS
	HORIZ. °'	VERT. °'	DIAG. °'			
3.5 mm	107°	56°	137°	ø21mm x 28.0mm	X.XX" - X.XX"	14mm
6 mm	67.8°	44.1°	70°	ø21mm x 25.7mm	X.XX" - X.XX"	12.85mm
12 mm	30°	22.4°	37.3°	ø21mm x 27.8mm	X.XX" - X.XX"	13.9mm

~~PARTIES~~

SHEET E

VIEW E-E

VIEW A-A
(SEE SHEET 2)

SECTION B-B
CAMERA FIELD OF VIEW

DEC 17 1986
DATE
BY
#3
58

SEE SHEET 1 FOR NOTES

DRAWING TRACEABILITY LIST				DRAWING NO.				TITLE				REF NUMBER				TITLE				REFERENCES				REVISIONS				DESCRIPTION				DATE				BY				CHECKED				APPROVED				U.S. DEPARTMENT OF ENERGY				Richard Operations Office				WESTINGHOUSE HANFORD COMPANY				GRIPPER				END EFFECTOR				ASSEMBLY				H-6-14320				10				GITLE SHW (1/95)				REV. 2297.00			
DRAWING NO.				TITLE				REF NUMBER				TITLE				REFERENCES				REVISIONS				DESCRIPTION				DATE				BY				CHECKED				APPROVED				U.S. DEPARTMENT OF ENERGY				Richard Operations Office				WESTINGHOUSE HANFORD COMPANY				GRIPPER				END EFFECTOR				ASSEMBLY				H-6-14320				10				GITLE SHW (1/95)				REV. 2297.00							
DRAWING NO.				TITLE				REF NUMBER				TITLE				REFERENCES				REVISIONS				DESCRIPTION				DATE				BY				CHECKED				APPROVED				U.S. DEPARTMENT OF ENERGY				Richard Operations Office				WESTINGHOUSE HANFORD COMPANY				GRIPPER				END EFFECTOR				ASSEMBLY				H-6-14320				10				GITLE SHW (1/95)				REV. 2297.00							
DRAWING NO.				TITLE				REF NUMBER				TITLE				REFERENCES				REVISIONS				DESCRIPTION				DATE				BY				CHECKED				APPROVED				U.S. DEPARTMENT OF ENERGY				Richard Operations Office				WESTINGHOUSE HANFORD COMPANY				GRIPPER				END EFFECTOR				ASSEMBLY				H-6-14320				10				GITLE SHW (1/95)				REV. 2297.00

22 CLAMP BOOT
SCALE 1/1

27 CLAMP BOOT
SCALE 1/1

12 GASKET
SCALE 1/1

14 GASKET
SCALE 1/1

ADD

SEE SHEET 1 FOR NOTES

U.S. DEPARTMENT OF ENERGY
WESTINGHOUSE MANUFACTURING COMPANY
GRIPPER
END EFFECTOR
ASSEMBLY

DATE	2000	4750	H-6-14320	0
REV	1	2	3	4
BY	1	2	3	4
CHKD	1	2	3	4
APP'D	1	2	3	4
DATE	2000	4750	H-6-14320	0
REV	1	2	3	4
BY	1	2	3	4
CHKD	1	2	3	4
APP'D	1	2	3	4

DATE	2000	4750	H-6-14320	0
REV	1	2	3	4
BY	1	2	3	4
CHKD	1	2	3	4
APP'D	1	2	3	4
DATE	2000	4750	H-6-14320	0
REV	1	2	3	4
BY	1	2	3	4
CHKD	1	2	3	4
APP'D	1	2	3	4

2. PLOT SCALE: 1=1

[illegible]

