



SPECIAL INSTRUCTION # 8

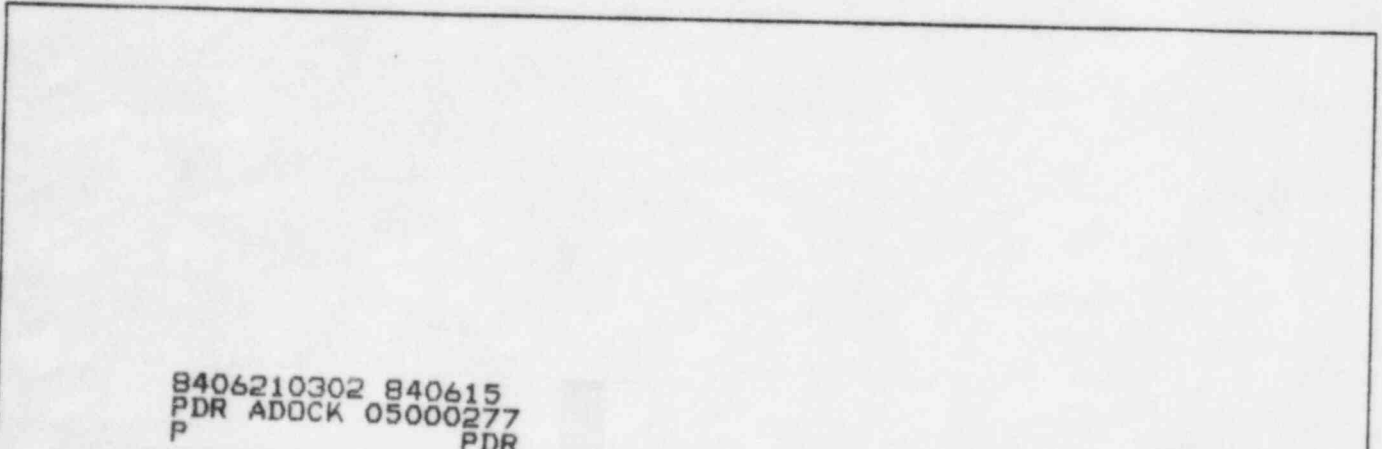
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| IDENTIFICATION     | SI# 8       |
| REV. NO.           | 2           |
| CONTRACT           | 34540       |
| PAGE NO. 1 OF 23   |             |
|                    | BY DATE     |
| PREPARED           | GEC 3/19/84 |
| CHECKED            | CLH 3/22/84 |
| REVISED            | CLH 5/8/84  |
| AUTHORIZED         | KMW 5/9/84  |
| REFERENCE STANDARD | REV. NO.    |

|          |  |           |           |         |              |            |  |  |  |  |
|----------|--|-----------|-----------|---------|--------------|------------|--|--|--|--|
| TITLE    | MOCK-UP DEMONSTRATION AND TRAINING INSTRUCTION           |           |           |         |              |            |  |  |  |  |
| PRODUCT  | BWR RECIRCULATION PIPING REPLACEMENT PEACH BOTTOM UNIT 2 |           |           |         |              |            |  |  |  |  |
| REVIEWED | OB ENGR  | DIST ENGR | CORP VELD | CORP QA | REG CONST QA | REF MFG QA |  |  |  |  |
|          |  |           |           |         |              |            |  |  |  |  |

1.0 SCOPE:

Extensively revised.

- 1.1 This instruction covers the operations that (1) require a procedure/equipment "Mock-up Demonstration" and (2) personnel training. The term "Mock-up Demonstration" means to use simulated plant conditions to demonstrate the acceptability of a procedure and equipment to perform an operation. The term "Mock-up Training" means to use the same physical "mock-up" to train personnel to perform the operation. The mock-up will demonstrate successful performance of procedures, equipment and personnel prior to doing the actual operation in the plant. If necessary additional training of personnel to familiarize them with the operation can be done as outlined herein. This will subsequently reduce exposure and critical path time.
- 1.2 The Mock-up Demonstrations identified by CBI as being necessary for each operation requiring mock-ups are:
  - 1.2.1 Temporary Supports for Pipe Removal - The installation of supports at the recirculation isolation valves. (MO53-A or B and MO43-A or B)



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1.2.2 Cutting Operation for Pipe Removal

1.2.2.1 Mechanical cutting will be demonstrated on mock-ups of:

- a) Suction Line to the N-1 nozzle safe end removal.
- b) Discharge line elbow to the N-2 nozzle safe end removal.
- c) Suction inlet of the recirculation pump.
- d) Outlet/inlet of valves and recirculation pump outlet. One mock-up will cover all three (3) locations providing same machine set-up is used.
- e) RHR suction elbow to N-12 20" penetration.
- f) RHR return elbow to N-13B 24" penetration.

