

DESCRIPTION

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CAROLINA POWER & LIGHT COMPANY
 SHEARON HARRIS NUCLEAR POWER PLANT

WORK PROCEDURE
 WP-141

JAN 29 1985 Rev.

DOCUMENT CONTROL

RECEIVED
 FEB 15 1984
 REGULATED

SHEARON HARRIS N. P. P.

B.II. This is
 The walkdown
 procedure. See
 checklist for
 Temp. Hrs
 A115

* * REVIEWED BY QA/QC FOR COMPLIANCE WITH THE APPLICABLE QA AND CODE REQUIREMENTS.

* REVIEWED AND APPROVED BY EBASCO SERVICES, INC., FOR CONFORMANCE TO THE REQUIREMENTS
 OF PARAGRAPH CA-3310 OF ARTICLE CA-3100 OF ASME/ACI 359, SECTION III, DIV 2, WINTER
 1975 ADDENDA.

REV.	DESCRIPTION	APPROVALS		DATE
0	Issued For Use.	ORIGINATOR	<i>[Signature]</i>	2/2/85
		CONSTRUCTOR	<i>[Signature]</i>	2-9-85
		QA/QC REVIEW * *	<i>[Signature]</i>	2/10/85
		CP&L	<i>[Signature]</i>	2-13-85
		DES. ENG. *	NA/EEW	
1	Major Rewrite. Added Exhibits 1-8 and Appendix A.	ORIGINATOR	<i>[Signature]</i>	1-25-85
		CONSTRUCTOR	<i>[Signature]</i>	1/25/85
		QA/QC REVIEW * *	<i>[Signature]</i>	1/25/85
		CP&L	<i>[Signature]</i> f.r RMP	1/28/85
		DES. ENG. *	N/A f.r RMP	1/28/85
		ORIGINATOR		
		CONSTRUCTOR		
		QA/QC REVIEW * *		
		CP&L		
		DES. ENG. *		

1.0 SCOPE

- 1.1 This procedure provides directions for obtaining and transmitting "As Constructed" pipe information to HPES for the reconciliation of the system stress analysis.
- 1.2 This procedure is applicable to all seismically analyzed piping systems as shown on the Ebasco Stress Isometrics.
- 1.3 This is an ASME Section III procedure.
- 1.4 Portions of this procedure are for compliance to IEB 79.14.

2.0 REFERENCES

- 2.1 NRC Bulletin 79.14 Rev. 2
- 2.2 WP-110, Installation of Pipe Hangers and Supports for Seismically Analyzed Pipe
- 2.3 WP-102, Installation of Pipe
- 2.4 WP-142, Training and Qualification of Field Engineering Personnel
- 2.5 TP-25, Training of Supervisory and Technical Personnel in Implementation of ASME - N-Stamp Program

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3.0 GENERAL

3.1 Definitions/Abbreviations

1. As-Built - (AB) - A FI which has had all known design incorporated into it. (ie FCR's, DCN's, PSFM's, ICR's, etc.)
2. As-Constructed (AC) - A FI which has been revised or marked up by Field Engineering (survey) to reflect the condition (i.e. dimensions, angles, components) which exist in the field. (This drawing meets the As Constructed Drawing Definition of ASME Section III subsection NA Paragraph 4133.17(e)).
3. Discrepancy - A "Discrepancy" is a deviation from design, (As-Built Drawing), other than dimensions shown on Fab Iso's.

A95

- 3.1 Iso. (FI) - A drawing used by piping craft for pipe installation. This drawing may show only a portion of a system or line. It is generated from a design drawing.
5. Final Hanger Turnover (FHT) - The turnover of control/authority of hangers in a system over to Start-Up.
6. Release For Turnover (RFT) - A numerically designated portion of a system. An RFT is turned over to start-up when all pipe work within the boundaries of the RFT is complete, and the permanent supports required for flush and hydro are installed.
7. Roll-Up (RU) - A hanger drawing which has had the outstanding construction or design documents incorporated into it (i.e. Field Mod's, FCR's, and DCN's)
8. Stress Calc. (SC) - Used to describe a piping system between anchor points on the pipe for which the stress on the pipe is determined analytically.