KEY: MISS						PARTS LIST/MATERIAL LIST					
-019	-060	-065	-045	-050	-005	-019	PART/QUANTITY	OCCUPATION	MATERIAL/REFERENCE	SHEET	TOTL NO
							-010	ASSEMBLY		2	1
							-020	CAMERA COVER AND LIGHT HOUSING ASSY		8	2
											3
											4
											5
											7
											8
											9
							1	HOUSING, CAMERA	ASTM A240 SST TYPE 304	3	10
								SHIELDING, LEAD	LEAD	2	11
								ENCLOSURE, BOTTOM	ASTM A240 SST TYPE 304	8	12
							4	CLAMP, CAMERA	ALUMINUM	5	13
							8	SCREW, SOC. HD. CAP 164-32 UNC-2A x .38 LG.	18-8 SST	2	14
								SCREW, SOC. HD. CAP 250-32 UNC-2A x .62 LG.	18-8 SST	2	15
							1	GASKET	BUNA-N .030 THK DIAPHRAN MATERIAL	6	16
								SCREW, SOC. HD. CAP 112-40 UNC-2A x .25 LG.	18-8 SST	2	17
							1	COVER	ASTM A240 SST TYPE 304	5	18
								GASKET	BUNA-N .030 THK DIAPHRAN MATERIAL	6	19
								SPRING	BERG NO. 2-20	2	20
								T-WASHER	BERG NO. 2-20	2	21
								SHOULDER SCREW	BERG NO. 2-20	2	22
							4	SCREW, SOC. HD. CAP 190-32 UNF-2A x 1.00 LG.	18-8 SST	2	23
								SPRING	CENT No. 1-80	2	24
								SCREW, SOC. HD. CAP 112-40 UNC-2A x .31 LG.	18-8 SST	2	25
								WITON O-RING	CRAWFORD NO. BN9-OR-0904	2	26
								PLUG, SAE/MS HOLLOW HEX SOCKET	SAE 1045	2	27
								CAMERA ASSEMBLY		2	28
								T-WASHER	ASTM A240 SST TYPE 304	6	29
							1	PLATE, MOUNTING, CAMERA	ALUMINUM	7	30
								PLATE, HINGE, CAMERA	ALUMINUM	7	31
							4	BUSHING	GARLOCK NO. 1000	2	32
							1	SHAFT	ASTM A240 SST TYPE 304	6	33
							2	SPRING	CENT No. 10809	2	34
								PLATE, MOUNTING, CAMERA	ALUMINUM	7	35
							1	PLATE, HINGE, CAMERA	ALUMINUM	7	36
							2	O-RING	APPLE B66 x .063	2	37
								OPTICAL WINDOW		2	38
							2	RING, RETAINING	ASTM A240 SST TYPE 304	5	39
							2	WASHER	ASTM A240 SST TYPE 304	6	40

↓
NEED MORE INFO ON LIGHT.
ALSO NEED INFO
ON PURGING LINES

GENERAL NOTES :

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M (82). DIMENSIONS ARE IN INCHES. TOLERANCE ON DECIMALS: $X.XX \pm .03$, $X.X \pm .05$, ANGLES $\pm 1^\circ$. ~~DIMENSIONING AND TOLERANCING PRACTICES ARE GENERAL DIMENSIONS.~~
2. BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
3. MACHINED SURFACE TO BE $125 \sqrt{\text{in}}$
4. ALL WELDING OPERATIONS TO BE PERFORMED IN ACCORDANCE WITH SWRI WELDING PROCEDURE M-SSH-6.

OPTIONAL PART MAY BE
INSTALLED BETWEEN
ITEM 13 AND ITEMS 30
AND 35 (CAMERA MOUNTING PLATE)

6 - INFO NOTE

266A (0178) ASMA 14245
PN
018

PN 48
.018THK

														CAMERA HOUSING ASSEMBLY													
														F 200 G 4750 H-6-14321 10													
														DATE 7/91 TIME 202319 SHEET 1 OF 8													
DWG NO. TITLE REF NUMBER REFERENCES														REVISED DATE BY CHKD APP'D OTHER APPROVAL REQUIRED													
DRAWING TRACEABILITY LIST														NEXT USED ON CADFILE F014321A IADCODE WNN95ACD2:10:25 SS													
														2 2 DATE 1

① ASSEMBLY
(SCALE 2/1)

- doubt : t

DWG NO	TITLE	REV NUMBER	REFERENCES	TITLE	NO	YES	DESCRIPTION	REV DATE	REV DATE	DATE	APPROVAL BY
	DRAWING TRACEABILITY LIST	NEXT USED ON	H-6-14321 SH 1	CADFILE	F014321B						
							REVISIONS				
							CADDCODE	WINGS-CDD-12.0.S			

NAME G. CANDANAYAN 1/17/76		U.S. DEPARTMENT OF ENERGY				
ADDRESS 1000 1/17/76		Field Office Westinghouse Hartford Company				
CITY 1/17/76		CAMERA HOUSING ASSEMBLY				
STATE 1/17/76						
ZIP 1/17/76						
DATE 1/17/76						
CLASS	NO.	SIZE	SLUG NO.	PAGE NO.	PAGE NO.	REV.
1/17/76	1/17/76	F 200 G	4750	H-6-14321	0	
S	SCALE	1/1	GP	702319	PAGE	2 of 2

144 THRU

delete
Cross
Hatch
(Part is Used)

80

24
6.112

TOOK OFF ALL
TRNG POSITIONING

[illegible]

Name: G. GANGAWAY		U.S. DEPARTMENT OF ENERGY	
Address: 1000 17th St		NOT Field Office	
City: Washington		Westinghouse Hartford Company	
State: DC			
Zip: 20004			
Phone: 442-1418			
Fax: 442-1418			
E-mail: ggangaw@hrt.com			
Web: 442-1418			
Notes:			
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History:			
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2796
2000