1.2.2.2 Plasma-Arc cutting will be demonstrated on a mock-up of a horizontal (2G) cut and vertical (5G) cut.

1.2.3 Method of Monitoring Nozzle Loading During Pipe Removal

The correct application of supports and rigging as required in SI# 3 and # 4 for removal of spools for decon and subsequent removal operations, will eliminate any potential for excessive nozzle loadings.

1.2.4 Weld Preparation Made In Place - the machining of weld edge preparation on the N-1 nozzle, the N-2 nozzle, the Recirculation Pump Inlet Nozzle, the N-12 and N-13B penetrations.

1.2.5 Pipe Joint Fit-up - Butt weld joints at the N-1 nozzle, the N-2 nozzle, and the Recirculation Pump Inlet Nozzle.

1.2.6 Welding Equipment Set-up and Welding Procedure Implementation  
Butt weld joints at the N-1 nozzle, the N-2 nozzle and set-up of equipment and weld root at the Recirculation Pump Inlet Nozzle.

1.2.7 Closure Spool Templating and Fit-up - Mock-up of closure pieces at the N-1 nozzle and the N-2 nozzle.



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1.2.8 Special Access or Special Method NDE - Code, customer and in-house NDE examination will be performed on the welded mock-ups at N-1 and N-2 nozzle described in 1.2.6. In addition, mock-ups may be made on an as needed basis for specific activities as construction progresses and when the use of a mock-up will be considered an asset during the actual performance of the activity in the plant.

- 1.3 Mock-ups can also be used for experimenting with different set ups, techniques and procedures in order to achieve maximum efficiency for each operation.
- 1.4 If desirable from a mock-up schedule standpoint, the same mock-up may be used for several operations. For example, the mock-up for the N-1 nozzle may be used for operations in sequence such as cutting for pipe removal, weld edge preparation, templating and joint fit-up welding, NDE etc., providing all requirements are completed for each operation.
- 1.5 Personnel successfully performing the "mock-up demonstration" for the procedure and equipment will have successfully completed their "mock-up training" and the person's "record of mock-up training" can be completed.
- 1.6 If training of additional personnel is required, successful completion of any one operation can be accomplished without going through the complete sequence of all operations.

## 2.0 REFERENCES:

- 2.1 GE Specification 23A4044 "Recirculation and Residual Heat Removal System Piping Replacement".
- 2.2 CBI Contract QA Handbook for Project 34540 containing procedures referenced within this instruction.
- 2.3 CBI Contract Drawings and Erection (ER) Drawings.
- 2.4 CBI Special Instructions - SI# 1, SI #3, SI# 4, SI# 5, SI# 6, SI# 7, SI# 9, SI# 10 and SI# 11.



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3.0 RESPONSIBILITIES:

3.1 The Project Superintendent is responsible for:

3.1.1 Implementing these instructions through jobsite personnel as required.

3.1.2 Completing "Mock-up Demonstrations" in strict accordance with this instruction, and assigning only personnel qualified through "mock-up training" demonstrations to operations which require the prior mock-up demonstration and training.

3.2 The Project Welding and QA Superintendent is responsible for:

3.2.1 Assuring that requirements of this instruction are being properly implemented at all times.

3.2.2 Maintaining and reviewing all documentation associated with this instruction.

4.0 GENERAL REQUIREMENTS FOR ALL MOCK-UPS

4.1 The mock-up for each item as described in this instruction shall include all operation ranges, variables and positions, equipment modifications and set-ups, changes to fixtures, equipment, tools or supports to be utilized. This is accomplished by following the referenced procedures, i.e., welding procedures, cutting procedure etc.

4.2. The mock-up shall simulate actual radiological and access conditions including necessary protective clothing and breathing equipment as well as existing constraints which may affect the operations being performed inside the drywell. All equipment, tools, supports, and other aids that are planned to be used on the actual job, shall be used on the mock-up.

4.3 Large pieces of equipment or other components may be simulated (space framed) where it is impractical to mock them up because of characteristics such as size, weight, or excessive detail.