3.2 Forms Guidelines

1. Stress Calculation Freeze Notice

As directed by the 79.14 supervisor, a Stress Calculation Freeze Notice (Exhibit 1), shall be issued to HPES (Pipe), Pipe and Hanger Managers. The Stress Calculation Freeze Notice specifies/directs the following:

1. Specifies the Stress Calculation Number.
2. Specifies the Fab Iso affected.
3. Directs that no work due to FCR's or DCN's shall be performed prior to the change being incorporated on the Fab Iso.
4. Directs that no work will be performed prior to the completion of a Pipe Work Authorization form.

NOTE: Remaining hanger work is unaffected by this notice.

"Walkdown Checklist" (PWC), (Exhibit 2), provides a record of the walkdown and the pipe attributes checked.

3. Hanger Walkdown Checklist

The "Hanger Walkdown Checklist" (HWC), (Exhibit 3), provides a record of the walkdown and the hanger attributes checked.

4. 79.14 Open Items Tracking List

The 79.14 Open Items Tracking List (79.14 OITL), (Exhibit 4), provides a means to record discrepancies found during the walkdown and track them to closure.

5. Analysis Data Sheet

Analysis Data Sheet, (Exhibit 5), is used to record data found during the walkdowns (pipe or hangers) that is pertinent to stress analysis or which has been requested by HPES.

1. Pipe clearances less than those specified in Paragraph 3.3.2.3 will be recorded on the Analysis Data Sheet.

6. Stress Calc Index Sheet

The Stress Calc Index Sheet, (Exhibit 6), is placed in the walkdown package to inventory the Fab Iso's and hanger drawings, and to tabulate accepted installations.

7. Pipe Work Authorization

The Pipe Work Authorization (PWA), Exhibit 8, is generated by pipe engineering to provide specific work boundaries to the 79.14 supervisor which may need to be reprocessed by this procedure. Work may not proceed until the PWA has been signed by the 79.14 supervisor.

3.3. General Guidelines

1. The 79.14 supervisor will obtain the Fab Iso revision # containing the As-Built data from HPES (As Built) and have 4 copies made by Document Control. These copies will be distributed as follows:
 1. 1 For Pipe Walkdown package
 2. 1 For Hanger Walkdown package
 3. 2 For Survey (Field Engineering)

3.3

The Walkdown shall verify the following:

The piping configuration is in accordance with the As-Constructed Fab Iso.

2. The operational envelope is not violated in accordance with the following criteria:

$T > 200^{\circ}\text{F}$: along run: 2" +insulation. @ sleeves: 1" +insulation

$T \leq 200^{\circ}\text{F}$: along run: 1" + insulation. @ sleeves: $\frac{1}{2}$ " +insulation

3. That the fittings & bends installed are of the same size and type shown on the Rolled-Up Fab. Iso.
4. That the valve identification number is that shown on the As-Built Fab Iso.
5. That the valve operator is oriented in accordance with the Rolled-Up Fab. Iso.
6. That temporary supports have been removed.
3. The Hanger Walkdown will verify:
 1. That there are no visible signs of tampering.
 2. That gravitational supports are taking the load.
 3. That there are no operational obstructions based on postulated pipe movement.
4. The Field Engineers will survey each piping system, as directed. The survey will establish several working points on the piping system to verify piping geometry, and verify slope when called for on the F.I. In addition, the survey will locate each of the following items on the Fab Iso. relative to the pipe:
 1. Fittings
 2. Valves
 3. Inline Equipment
 4. Penetrations (including floor and wall sleeves)
 5. Class I Butt Welds

Measuring guidelines are provided in Appendix A.