CAMERA COVER AND LIGHT HOUSING ASSY
SCALE 1/1

ENCLOSURE BOTTOM
SCALE 1/1

FLAT PATTERN Item 12
SCALE 1/1

U.S. DEPARTMENT OF ENERGY NATIONAL BUREAU OF STANDARDS CAMERA HOUSING ASSEMBLY	
FIG. NO.	4750
REV.	1
DATE	11-6-143210
DRAWN BY: [Signature]	
CHECKED BY: [Signature]	
APPROVED BY: [Signature]	
SCALE: 1/1	
SHEET: 1 OF 1	

shown

PARTS LIST/MATERIAL LIST

-039	-060	-080	-040	-000	-020	CITE	PARTS NAME NUMBER	DESCRIPTION	MATERIAL/REFERENCE	SHEET	TOTL PAGES
					X		010	ASSEMBLY		2	1
					X					2	1
					X					3	1
					X					4	1
					X					5	1
					X					6	1
					X					7	1
					X					8	1
					X					9	1
					X		1	SCREW, SOC. HD. CAP. .500-13 UNC-2A x 1.00 LG	18-8 SST	2	10
					X		1	O-RING	AS-568A-049	2	11
					X			YOKE, CYLINDER	TITANIUM	3	12
					X		1	CYLINDER	COMP. No. R4x112TBE HTV	2	13
					X		1	YOKE, PISTON	TITANIUM	4	14
					X		4	LINK	TITANIUM	4	15
					X		2	FINGER 1	TITANIUM	4	16
					X		2	FINGER 2	TITANIUM	4	17
					X		12	BUSHING	BRONZE 660	3	18
					X		12	SHAFT	ASTM A240 SST TYPE 304	3	19
					X		8	SCREW, SOC. HD. CAP. .375-16 UNC-2A x .62 LG	18-8 SST	2	20
					X		2	PAD, FINGER	TITANIUM	4	21
					X		2	FINGER, GRIPPER	TITANIUM	5	22
					X		24	WASHER	ASTM A240 SST TYPE 304	3	23
					X		16	RETAINER	ASTM A240 SST TYPE 304	2	24
					X		16	SCREW, LOW HD. SOC. CAP. .375-16 UNC-2A x .75 LG	18-8 SST	2	25
					X		6	SCREW, FLAT HD. CAP. .375-16 UNC-2A x 1.25 LG	18-8 SST	2	26
					X		4	SCREW, SOC. HD. CAP. .312-18 UNC-2A x 1.00 LG	18-8 SST	2	27
					X		4	SCREW, LOW HD. SOC. CAP. .312-18 UNC-2A x .75 LG	18-8 SST	2	28
					X					29	
					X					30	
					X					31	
					X					32	
					X					33	
					X					34	
					X					35	
					X					36	
					X					37	
					X					38	
					X					39	
					X					40	

8. Apply self adhesive foam pad to Item 22 as required (optional)

[illegible]

1 ASSEMBLY
SCALE 1/1

FIG. NO.	TITLE	REV. NO.	REV. DATE	REV. BY	REV. CHECK
1	ASSEMBLY	1	7/2/90	W. J. HARRIS	W. J. HARRIS
2	GRIPPER	1	7/2/90	W. J. HARRIS	W. J. HARRIS
3	ASSEMBLY	1	7/2/90	W. J. HARRIS	W. J. HARRIS

FIG. NO.	TITLE	REV. NO.	REV. DATE	REV. BY	REV. CHECK
1	ASSEMBLY	1	7/2/90	W. J. HARRIS	W. J. HARRIS
2	GRIPPER	1	7/2/90	W. J. HARRIS	W. J. HARRIS
3	ASSEMBLY	1	7/2/90	W. J. HARRIS	W. J. HARRIS

FIG. NO.	TITLE	REV. NO.	REV. DATE	REV. BY	REV. CHECK
1	ASSEMBLY	1	7/2/90	W. J. HARRIS	W. J. HARRIS
2	GRIPPER	1	7/2/90	W. J. HARRIS	W. J. HARRIS
3	ASSEMBLY	1	7/2/90	W. J. HARRIS	W. J. HARRIS

BDJ
6/11/98

VIT
Control
CEE-INTERCONNECT
CABLE-VI
Module

Shaw: Discontinued
not existing
Discontinued

Not
Verified
Leave
or
drawn

exist
hemare

NOTE: 1. ^x Strain relief box mounting receptacles will be procured if available. If not an alternate method of strain relief will be used on the connectors.

2. All connectors to be mounted on back of enclosures, unless specified otherwise.

[illegible]

541

CABLE ASSEMBLIES FOR GEI CONTROL ELECTRONICS

OK

M53126F14-18P

VIA CONTROL WIRE

- A - RESISTOR 500K OHM
- B - RESISTOR 500K OHM
- C - RESISTOR 500K OHM
- D - RESISTOR 500K OHM
- E - RESISTOR 500K OHM
- F - RESISTOR 500K OHM
- G - RESISTOR 500K OHM
- H - RESISTOR 500K OHM
- I - RESISTOR 500K OHM
- J - RESISTOR 500K OHM
- K - RESISTOR 500K OHM
- L - RESISTOR 500K OHM
- M - RESISTOR 500K OHM
- N - RESISTOR 500K OHM
- O - RESISTOR 500K OHM