4.4 For operations where the type of material can affect the performance of the job, i.e., cutting, machining and welding, the material shall be the same type as used in the plant. As an alternate, type 304 or 304L may be used for stainless steel and type A53 or equivalent will be used for carbon steel. Drawings of mock-ups will indicate the material used.



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- 4.5 Any lubricants or other process materials planned for use during the job shall be the one used during mock-up performance qualification and shall be selected from those in Special Instruction SI #9.
- 4.6 Temporary supports and rigging on the mock-ups shall be as shown on the CBI Erection (ER) Drawings so that it will simulate actual conditions in the work area.

5.0 MOCK-UP DEMONSTRATION FOR TEMPORARY SUPPORTS

- 5.1 Assemble temporary supports on a mock-up of the recirculation isolation valves as shown on Erection Drawings ER 6 or ER 19.
- 5.2 Set up the mock-up valve in the CBI Fab Shop with access conditons identical to those inside the plant. Install two dial indicators on the valve flanges to record movement.
- 5.3 Maneuver the valve support under the mocked up valve and use the support's jacking devices to secure the temporary frame to the valve body.
- 5.4 Adjust all support until the dial indicators move 2 mils (.002). Guy off valve bonnet or flange as required to hold the valve in position and prevent tipping.
- 5.5 Demonstrate how adjustments to valve levelness and plumbness can be made using the adjustable supports. Also demonstrate how the valve will slide on the Flourogolds pads.

6.0 MOCK-UPS DEMONSTRATING CUTTING FOR PIPE REMOVAL:

6.1 Machine Cutting At N-1 Nozzle:

- 6.1.1 Set-up in the CBI Fab Shop the mock-up of the N-1 nozzle and pipe as shown on Erection Drawing ER 39, including simulated plant access conditions.
- 6.1.2 Layout both cut locations for piece #20 on the mock-up per Erection Drawing ER 302 and Cutting Procedure CT1N.
- 2 6.1.3 Set-up MCI-18-30 equipment and cut the pipe from the safe end following the machine cutting procedure in CT1N.





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- 6.1.4 Move machine to second cut line at elbow and set up for cutting.
- 6.1.5 Connect the temporary rigging on Piece # 20 as shown on Erection Drawing ER 102.
- 6.1.6 Machine sever second end of Piece # 20 per CT1N and remove from mock-up.
- 6.1.7 Demonstrate debris (chips, lubrication, etc.) can be removed.
- 6.2 Machine Cutting at N-2 Nozzle:
  - 6.2.1 Set-up in the CBI Fab Shop a mock-up of the N-2 nozzle and pipe as shown on Erection Drawing ER 38, including simulated plant access conditions.
  - 6.2.2 Attach temporary supports in place as shown on Erection Drawing ER 102 for Discharge Riser Elbow removal.
  - 6.2.3 Layout the upper and lower cut line locations on mock-up per Erection Drawing ER 303 and Cutting Procedure CT1N.
  - 2 6.2.4 Set-up MCI 6-16 equipment and cut the pipe at the safe end first following the machine cutting procedure in CT1N. Sever the second end of closure pipe and remove the elbow section.
  - 6.2.5 Demonstrate all debris (chips, lubricants) can be removed.
- 6.3 Machine Cutting at Pump Inlet:
  - 2 6.3.1 Set up in the CBI Fab Shop the mock-up of the pump inlet as constructed from GE original drawings, including simulated plant access conditions. See CBI Drawings ER 90, 91 and 92.
  - 6.3.2 Layout cut location on piece 15 per CBI drawing 6 and cutting Procedure CT1N.



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- 2 6.3.3 Set-up MCI-32-42 machine on pump body and cut pipe from inlet nozzle following the machine procedure in CT1N.
- 6.3.4 Demonstrate all debris (chips, lubrications etc.) can be removed from pump.

6.4 Machine Cutting for Recirculation Isolation Valves

- 2 6.4.1 Set up in the CBI Fab Shop the mock-up of the valve nozzle as constructed from GE original drawings, including simulated plant access conditions. See CBI ER Drawings ER 94.
- 6.4.2 Layout cut location on the pipe per CBI drawing 6 and cutting Procedure CT1N.
- 2 6.4.3 Set-up MCI-18-30 machine on valve body and cut pipe from nozzle following the machining procedure in CT1N.
- 6.4.4 Demonstrate all debris (chips, lubricants etc.) can be removed from valve.