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- 3.3.2. The Walkdown Package is utilized for the 79.14 piping walkdown or walkdown. It will generally consist of:
1. The As-Built Fab Iso(s) within a stress calculation.
 2. The Hanger Roll-Up drawings within a stress calculation.
 3. Stress Calculation Index Sheet(s).
 4. Pipe Walkdown Checklist(s).
 5. Hanger Walkdown Checklist(s).
 6. Pipe Work Authorization
6. The Analysis Package is utilized for the transmittal of 79.14 walkdown information to HPES. It shall consist of (as a minimum):
1. The As-Constructed Fab Iso(s) within a stress calculation.
 2. Analysis Data Sheet(s) for each Stress Calculation.
 3. The Stress Calculation Index Sheet(s).
7. Field Engineers (surveyors) shall be qualified to and work in accordance with WP-142.
 8. The 79.14 supervisor shall be on distribution for the Work Package Completion Verification (WPCV) from Pipe Engineering which indicates when initial or re-work to a Fab Iso is complete.
 9. Rework to satisfy the system stress analysis shall be in the form of new or revised design; or per the applicable HPES procedure where new or revised design is not applicable. In either of the above cases the 79.14 supervisor shall receive a memo from HPES (stress) describing the scope of the rework. The 79.14 supervisor shall notify the appropriate manager of the rework.
 10. A suspense file shall be established to assure that when a PWA is issued the subject piping is reprocessed in accordance with this procedure upon receipt of a WPCV.
 11. When a revision is received for a hanger which has previously been processed in accordance with this procedure and the revision affects the hardware the hanger shall be processed in accordance with this procedure.

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- 3.3.2. (stress) will notify the 79.14 supervisor by memo when a calculation has been accepted and to which revision of the FAB Iso it was accepted to.

4.0 PROCEDURE

4.1 79.14 Walkdown of ASME Piping

Responsible Position

79.14 Supervisor

Duties:

1. Monitors construction to determine when all work on the Fab Iso(s) within a stress calculation boundary is complete and these lines have been supported with the minimum number of permanent supports required for RFT.
2. Issue Stress Calculation Freeze Notice (Exhibit 1) signifying that no additional piping work can be performed without a formal revision to the Fab Iso, if applicable, and the completion of a PWA.
HPES A.B. Supervisor
3. Complete As-Built of Fab Iso(s) within the Stress Calculation.
79.14 Supervisor
4. Obtain 4 copies of the Fab Iso(s) and distribute per paragraph 3.3.1.
5. Walkdown pipe, completing the 79.14 Pipe Walkdown Checklist (Exhibit 2) for each Fab Iso. within the Stress Calculation.
 1. If no discrepancies are found, sign appropriate block of PWC and insert the PWC in the Walkdown Package.
 2. If discrepancies are found:
 1. Open an item on the 79.14 OITL.
 2. Sign appropriate block of PWC.
 3. Notify Pipe Manager of discrepancies via 79.14 OITL.
 3. Record analysis data for HPES (stress) on Pipe Analysis Data Sheet(s) and retain for addition to the Analysis Package.

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4.1. Pipe

6. Evaluate discrepancies and resolve by:
 1. Changing the design by FCR/PW.
 2. Reworking per applicable procedures and current design
 3. Providing design document which justifies the open item.
7. Submit resolutions to 79.14 supervisor
 1. Where design was changed (Reference Paragraph 4.1.6) provide a copy of the document or, where a copy is not practical, providing the document number.

79.14 Supervisor

8. Close the open piping discrepancies.
 1. For design changes:
 1. Have Fab Iso revised to reflect the revised Design/As-Constructed condition.
 2. Reference the reason for closure of the discrepancies in the comments section of the PWC and attach a copy of the document to the PWC if available.
 2. For rework:
 1. Walkdown the discrepancy.
 2. If acceptable, record that rework was acceptable in the comments section of the PWC, initial and date.
 3. If unacceptable, contact the Piping Manager and provide him with necessary details for correction.
9. If the discrepancy item is the final discrepancy on the PWC, sign and date the "Walkdown Complete" block of the PWC and insert into the walkdown file.
10. Close discrepancy on the 79.14 OITL.