M53126F14-18P

VIA CONTROL WIRE

OK

851-06EC12-35SD

VIA CONTROL WIRE

- A - RESISTOR 500K OHM
- B - RESISTOR 500K OHM
- C - RESISTOR 500K OHM

951-06EC12-3P50

VIA CONTROL WIRE

WIRE	DESCRIPTION
W1	STANDARD 120VAC POWER
W2	STANDARD 120VAC POWER
W3	STANDARD 120VAC POWER
W4	STANDARD 120VAC POWER
W5	STANDARD 120VAC POWER

TYPE 5JT 18AWG/3C

M53126E12-10S

VIA CONTROL WIRE

- A - RESISTOR 500K OHM
- B - RESISTOR 500K OHM
- C - RESISTOR 500K OHM
- D - RESISTOR 500K OHM
- E - RESISTOR 500K OHM
- F - RESISTOR 500K OHM
- G - RESISTOR 500K OHM
- H - RESISTOR 500K OHM
- I - RESISTOR 500K OHM
- J - RESISTOR 500K OHM
- K - RESISTOR 500K OHM
- L - RESISTOR 500K OHM
- M - RESISTOR 500K OHM
- N - RESISTOR 500K OHM
- O - RESISTOR 500K OHM

M53126F16-26SX
(SOCKET IN SOCKET)
(STANDARD PLUG)

VIA CONTROL WIRE

- A - RESISTOR 500K OHM
- B - RESISTOR 500K OHM
- C - RESISTOR 500K OHM

SEPARATELY CONNECTED TO THE GEI PANEL

SHEETS OF INJECTED PADS AND TO DISMISS
GROUND AT 0.000 22.000 OF CABLE NO.

6/11/98

U.S. DEPARTMENT OF ENERGY
WESTINGHOUSE BANGOR COMPANY
CABLE ASSEMBLIES

DATE	TITLE	REV. NUMBER	REV. DATE	REV. DESCRIPTION
01/15/84	01/15/84	1		REVISIONS
01/15/84	01/15/84	2		REVISIONS
01/15/84	01/15/84	3		REVISIONS

PNEUMATIC BLOCK DIAGRAM

Supply Air
See H-6-14150 (Purge Gas PID)

1. BOTH #4 PORTS MUST BE PLUGGED ON MANUAL OVERRIDE VALVES.
2. MANUAL OVERRIDE VALVES ARE 3 POSITION, 4 WAY VALVES WITH BLOCKED PORTS IN CENTER POSITION AND DETENTS TO HOLD SETTING. IN CENTER DETENT FOR NORMAL OPERATION.
3. ELECTRICAL LOCKING VALVES ARE ON OFF 2 WAY VALVES WITH ELECTRIC SOLENOID FOR OPERATIONS.
4. BOTH #2 AND #3 PORTS MUST BE PLUGGED ON SOLENOID VALVES.
5. EXTERNAL PILOTS ARE USED ON ELECTRIC SOLENOID VALVES.

6. Walkdown Note

DRAWING TRACEABILITY LIST		REF NUMBER	TITLE	REVISIONS	CADFILE	FOI4325A	WINDSACD2.12.0.55	2 PLOT SCALE: 1=1
DWG NO	TITLE	REF NUMBER	TITLE	REVISIONS	CADFILE	FOI4325A	WINDSACD2.12.0.55	2 PLOT SCALE: 1=1
DRAWING TRACEABILITY LIST		REF NUMBER	TITLE	REVISIONS	CADFILE	FOI4325A	WINDSACD2.12.0.55	2 PLOT SCALE: 1=1
DRAWING TRACEABILITY LIST		REF NUMBER	TITLE	REVISIONS	CADFILE	FOI4325A	WINDSACD2.12.0.55	2 PLOT SCALE: 1=1