6.5 Machine Cutting at N-12 Penetration

- 6.5.1 Set up in the CBI Fab Shop the mock-up of the N-12 penetration and pipe as shown on Erection Drawing ER 21, including simulated plant access conditions.
- 6.5.2 Layout both cut locations for piece # 37 on the mock-up pipe ER 305 and cutting Procedure CT1N.
- 2 6.5.3 Set up MCI-18-30 or MCI-32-42 equipment and cut the pipe from the penetration following the Machining Cutting Procedure in CT1N.
- 6.5.4 Move machine to second cut line and set up for cutting.
- 6.5.5 Connect the temporary rigging to Piece # 37.
- 6.5.6 Machine sever second end of Piece # 37 per CT1N and remove from mock-up.
- 6.5.7 Demonstrate all debris can be removed from penetration and valve.



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6.6 Machine Cutting at N-13 Penetration

- 6.6.1 Set up in CBI Fab Shop the mock-up of the N-13B penetration and pipe as shown on Erection Drawing ER 21, including simulated plant access conditions.
- 6.6.2 Layout both cut locations for piece # 41 on the mock-up per ER 304 and Cutting Procedure CT1N.
- ② 6.6.3 Set up MCI-18-30 or MCI-32-42 equipment and cut the pipe from the penetration following the Machine Cutting Procedure in CT1N.
- 6.6.4 Move machine to second cut line and set up for cutting.
- 6.6.5 Connect the temporary rigging to Piece # 37.
- 6.6.6 Machine sever second end of Piece # 37 per CT1N and remove from mock-up.
- 6.6.7 Demonstrate all debris can be removed from the penetration.

6.3 Plasma Arc Cutting in 2G and 5G positions

- 6.3.1 Using sections of stainless steel pipe, set up 2G and 5G mock-ups in the CBI Fab Shop.
- 6.3.2 Layout cuts, drill starting hole, install containment boxes detailed on Erection Drawings ER 12 and ER 13. Make cuts per Procedure CT1N.
- 6.3.3 After cutting, cap pipe ends with covers.

7.0 MOCK-UPS DEMONSTRATING MACHINING WELD EDGE PREPS IN PLACE

7.1 Machining weld edge prep on N-1 nozzle safe end.

- 7.1.1 Set up a mock-up of just the N-1 nozzle and safe end as shown on CBI drawing ER 39 and include mock-ups of access restrictions which exist in the plant.





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- 7.1.2 Layout the final weld edge prep cut line on the safe end in accordance with CBI Drawings 6 and Special Instruction SI# 10.
- 7.1.3 Check safe end inside diameter and determine the proper counter bore diameter to machine per SI# 10.
- 2 7.1.4 Mount MCI-18-30 machining equipment and machine the weld edge prep on the safe end in accordance to CBI Drawing # 11, Detail J.
- 7.1.5 After machining and clean-up per SI# 10, check weld prep edge dimension, including minimum wall thickness and record.
- 7.1.6 PT final weld edge prep per Procedure PT14X.
- 7.2 Machining weld edge prep on N-2 nozzle safe end
  - 7.2.1 Set up a mock-up of just the N-2 nozzle and safe end as shown on CBI drawing ER 38 and include any mock-up of access restrictions which exist in the plant.
  - 7.2.2 Layout the final weld edge prep cut line on the safe end in accordance with CBI drawing 6 and Special Instruction SI# 10.
  - 7.2.3 Check safe end inside diameter and determine the proper counter bore diameter to machine per SI #10.
  - 2 7.2.4 Mount MCI-6-16 machining equipment and machine the weld edge prep on the safe end in accordance to CBI drawing # 11, Detail T.
  - 7.2.5 After machining and clean-up per SI# 10, check weld prep edge dimension, including minimum wall thickness and record.
  - 7.2.6 PT final weld edge prep per Procedure PT14X.
- 7.3 Machining of weld edge prep on Recirculation Pump Inlet Nozzle.
  - 2 7.3.1 Set-up a mock-up of the recirculation pump inlet nozzle including any access conditons that exist under the pump. See CBI ER drawings ER 90, 91 and 92.



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- 7.3.2 Layout the final weld edge prep cut line on the pump inlet in accordance with CBI drawing 6 and Special Instruction SI# 10.
- 7.3.3 Check pump inlet inside diameter and determine proper counter bore diameter to machine per SI# 10.
- 7.3.4 Mount MCI 32-42 machining equipment and machine the weld edge prep on the pump in accordance to CBI Drawing 11, Detail W and SI# 10.
- 7.3.5 After machining and clean-up per SI# 10, check weld prep edge dimension, including minimum wall thickness and record.
- 7.3.6 PT final weld edge prep per Procedure PT1N.