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4.2 Hanger Walkdown and 79.14 Completion

79.14 Supervisor

1. Monitor completion of hangers within the stress Calculation.
2. When approximately 100% of the supports within a Frozen Stress Calculation have been completed, perform the following:

4.2.2

down the supports, completing a Hanger Walkdown Checklist.

1. If no discrepancies are found, sign the appropriate block of the HWC and insert it in the Walkdown Package.
 2. If discrepancies are found:
 1. Open an item on the 79.14 OITL.
 2. Sign the appropriate Block of the HWC.
 3. Notify the Hanger Manager of the discrepancies via the 79.14 OITL.
 2. Have Field Engineering survey the piping within the Stress Calculation boundary recording on the As-Built Fab Iso the data required in Paragraph 3.3.4.
- Note: Piping survey is to be conducted when 100% of the supports are complete. If this is not possible due to scheduling, the 79.14 supervisor may evaluate the system for potential movement and proceed, if in his judgement that subsequent hanger installations will not affect the pipe As Constructed location.
3. Review the Field Engineers "Red Lined" As-Constructed drawing.
 1. If adequate information has been provided sign and date the drawing and place it in the Analysis package. Place one Copy in the Walkdown Package.
 2. If additional information is required, return the drawing(s) to the Field Engineers (survey) with instructions.
 4. Review the Analysis Package to assure that it contains the data necessary for HPES (Stress) to perform its stress analysis.
 5. Transmit Analysis Package to HPES Project Engineer (Stress) for final stress analysis.

Hanger Manager

AS CONSTRUCTED PIPE

DESCRIPTION

4.2.

the discrepancies identified by the Hanger Walkdown and
by:

1. Changing the design by FCR/PW or PHP.
2. Reworking per applicable procedures and current design.
3. Providing design document which justifies the open item.
7. Submit resolution to 79.14 supervisor.
 1. Where design was changed (Reference Paragraph 4.2.8) provide a copy of the document or, where a copy is not practical, provide the document number.

79.14 Supervisor

8. Close the open Hanger discrepancies.
 1. For design changes:
 1. Have hanger drawing modified to reflect the Revised Design/As-Constructed Condition.
 2. Reference the reason for closure of discrepancies in the comments section of the HWC and attach a copy of the document to the HWC if available.
 2. For Rework:
 1. Walkdown the open item.
 2. If acceptable, record that rework was acceptable in the comments section of the HWC, initial and date.
 3. If unacceptable, contact the Hanger Manager and provide him with the necessary details for correction.
9. If the discrepancy is the final discrepancy on the HWC, sign & date the "Walkdown Complete" block of the HWC and insert HWC into the walkdown file.

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10. Close open item on the 79.14 OITL.

4.3 Final Hanger Turnover

79.14 Supervisor

1. Perform the following activities to ready the Hanger System for FHT.
 1. Generate a master tracking list of Hangers by system and stress calculation.

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CONSTRUCTED PIPE

4.3.1. status of all hangers within a system to assure that they
been walked down.

3. When all hangers within a system are complete generate a
Turnover Package in accordance with Start-Up T/O procedure
AP-X-04.