DEC 18 1968

U.S. DEPARTMENT OF ENERGY

WESTINGHOUSE BAREFOOT COMPANY

PNEUMATIC BLOCK DIAGRAM

H-6-14325

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ADD PARTS TO
ON SHEET 12 TO
PARTS LIST
FOR NO. 20
ASSEMBLY

DECON MODULE ASSEMBLY

PARTS MATERIAL LIST		MANUFACTURE DESCRIPTION		AMOUNT/REMARKS		UNIT	QTY
1	8235 INCH	BANK-11 TUBE		PARALLEL CHAIR	10	52	
2	2-115 INCH-70		10 614	PARALLEL CHAIR	10	52	
3	2-115 INCH-70	D-RING		PARALLEL CHAIR	10	52	
4	1/4 W-SS250	SPRING-20 NOTEL		SPRING SYSTEM COIL	10	54	
5	SS-000-B-4PT	SMOKELOCK QUICK RELEASE		SMOKELOCK	10	55	
6	SS-4-CH	1/2 INPT GAGE WHEEL		SMOKELOCK	10	55	
7	1/4-20X1.25 x 1/4 CSK FL TUB			SMOKELOCK/CLAMP	10	57	
8	1/4 PLAT WASHER				58	58	
9	1/2-20X1.25				59	59	
10	2815-1-A-11	WHEEL SEALANT		CAULOC	5	60	
11	70 785 DR EQUIV	FOLDING WIND SHUD		CAULOC	10	62	
12	SS-100H4H4H-13T	SMOKELOCK HOSE	604	DOWN COILING	8	64	
13	SS-100H4H4H-13T	SMOKELOCK HOSE		SMOKELOCK	1	66	
14	SS-000-B-4PT	SMOKELOCK QUICK RELEASE		SMOKELOCK	1	67	
15	-031	WELD NICK PLANCE		WELD	12	68	
16	W1818H-1600-5L	B-1618HMS COUPLING		WSS AESTOP/3K	11	69	
17	-032	SPRINT PRICE		404 SST	12	70	
18	1/2 INPT COUPLE			404 SST	12	71	
19	1/2 X 1/4 CLOSURE STEIN			444-991	11	72	
20	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/HANDS	11	74	
21	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	74	
22	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
23	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
24	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
25	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
26	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
27	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
28	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
29	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
30	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
31	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
32	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
33	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
34	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
35	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
36	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
37	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
38	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
39	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
 	
86	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
87	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
88	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
89	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
90	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
91	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
92	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
93	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
94	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
95	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
96	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
97	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
98	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
99	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	
100	1/2 X 1/4 CLOSURE STEIN			SMOKELOCK/CLAMP	11	75	

3/17
 ALSO
 ADD
 12 7/8 NOTES
 4 LOCK
 WAS HERE'S IT
 ADDY II
 ADD PN FOR
 ECH FIRST
 ALSO
 ADD
 PIPING
 PARTS
 SHOCK
 PLATE
 CUT
 AWAY

PARTS MATERIAL LIST		MANUFACTURING INFORMATION		MATERIALS		QUANTITY	
ITEM NO.	PART NAME	QTY	UNIT	QTY	UNIT	QTY	UNIT
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17
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19	19	19	19	19	19	19	19
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22	22	22	22	22	22	22	22
23	23	23	23	23	23	23	23
24	24	24	24	24	24	24	24
25	25	25	25	25	25	25	25
26	26	26	26	26	26	26	26
27	27	27	27	27	27	27	27
28	28	28	28	28	28	28	28
29	29	29	29	29	29	29	29
30	30	30	30	30	30	30	30
31	31	31	31	31	31	31	31
32	32	32	32	32	32	32	32
33	33	33	33	33	33	33	33
34	34	34	34	34	34	34	34
35	35	35	35	35	35	35	35
36	36	36	36	36	36	36	36
37	37	37	37	37	37	37	37
38	38	38	38	38	38	38	38
39	39	39	39	39	39	39	39
40	40	40	40	40	40	40	40
41	41	41	41	41	41	41	41
42	42	42	42	42	42	42	42
43	43	43	43	43	43	43	43
44	44	44	44	44	44	44	44
45	45	45	45	45	45	45	45
46	46	46	46	46	46	46	46
47	47	47	47	47	47	47	47
48	48	48	48	48	48	48	48
49	49	49	49	49	49	49	49
50	50	50	50	50	50	50	50

BUNA N WILL BE THE CHOSEN MATERIAL UNLESS CONTACT WITH NITROGEN IS ANTICIPATED, IN WHICH CASE THE MATERIAL SHOULD BE VITON.

GENERAL NOTES

1. REMOVE ALL BURRS AND SHARP EDGES.
2. SURFACE FINISH SHALL BE 125 RHRR OR BETTER.
3. TOLERANCES

MARKET FLAVOR

7. FOR WIRING OF THE
H-6-14342

ESSB

11.30
23.31
24.11
24.11

27.17
19
46.

27.17
4.25
22.92

Flat Pattern Item 27

DRAWING TITLE		DRAWING NO.		DRAWING DATE		DRAWING BY		DRAWING CHECK		DRAWING APPROVE		DRAWING SCALE		DRAWING SHEET	
INNER CAN SUBASSEMBLY		H-6-14340		0		1		2		3		4		5	
INNER CAN SUBASSEMBLY		H-6-14340		0		1		2		3		4		5	
INNER CAN SUBASSEMBLY		H-6-14340		0		1		2		3		4		5	

14,373
19,70
5,177
11,53
7,34
7,14
1464

24 ~~INNER-RAD CAN~~
I Flat Pattern ✓ 24

Item 25 Flat Pattern ✓

Flat Pattern ✓ 26

25 UPPER INNER CONE

26 LOWER INNER CONE

ITEM NO.	TITLE	REV.	DATE	BY	CHKD.	APP.	REVISIONS	DATE	BY	CHKD.	APP.
24	INNER-RAD CAN										
25	UPPER INNER CONE										
26	LOWER INNER CONE