8.0 MOCK-UP DEMONSTRATIONS FOR PIPE JOINT FIT-UPS

- 8.1 The pipe joints identified as requiring a mock-up for joint fit-up in 1.2.5 will each be done following the specific sequence in 8.2 below. The following list identifies which Contract Drawings (including weld procedure, joint number and weld detail) and mock-up arrangement will be used when performing each demonstration.
  - 8.1.1 N-1 Nozzle - Use Contract Drawings # 8, 9 and 11 and the mock-up arrangement on Erection Drawing ER 39. Covers actual butt weld joints numbers 001 Loop "A" and 048 Loop "B".
  - 8.1.2 N-2 Nozzle - Use Contract Drawings # 8, 9 and 11, and the mock-up arrangement on Erection Drawing ER 38. Covers actual butt weld joints # 036, #038, #040, #047, #044 on Loop "A", and # 078, #080, #082, #086 and #088 on Loop "B".
  - 8.1.3 Recirculation Pump Inlet Nozzle - Use Contract Drawings #8, #9 and # 11, and a pump mock-up arrangement simulating actual plant conditions. Covers actual butt weld joints #022 on Loop "A" and #064 on Loop "B".



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8.2 Typical Pipe Joint Fit-up Sequence

- 8.2.1 Remove shielding from inside nozzles per Special Instructions SI# 5 and SI# 6.
  - 8.2.2 Clean inside of pipes of all debris and solvent clean both edge preps and consumable insert using CP1N. Visually examine prior to fit up per VT-1X or VT-1N whichever is applicable.
  - 8.2.3 Fit purge dam(s) on either side of the butt weld joint as planned for the applicable joint.
  - 8.2.4 Mark location of weld edge preps per Procedure MP-1.
  - 8.2.5 Tack weld consumable insert to one weld end prep per applicable welding procedure.
  - 8.2.6 Using fit up clamps, fit the mockup butt joint together per applicable contract drawing within VT1X or VT1N required tolerances. Tack weld consumable insert to adjoining pipe weld edge prep. If necessary, establish purge and consume insert to hold joint together.
  - 8.2.7 Remove fit-up clamps and check final fit-up for required tolerances per the Contract Drawing and visual inspection procedure VT1X or VT1N as applicable.
- 8.3 All mock-up demonstrations for fitting operations will be supervised by CBI Welding Technicians and Welding QA Supervisors as will be the case during actual installation work.

9.0 MOCK-UP DEMONSTRATIONS FOR WELDING EQUIPMENT SET-UP AND WELDING PROCEDURE IMPLEMENTATION.

- 9.1 The N-1 safe-end to pipe joint and N-2 safe-end to pipe joint will both follow the sequence outlined in 9.2 below. For the Recirc Pump Inlet Nozzle joint, only sequences 9.2.1, 9.2.2 and 9.2.3 are to be completed. The welding mock-up demonstrations will follow the same applicable contract drawings and mock-up drawings referenced for fit-up in Section 8.0.



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9.2 The mock-up demonstrations for welding will begin after a joint has been accepted for fit-up per 8.2.7 and will be sequenced as follows:

9.2.1 Set-up and align welding equipment on butt weld joint per manufacturer's instructions. Set-up punch marks around pipe to measure shrinkage. Utilize existing "V" marks from MP-1 where possible.

9.2.2 Establish purge at weld joint per welding procedure.

9.2.3 Consume the insert into the weld edge preps per welding procedure.

9.2.4 Deposit root weld passes at least a minimum of three passes or  $1/3 t$  whichever is greater, per the WPS.

9.2.5 Perform 100% root weld radiography of the root layers.

9.2.6 Remove purge dam(s) from pipe at the joint area. (This may be done after completion of weld per 9.2.4).

9.2.7 Continue welding the remainder of the butt joint per applicable WPS.

9.2.8 Complete, grind and prepare weld outside surface for final NDE. The final surface will be prepared in accordance with visual inspection procedure VT1X and contract drawings.