5.0 EXHIBITS AND APPENDICES

- 5.1. Exhibit 1 - Stress Calculation Freeze Notice (Rev. 0-01/85)
- 5.2. Exhibit 2 - Pipe Walkdown Checklist (Rev. 0-01/85)
- 5.3. Exhibit 3 - Hanger Walkdown Checklist (Rev. 0-01/85)
- 5.4. Exhibit 4 - 79.14 Open Items Tracking List (Rev. 0-01/85)
- 5.5 Exhibit 5 - Analysis Data Sheet (Rev. 0-01/85)
- 5.6. Exhibit 6 - Stress Calculation Index Sheet (Rev. 0-01/85)
- 5.7. Exhibit 7 - Flow Diagram (Rev. 0-01/85)
- 5.8 Exhibit 8 - Pipe Work Authorization (Rev. 0-01/85)
- 5.9. Appendix A - Measuring Criteria (Rev. 0-01/85)

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STRESS CALC. FREEZE NOTICE

TO: Distribution

FROM: _____/79.14 Supervisor

Calc. # 1

Stress calc. # 2 has been frozen. Fab Iso(s) included in this Stress Calc. Are: 3

No work is to be performed on piping within this stress calc. unless it has been approved on a Pipe Work Authorization form. And, when applicable, the change has been incorporated into the Fab Iso. (ie no psfm's).

If you have any questions contact the undersigned 4

SAMPLE

Sincerely,

79.14 Supervisor

Dist: 5

FOR COMPLETING THE STRESS CALC. FREEZE NOTICE

79.14 Supervisor

- 1 & 2. Enter Stress Calc. #
3. Enter Fab Isos involved & the boundary on the Fab Iso if applicable
4. Enter Ext. #
5. Enter distribution

WALKDOWN CHECK

STRESS CASE

FAB. ISO. #

Rev. #

ACC.

9

REJ.

N/A

1. The configuration is per the Rolled-Up Fab Iso.

☐
☐
☐

2. The operational clearances around pipe is acceptable.

☐
☐
☐

1.	Line #	(3)	Design temp	(4)	insulation type	(5)
	general:	insulation thickness	(6)	@sleeves:	insulation thickness	(6)
		Minimum clearance	(7)		Minimum clearance	(7)
		Total	(8)		Total	(8)
2.	Line #		Design temp		insulation type	
	general:	insulation thickness		@sleeves:	insulation thickness	
		Minimum clearance			Minimum clearance	
		Total			Total	
3.	Line #		Design temp		insulation type	
	general:	insulation thickness		@sleeves:	insulation thickness	
		Minimum clearance			Minimum clearance	
		Total			Total	

3. Fittings and bends installed are per the Rolled-Up Fab Iso.

☐
☐

4. All temporary supports have been removed.

☐
☐

5. Valve operator orientation is per the Rolled-Up Fab Iso.

☐
☐
☐

Valves & D

Unit Fab Iso.

ACC.

REJ.

RV

☐☐☐

7. Comments

(10)

Walkdown Complete, discrepancies found

Walkdown Complete

No Discrepancies found/discrepancies closed

(11)

WD Specialist

Date

(12)

WD Specialist

Date

Reviewed:

(13)

79.14 Supervisor

Date

Page 3

**INSTRUCTION FOR COMPLETING
THE
PIPE WALKDOWN CHECKLIST**

1. Enter Str.
2. Enter Fab Iss. Revision #.
3. Enter Line #.
4. Enter design temperature from Piping Line List.
5. Enter insulation type from Piping Line List.
6. Enter insulation thickness from piping Line List.
7. Enter appropriate minimum clearance from para. 3.9.4.
8. Add 6 & 7 together for general pipe & sleeves.
9. Make the comparison required by item 1 thru 6 and check the appropriate block.
10. Enter comments & specifics on rejections and resolutions to those rejections.
11. Sign & date the block when the Walkdown is complete & discrepancies are found.
12. Sign & date this block when the Walkdown is complete if there are no discrepancies found or when the discrepancies are resolved.
13. 79.14 supervisor reviews form for completeness then signs & dates.