INNER CAN DETAILS
H-5-14340
4750
702318

3.14/4612

1730
5.77
17.53

40.35
28.83
17.30

40.35
5.77
4613

11,51
11,51
23,02

Done

										OUTER CUB SUBASSEMBLY									
										PART NO. 2000EN 4750 H-6-14340 REV. 1/4 BY 702319 DATE 5 67									
DRAWING TRACEABILITY LIST										DRAWING NO. 2000EN 4750 H-6-14340									
TITLE										DESCRIPTION									
REFERENCES										REVISED									
NEXT USED ON										CADFILE: F014340E									
5										3

6 BOTTOM PLATE SUBASSEMBLY

29 BOTTOM PLATE

ESSENTIAL
DIVISION

DRAWING INFORMATION	
DRAWING NO. HNF-2904	
TITLE BOTTOM PLATE SUBASSEMBLY	
DATE 10/20/83	
BY 1000001	
CHECKED 1000001	
APPROVED 1000001	
DESIGNED 1000001	
DRAWN 1000001	
SCALE 1:1	
SHEET 1 OF 1	
PROJECT HNF-2904	
SUBJECT BOTTOM PLATE SUBASSEMBLY	
REVISIONS	
REVISION NO. 1	
REVISION DESCRIPTION	
REVISION DATE	
REVISION BY	
REVISION CHECKED	
REVISION APPROVED	
REVISION DESIGNED	
REVISION DRAWN	
REVISION SCALE	
REVISION SHEET	
REVISION PROJECT	
REVISION SUBJECT	
REVISION REVISION NO.	
REVISION REVISION DESCRIPTION	
REVISION REVISION DATE	
REVISION REVISION BY	
REVISION REVISION CHECKED	
REVISION REVISION APPROVED	
REVISION REVISION DESIGNED	
REVISION REVISION DRAWN	
REVISION REVISION SCALE	
REVISION REVISION SHEET	
REVISION REVISION PROJECT	
REVISION REVISION SUBJECT	
REVISION REVISION REVISION NO.	
REVISION REVISION REVISION DESCRIPTION	
REVISION REVISION REVISION DATE	
REVISION REVISION REVISION BY	
REVISION REVISION REVISION CHECKED	
REVISION REVISION REVISION APPROVED	
REVISION REVISION REVISION DESIGNED	
REVISION REVISION REVISION DRAWN	
REVISION REVISION REVISION SCALE	
REVISION REVISION REVISION SHEET	
REVISION REVISION REVISION PROJECT	
REVISION REVISION REVISION SUBJECT	

André Delbecq
View

DWG NO	TITLE	REV NUMBER	REFERENCES	TITLE
54-6000-0270/01	DRAWING TRACKABILITY LIST	NOT USED ON		

NOZZLE CARTRIDGE SUBASSEMBLY AND INSTALLATION	
REV	DATE
1	1/4
2	7/23/79
3	7/23/79
4	7/23/79
5	7/23/79
6	7/23/79
7	7/23/79
8	7/23/79
9	7/23/79
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98	7/23/79
99	7/23/79
100	7/23/79

Done

11 OUTER SUPPORT SUBASSEMBLY

This Weld Performed on Assy ID

OK'S
AS IS

41 OUTER SUPPORT
4 RECD

68 WELD NECK FLANGE

70 SPOOL PIECE

Check reference
100
1/2 x 1/4
+ Reducing Bushing
+ 1/4 Nipple,
103 + 1/4
104 + 1/4
Elbow

VIEW S

SURFACE FINISH VIEW

DRAWING INFORMATION		REV. NO.		REV. DATE		REV. BY		REV. CHECK		REV. APPROVE	
TITLE		DATE		BY		CHECK		APPROVE		DATE	
WELD NECK FLANGE AND SPOOL PIECE		H-6-14340		1		2		3		4	
DRAWING SCALE		1:1		1:1		1:1		1:1		1:1	
PROJECT NO.		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT NAME		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT LOCATION		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT DESCRIPTION		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT STATUS		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT OWNER		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT CONTACT		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT PHONE		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT FAX		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT E-MAIL		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT WEBSITE		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT ADDRESS		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT CITY		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT STATE		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT ZIP		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT COUNTRY		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340	
PROJECT COMMENTS		H-6-14340		H-6-14340		H-6-14340		H-6-14340		H-6-14340

QTY	PARTS NUMBER	DESCRIPTION	UNIT
1	3/4"	STAINLESS STEEL BONDING	WELD, W/STITCHED
1	2" X 10K W/ 3/4" JACKING	BEAM, INSULATION	BEAM, INSULATION
1	2" X 10K W/ 3/4" JACKING	BEAM, INSULATION	BEAM, INSULATION
1	2" X 10K W/ 3/4" JACKING	BEAM, INSULATION	BEAM, INSULATION
1	2" X 10K W/ 3/4" JACKING	BEAM, INSULATION	BEAM, INSULATION
1	2" X 10K W/ 3/4" JACKING	BEAM, INSULATION	BEAM, INSULATION
1	2" X 10K W/ 3/4" JACKING	BEAM, INSULATION	BEAM, INSULATION
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1	2" X 10K W/ 3/4" JACKING	BEAM, INSULATION	BEAM, INS