9.2.9 Perform final weld radiography. (See section 11.0 for NDE mock-up demonstrations).

9.2.10 Perform a liquid penetrant examination test per PT14X.

9.3 Mock-Up of Open Root Repairs

9.3.1 The mock-up demonstration of open root repair will follow the guidelines in GR32X.

9.3.2 Using sections of stainless steel pipe welded per the required WPS Procedure, set up 2G and 5G mock-ups in the CBI Fab Shop.



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- 9.3.3 Using the methods in GR32X, cut an open root hole approximately 1 inch long to the proper configuration in GR32X. Evaluate amount of debris falling into pipe and vacuum out using a small diameter tubing.
  - 9.3.4 Establish purge and weld up the root per approved welding procedure.
  - 9.3.5 Perform root weld radiography of the repair.
  - 9.3.6 Remove purge dams from pipe at joint area, if not water soluble. Purge dams may remain until after welding if desirable.
  - 9.3.7 Continue welding out joint per applicable WPS.
  - 9.3.8 Complete, grind and prepare outside weld surface for final NDE. The final surface shall be prepared according to VT1X and contract drawings.
  - 9.3.9 Perform final radiography.
  - 9.3.10 Perform a liquid penetrant examination per PT14X.

10.0 MOCK-UP DEMONSTRATION FOR TEMPLATING, AND FIT-UP OF CLOSURE SPOOLS

10.1 N-1 Nozzle to Suction Line Closure Spool

- 10.1.1 Use the N-1 mock-up on CBI drawing ER 39. Remove riser elbow section for starting point.
- 10.1.2 Template the N-1 mock-up closure piece as outlined in Special Instruction SI#11 using the templating jigs outlined on ER 30 thru ER 33.
- 10.1.3 Transfer the template to the machining jig on drawing ER 35 setting the required dimensions using the adjustments per instructions on the drawing and SI#11.





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- 10.1.4 Take the N-1 mock-up closure spool with approximately four inches of trim each end and machine the N-1 closure spool mock-up to the correct size per SI# 11, SI# 10, and Drawing ER 35.
- 10.1.5 Place the completed N-1 closure spool piece on the N-1 mock-up and check to see if the spool can be fit within permitted cold pull tolerances taking weld shrinkages into consideration and meet VTI requirements.

10.2 N-2 Nozzle to Discharge Riser Closure Spool

- 10.2.1 Use the N-2 mock-up on CBI Drawing ER 38. Remove riser elbow section for starting point.
- 10.2.2 Template the N-2 mock-up closure piece as outlined in Special Instruction SI# 11 using the templating jig and instructions on CBI Drawings ER 30 thru ER 33.
- 10.2.3 Transfer the template to the machining jig on drawing ER 35 using the instructions on drawing ER 35 and SI# 11.
- 10.2.4 Take the N-2 mock-up closure riser with approximately four inches of trim on each end and machine the N-2 closure spool mock-up to the correct size per SI# 11, SI# 10, and drawing ER 35.
- 10.2.5 Place the completed N-2 closure piece on the N-2 mock-up and check to see if the completed N-2 closure spool can be fit within permitted cold pull tolerances taking weld shrinkage into consideration and meet VTI requirements.

11.0 SPECIAL ACCESS OR SPECIAL METHOD NDE MOCK-UP DEMONSTRATIONS

11.1 Radiography of N-1 and N-2 Safe End to Pipe Joint Root Welds

- 11.1.1 Radiograph 100% of the completed root welds on the N-1 and N-2 Nozzle mock-ups using RT9X and the techniques to be used in the drywell.



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11.2 Radiography of N-1 and N-2 Safe-End to Pipe Joint Complete Welds

11.2.1 Radiography 100% of the completed welds on the N-1 and N-2 Nozzle mock-ups using RT9X and the techniques to be used in the drywell.

11.3 Visual Examination of N-1 and N-2 Safe-End to Pipe Joint Completed Welds

11.3.1 Visually examine 100% of the completed welds on the N-1 and N-2 Nozzle mock-ups using VT1X.

11.4 Liquid Penetrant Examination of N-1 and N-2 Safe End to Pipe Joint Completed Welds

11.4.1 Liquid penetrant 100% of the completed welds on the N-1 and N-2 Nozzle mock-ups using PT14X.

11.5 As the installation work progresses, special access situations in addition to those mock-up demonstrations outlined above may arise. In order to demonstrate and assure successful performance in these situations, additional mock-ups may be made for training purposes so that critical path and exposure times will be minimized. It will not be mandatory to add those additional training mock-ups to this instruction.