HANGER WALKDOWN CHECKLIST

STRESS CALC. # 1

HANGER # 2 Rev # _____

3
ACC. REJ. N/A

1. There are no visible signs of tampering.

☐
☐

2. The support is taking a gravitational load.

☐
☐
☐

3. There are no operational obstructions.

☐
☐

Postulated movement (s) _____

4

4. Comment _____

5

SAMPLE

Walkdown Complete
discrepancies found

6 /
WD. Specialist date

Walkdown Complete with
no discrepancies found/discrepancies
closed

7 /
WD. Specialist date

Reviewed:

8 /
79.14 Supervisor date

INSTRUCTIONS FOR COMPLETING
THE
HANGER WALKDOWN CHECKLIST

1. Enter Stress Calc #.
2. Enter Hanger #.
3. Examine the appropriate attribute & check the appropriate block.
4. Enter postulated movements from Hanger drawing.
5. Enter comments and specifics on rejections.
6. Sign & date when walkdown is complete & if discrepancies were found.
7. Sign & date when walkdown is complete and if no discrepancies were found or when the discrepancies are resolved.
8. 79.14 supervisor reviews form for completeness then signs & dates.

LIST

STRESS
CALC #

FAB ISO / REV. / HANGER / REV.

DATE OPENED

DESCRIPTION

DATE CLOSED

① ②

③

④

⑤

⑥

⑦

⑧

SAMPLE

This Form may be computerized. Final Record may vary in form.

INSTRUCTIONS FOR COMPLETING THE 79.14 OPEN ITEMS LIST

1. Enter Sequential Number from L.
2. Enter Discipline H = Hanger
P = Pipe
3. Enter Stress Calc #.
4. Enter Fab Iso# and revision #.
5. Enter Hanger # and revision #.
6. Enter Date Opened.
7. Describe the Condition.
8. Enter Date Closed.

ANALYSIS DATA SHEET

TO HPES

STRESS C

①

The following As-Constructed Drawing(s) are transmitted to you with the following comments to perform the As-Built stress reconciliation

②

The following comments may affect the stress analysis.

③

SAMPLE

79.14 Supervisor

INSTRUCTION FOR COMPLETING
THE
ANALYSIS DATA SHEET

1. Enter Stress Calc #.
2. Enter Fab Iso. #(s).
3. Enter comments or other data pertinent to stress evaluation.
4. Sign & date.

STRESS CALC INDEX SHEET

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STRESS CA

WALKDOWN CHECKLIST

FAB. ISO./

Rev. #

ACC.

HANGER #

REV. #

ACC.