QTY	PARTS NUMBER	DESCRIPTION	UNIT
1	100000	7'-6" >	
PARTS/MATERIAL LIST			
1	100000	7'-6" >	
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LUDIA WATER DECON TRAILER
 PIPING SCHEMATIC
 H-6-14341

Water Decontamination
Power and Control
WATER DECON
POWER AND CONTROL

DWG NO	TITLE	REV. NUMBER	REFERENCES
DRAWING TRACEABILITY LIST			
			NEXT USED ON

REV	REVISIONS		APPROVALS R/D/DATE
CADFILE F014342B	CADCODE	WIN95-ACD2:12:0:SS	

	F	2006	5903	H-6-14342	0
NOV	NOV		702319	2	2

TERMINAL BLOCK LEGEND	
FROM PAIR 1	1 U TO GND STRAPER
FROM PAIR 2	1 U TO GND STRAPER
FROM PAIR 3	1 U TO GND STRAPER
FROM PAIR 4	1 U TO GND STRAPER
TO M2 1	4 U FROM PAIR 1
TO M2 2	5 U FROM PAIR 1
TO M2 3	6 U FROM PAIR 1
TO M2 4	7 U FROM PAIR 1
TO M2 5	8 U FROM PAIR 1
TO M2 6	9 U FROM PAIR 1
TO M2 7	10 U FROM PAIR 1
TO M2 8	11 U FROM PAIR 1
TO M2 9	12 U FROM PAIR 1
TO M2 10	13 U FROM PAIR 1
TO M2 11	14 U FROM PAIR 1
TO M2 12	15 U FROM PAIR 1
TO M2 13	16 U FROM PAIR 1
TO M2 14	17 U FROM PAIR 1
TO M2 15	18 U FROM PAIR 1
TO M2 16	19 U FROM PAIR 1
TO M2 17	20 U FROM PAIR 1
TO M2 18	21 U FROM PAIR 1
TO M2 19	22 U FROM PAIR 1
TO M2 20	23 U FROM PAIR 1
TO M2 21	24 U FROM PAIR 1
 	

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Table of Contents

- 1 - This page, general layout
- 2 - General component layout
- 3 - Cable assembly details

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Notes:

- 1) This Assembly drawing is only intended to show the general layout. Only critical components are identified in the parts list PL200215. Parts not listed in parts list are to be provided by assembly subcontractor.
- 2) See LDUA Subsystem Controller Pendant Schematic, dwg #200216, for wiring details. All items in drawing 200216 are detailed in PL200215.
- 3) See sheet 3 for details on cable assembly which is attached to pendant.
- 4) Pendant enclosure is listed in parts list, dwg #200215 as item A3.
- 5) See LDUA System Interconnection, dwg #200202, for details on cable connections.

Drawn By G. Battiston	Spar Aerospace Limited Brampton Ontario Canada			
Checked K. Karia				
Electrical Date				
Q.A. Date				
Release Date				
SIZE B	CAGE CODE 38309	DWG NO 200215	Release D	REV A
SCALE N/A		SHEET 1 of 3		
CAD GENERATED USING ORCAD RELEASE 386+ 1.2				

Connector terminated
pigtail cable

Table 1 - Designators and lengths

Dash Number	Cable Designation	Length (meters)		Label "C" (Note1)	Label "D" (Note1)
		'A'	'B'		
-1	A4A3W1	10.3	10.0	A4A3W1P1	A4A3W1

Table 2 - Parts

Dash Number	Cable Desig.	Description	R1 - Terminator			R2 (Ref Table.3) Qty A/R	R3 - Label			Wiring as per Dwg	
			Part No.	Qty	Manuf.		Part No.	Qty	Manuf.	Dwg #	Rev
-1	A4A3W1	Pendant	CIR 065SLX-20-11P-F80-T12-13	1	Veam	15,18	TMS/WHITE/SIZE/AS RO 2	2	Raychem	200215	-

Table 3 - Wire materials

Type No.	Description	Part No.	Manufacturer
15	Shield termination (#22TSP)	ST63-25522-90	Raychem
18	9 pairs of #22 AWG TSP	8774	Belden

NOTES:

- Label designators "C" and "D" are labelled with label designations as shown in Table 1, followed by : 1) The part number "P.N.200215-xx", where xx is the dash number shown in Table 1, and 2) "Rev x", where x is the revision number of this drawing.
- Each individual wire to be labelled with pin number of R1. Twisted shielded pairs to be terminated with shield terminators. Approximately 5 centimeters of wire is exposed after shield terminator.