12.0 ACCEPTANCE CRITERIA AND DOCUMENTATION OF MOCK-UP DEMONSTRATIONS

12.1 Each known mock-up shall be conducted in strict accordance with this instruction with no added precautions or operations which will not, or cannot be used in the actual removal or installation operation. The successful acceptance of each mock-up shall be as indicated within this section.

12.2 In the event that some mock-up demonstrations are performed by a group of people, the group will be considered acceptable to perform that operation based upon successful completion of the mock-up. Exceptions to this will be actual welding, machining, and NDE operators. In this case only that individual will be noted as qualified to be the operator. Supporting personnel can be documented as the support group and can support other operators.



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- 12.3 Minor revisions to procedures, instructions, drawings, etc. to which mock-ups were performed will not constitute a reason for requalification of those personnel involved. Only major changes such as equipment modification or substitution, piping design revisions or process changes will be considered a reason to requalify personnel on the mock-up.
- 12.4 ALARA principles, including time, must be considered a factor when evaluating the operators mock-up performance. The operation must be completed within a reasonable amount of time as determined by an ALARA evaluation.
- 12.5 Acceptance Criteria for "Mock-up Demonstrations" of procedures and equipment to be successfully completed are listed below. The criteria for "Mock-up Training" for personnel are listed in the columns on the right showing whether the activity must be completed individually or in a group. Those items completed individually are to be done by each crew in its entirety. The other items done by group, such as welding and cutting, can have one operation completed by several crews, each doing a fraction of the job (i.e. 1/3, 1/2).

|        | <u>Mock-Up Demonstration</u>  | <u>Mock-up Training</u> |                   |
|--------|---|-------------------------|-------------------|
|        |   | <u>Group</u>            | <u>Individual</u> |
| 12.5.1 | <u>For temporary supports (Section 5.0)</u>                                       |                         |                   |
|        | 1) The valve support is installed per drawing ER 6 or ER 19 as applicable         |                         | X                 |
|        | 2) Demonstrate capability to level and plumb valve using support adjustments      |                         | X                 |
|        | 3) Install support in a timely manner acceptable to schedule and ALARA principles |                         | X                 |
|        | 4) Supported correctly by moving dial indicators 2 mils to a maximum of 10 mils   |                         | X                 |



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Mock-Up Demonstration

Mock-up Training  
Group Individual

5) Demonstrate valve will move laterally for weld shrinkage

X

12.5.2 For Cutting of Pipe for Removal  
(Section 6.0)

1) Layout completed per applicable CBI drawing.

X

2) Cut made in accordance with Procedure CT1N

X

3) Set-up equipment correctly and operated equipment in accordance with instructions.

X

4) Completed mock-up demonstration in a time acceptable to schedule and ALARA principles.

X

5) For plasma cutting, operated plasma torch and drill correctly and set-up containment box per drawing ER 12 and ER 13.

X

6) Cut accurately with cut line with no violation of cut line toward reused components.

X

7) All debris (chips, lubricants) can be easily removed from reused components.

X



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Mock-Up DemonstrationMock-up Training  
Group Individual12.5.3 For Machining Weld Edge Preps in Place  
(Section 7.0)

- |   |   |   |
|---|---|---|
| 1) Layout of final weld prep location made correctly.   |   | X |
| 2) Machined prep within requirements of SI# 10.   | X |   |
| 3) Weld edge prep completed within the dimensional tolerances and finish on applicable contract drawings and and passed PT examination. Perpendicular to axis of pipe within + 1/32 inch. | X |   |
| 4) Set-up and removed equipment properly.   |   | X |
| 5) Completed operation in a duration acceptable to schedule and ALARA principles.   | X |   |
| 6) Cut accurately with final cut line with no violation of cut line toward reused component.  | X |   |
| 7) All debris (chips, lubricants) can be easily removed from reused components.   | X |   |

12.5.4 For Pipe Joint Fit-up (Section 8.0)

- |  |  |   |
|--|--|---|
| 1) Joints were fit within tolerances on contract drawings and procedure VT-1X or VT1N as applicable. |  | X |
| 2) Fit up sequence completed per instructions.   |  | X |





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Mock-Up Demonstration

Mock-up Training  
Group Individual

- 3) Completed operation in a duration acceptable to schedule and ALARA principles.