WALKDOWN SPECIALIST/DATE

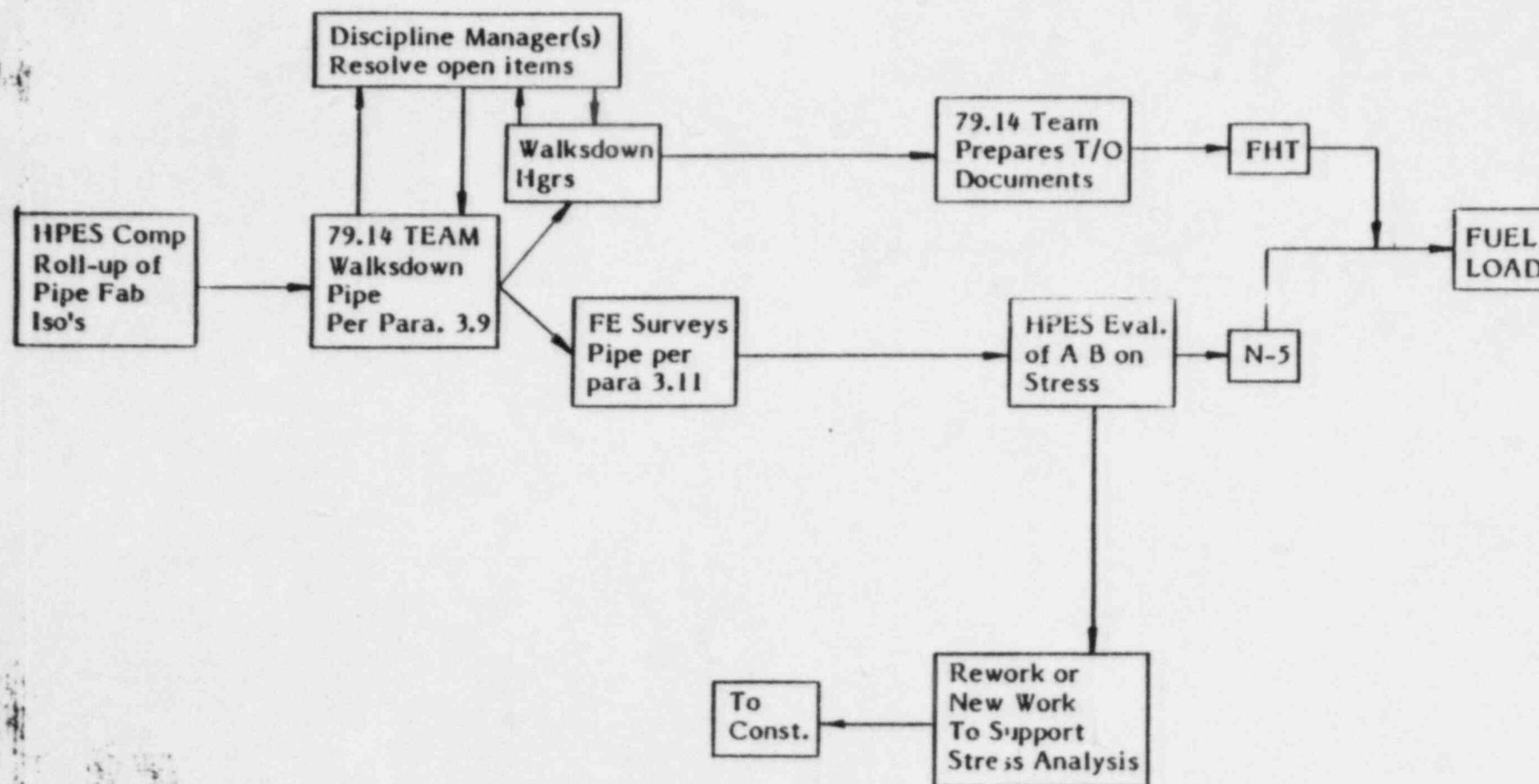
01/83

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Exhibit 6
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INSTRUCTIONS FOR COMPLETING THE STRESS CALC INDEX SHEET

1. Enter Stress Calc#.
2. Enter Fab Iso and Hangers on Fab Iso's within the Stress Calc Boundary.
3. When the Walkdown Checklist is acceptable, check the ACC block.
4. When Fab Iso and support walkdowns are completed, sign & date bottom of sheet.



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PIPE WORK AUTHORIZATION

Piping on Fab Iso 1 is to be reworked due to 2
FCR DCN etc.

☐ Fab Iso revision 4 has been generated to document this work.

☐ The Fab Iso is not affected by this rework.

Describe the work to be done:

5

SAMPLE

6
Pipe Engineer Date

☐ Work described will not affect the As-Built condition. Place copy of this PWA in walk down file.

☐ Work described does affect the As-Built condition. Place a copy of this PWA in the suspense file and reprocess in accordance with WP-141 upon receipt of a Work Package Completion Verification.

8
79 1b Supervisor Date

INSTRUCTIONS FOR COMPLETING
THE PIPE WORK AUTHORIZATION

Pipe Engineer

1. Indicate the Fab Iso #
2. Provide the reason for the rework or document authorizing the work.
3. Check the appropriate block.
4. Indicate the revision which incorporates the design change to be implemented.
5. Describe the work to be performed. Be specific include welds to be cut, flanges to be made-up, spools to be installed, etc.
6. Sign and date.