Pendant Cable Assembly

Spar Aerospace Limited Brampton Ontario Canada			
Title LDUA S.C. Pendant General Assembly			
Size	Document Number	REV	
B	200215	A	
Date:	June 9, 1995	Sheet	3 of 3

PL200215 - LDUA Subsystem Controller Pendant : Parts List

Rev "A" Printed 05/02/97

Call Number	Description	Manufacturer	PART TYPE (for Reference Only)	Order Part #	QUANTITY
1 A1:1	Joystick with boot, Push button, CT	Measurement Systems		521-BPS	1
2 A2:1	Terminal, CP2502, RS422, ext temp, 7-28VDC, backlite LEDs, hex keypad codes, custom silkscreen	Termiflex		99-5350-1001	1
3 A3:1	Pendant Enclosure	J.R.M Controls		FGP-02	1
4 S1:1	Switch, Key, 2 pos	Siemens		3SB1 100-4LB51	1
5 S1:2	Switch Contact N.O.	Siemens		3SB1 400-0B	1
6 S2:1	Switch PushB Mushroom	Siemens		3SB1 100-1HC51	1
7 S2:2	Switch Contact NC	Siemens		3SB1 400-0C	1
TB1:1	Terminal Block - 1 level	Pheonix	UK4	30 03 01 7	12
TB1:2	end cover	Pheonix	D-UK 4,10	30 03 02 0	1
TB1:3	Label	Pheonix	ZB6,1-4	ZB6,1-4	1
TB1:4	End clamp and Label	Pheonix	UBE with ES/KMK3	10 04 08 9	1
TB1:5	end clamp	Pheonix	E/UK	12 01 44 2	1
TB2:1	Terminal Block - 1 level	Pheonix	UK4	30 03 01 7	2
TB2:2	end cover	Pheonix	D-UK 4,10	30 03 02 0	1
TB2:3	Label	Pheonix	ZB6,1-4	ZB6,1-4	1
TB2:4	End clamp and Label	Pheonix	UBE with ES/KMK3	10 04 08 9	1
TB2:5	end clamp	Pheonix	E/UK	12 01 44 2	1
TB3:1	Terminal Block - 1 level	Pheonix	UK4	30 03 01 7	2
TB3:2	end cover	Pheonix	D-UK 4,10	30 03 02 0	1
TB3:3	Label	Pheonix	ZB6,1-4	ZB6,1-4	1
TB3:4	End clamp and Label	Pheonix	UBE with ES/KMK3	10 04 08 9	1
R1	resistor			16.9K 5% 0.5 Watt	1

Not
Check
Would
need to
open
pendant
to
check
inside

BRD
6/5/98

[illegible]

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Major System Unit Designation Number : A5
Minor System Unit Designation Number : A2

Notes:

- 1) See Control Panel Schematic, dwg 200222, for details
- 2) See PL200221 for parts lists details

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Checked K.Karia				
Electrical Date				
Q.A. Date				
Release Date				
SIZE B		CAGE CODE 38309	DWG NO 200221	Release D
SCALE N/A		SHEET 1 of 1		
CAD GENERATED USING ORCAD RELEASE 386+ 1.0				

Call Number	Description	Manuf.	PART TYPE (for Reference Only)	Order Part #	Quantity
S1:1 ^{OK}	Switch Pushbutton momentary - White	Siemens		3SB1 118-0AG51 [*]	1
S1:2	Switch Contact N.O.	Siemens		3SB1 400-0B [*]	1
L1:1 ^{OK}	Lamp and holder 24V	Siemens		3SB1 400-2 X A	1
S2:1	Switch Pushbutton momentary - White	Siemens		3SB1 118-0AG51 [*]	1
S2:2	Switch Contact N.O.	Siemens		3SB1 400-0B [*]	1
L2:1	Lamp and holder 24V	Siemens		3SB1 400-2 X A	1
S3:1	Switch Push Button 24V DPST	Allen-Bradley		800H-FRXTQ24 X A ⁵	1
S3:2	illuminated Red Push-Twist Mushroom Head for Pushbutton	Allen-Bradley		800T-N306R [*]	1
S4:1	Switch Pushbutton momentary - White	Siemens		3SB1 118-0AG51 [*]	1
S4:2	Switch Contact N.O.	Siemens		3SB1 400-0B [*]	1
L4:1	Lamp and holder 24V	Siemens		3SB1 400-2 X A	1
S5:1	Switch Push Button 24V DPST	Allen-Bradley		800H-FRXTQ24 X A ⁵	1
S5:2	illuminated Yellow Push-Twist Mushroom Head for Pushbutton	Allen-Bradley		800T-N306A [*]	1
L5:1	Pilot Light - Red	Siemens		3SB1 118-6BC51 [*]	1
L5:2	Lamp and holder 24V	Siemens		3SB1 400-2 X A	1

* Not verifiable

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6/5/98

TBD

Pendant Component Layout

Title		Spar Aerospace Limited	
Brampton Ontario Canada			
LPUA S.C. Pendant General Assembly			
Size/Document Number		200215	
REV		A	
Date		June 9, 1995/Sheet 1	

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			ECN No. N/A					
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