X

12.5.5 For Pipe Joint Welding (Section 9.0)

- 1) Equipment set-up properly.
- 2) Interpass temperature not exceeded.
- 3) Proper interpass cleaning completed.
- 4) Welding parameters followed as shown in the WPS.
- 5) Heat input controlled properly.
- 6) Weld shrinkage not excessive.
- 7) Root weld radiography acceptable.
- 8) Visual inspection on final weld surface acceptable. VT1X or VT1N as applicable.
- 9) Liquid penetrant inspection per PT14X on final weld surface acceptable.
- 10) 100% radiography of completed weld acceptable to PT9X.
- 11) Recorded heat-input properly.
- 12) Followed ALARA principles during operation.

X

X

X

X

X \*

X

X

X \*

X

X

\* The acceptance standards for the radiographys covering "Mock-up Training" will permit minor defects per the Welding QA Supervisor's evaluation. The cause for the minor defect must be known and understood by the welder to be an acceptable minor defect.



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Mock-Up Demonstration

Mock-up Training  
Group Individual

12.5.4 For Templating and Fit-up of Closure Spools (Section 10.0)

- 1) Followed SI# 11 and CBI Drawings correctly.
- 2) The closure piece fit within cold pull tolerances and other VTI requirements.

X

X

12.5.7 For Special Access of Special Method NDE (Section 11.0)

- 1) Root radiography acceptable.
- 2) Followed RT9X procedure correctly, shown in the WPS.
- 3) Radiographs of completed weld acceptable.
- 4) Possible to visual examine 360° weld surface and followed VTI correctly.
- 5) Possible to liquid penetrant examine 360° weld surface and follow PT14X correctly.

X

X

X

X

X

12.6 After completion of each Mock-up Demonstration, the form on page 22 will be completed and maintained by the jobsite QA personnel.

This form will list the procedures and equipment demonstrated as well as any process materials used to complete the operation.

Individuals who have successfully completed "Mock-up Training" per this instruction will be listed on the form on page 23. The form will be signed by the person(s) conducting the "Mock-up Training" per this instruction and will describe the operation for which the person(s) was trained.



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12.7 A master list will be kept by jobsite QA listing those individuals who have successfully completed each operation requiring "Mock-up Training".

13.0 QAM DOCUMENTATION

13.1 Sign-off on the "field Checklist" or Travelers" shall be completed to document that mock-up demonstrations were completed in accordance with this special instruction.

13.2 Record of "Mock-up Demonstrations" and "Mock-up Training" completed for those operations requiring mock-ups.



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RECORD OF MOCK-UP DEMONSTRATION

DESCRIPTION OF MOCK-UP DEMONSTRATION ACTIVITY \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DATE OF MOCK-UP DEMONSTRATION \_\_\_\_\_

DURATION OF MOCK-UP DEMONSTRATION \_\_\_\_\_

PERSONNEL IN ATTENDANCE AND WHO HAVE SUCCESSFULLY DEMONSTRATED BY MOCK-UP THEIR ABILITY TO PERFORM THE REQUIRED OPERATIONS

|       |       |       |
|-------|-------|-------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

PERSONNEL CONDUCTING THE MOCK-UP DEMONSTRATION

|       |       |       |
|-------|-------|-------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

PROCEDURES, DRAWINGS, ERECTION DRAWINGS, ETC. COVERED DURING MOCK-UP DEMONSTRATION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ACCEPTED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 SUPERVISOR OF MOCK-UP DEMONSTRATION

REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 PROJECT SUPERINTENDENT

REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 PROJECT WELDING & QA SUPERINTENDENT

\* Operator



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RECORD OF PERSONNEL MOCK-UP TRAINING

DESCRIPTION OF MOCK-UP TRAINING ACTIVITY \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DATE OF MOCK-UP TRAINING \_\_\_\_\_

DURATION OF MOCK-UP TRAINING \_\_\_\_\_

PERSONNEL IN ATTENDANCE AND WHO HAVE SUCCESSFULLY DEMONSTRATED BY MOCK-UP THEIR ABILITY TO PERFORM THE REQUIRED OPERATIONS

|       |       |       |
|-------|-------|-------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

PERSONNEL CONDUCTING THE MOCK-UP TRAINING  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROCEDURES, DRAWINGS, ERECTION DRAWINGS, ETC. COVERED DURING MOCK-UP TRAINING:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ACCEPTED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 SUPERVISOR OF MOCK-UP TRAINING

REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 PROJECT SUPERINTENDENT

REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 PROJECT WELDING & QA SUPERINTENDENT

\* Operator