79.14 Supervisor

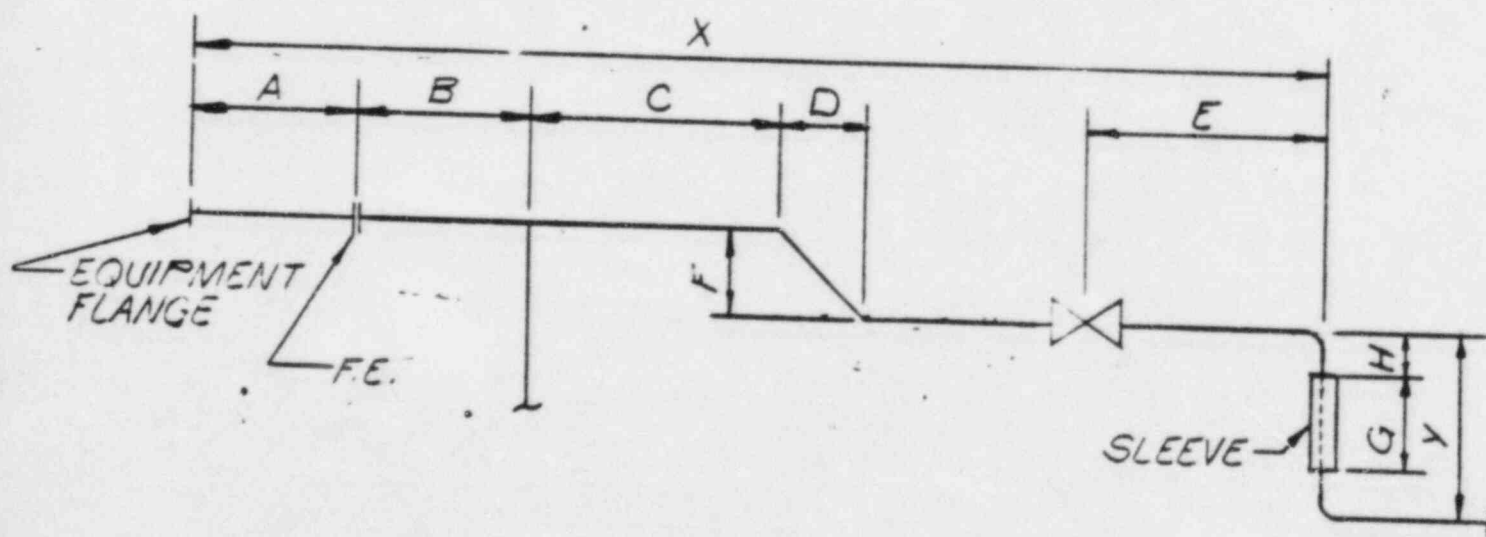
7. Check the appropriate block.
8. Sign and date.

MEASURING GUIDELINES

Measurements of the As-Built condition shall be as follows:

1. Measurements shall be to be accurate to $1/16"$. The measuring tolerance shall be $\pm 1/8"$ except clearances at sleeves where it shall be $\pm 1/8"$.
2. Measurements shall be from the center line of fittings, valves, inline components and Class 1 butt welds; they shall be to the leading and trailing edges of sleeves or penetrations.
3. Along straight runs of pipe a work point (elevation) shall be established at a minimum of 20' intervals. Sufficient elevations shall be taken to verify slope.
4. Dimensions to building reference points shall be reference dimensions only.
5. An overall measurement of a run shall be taken and then measurements from component to component along the run. One "component to component" measurement is not to be made thus preventing the accumulation of tolerances from affecting the overall dimension. As much as possible confirm the existing dimensions on the FI to reduce drafting time.

Example:



6. Bend angles shall be to the nearest degree.
7. The 79.14 supervisor is to be contacted, for direction, when the measuring criteria is unclear.