ATTACHMENT 2

Peach Bottom Atomic Power Station
Units 2 and 3
Docket Nos. 50-277 and 50-278

License Amendment Request
Response to Request for Additional Information

Alternative Source Term (AST)

PBAPS Calculation 1-1, Revision 1, *"Stress Analysis for Main Steam Outside Containment"*

ATTACHMENT 1
Design Analysis Cover Sheet

Design Analysis (Major Revision)		**Last Page No.** [6] App. 2, Page 126	
Analysis No.: [1] 1-1		**Revision:** [2] 1	
Title: [3]	**Stress Analysis for Main Steam Outside Containment**		
EC/ECR No.: [4] 03-00525		**Revision:** [5] 0	
Station(s): [7]	PBAPS	**Component(s):** [14]	
Unit No.: [8]	2 & 3	AO-2-01A-086A	AO-3-01A-086A
Discipline: [9]	PEDM	AO-2-01A-086B	AO-3-01A-086B
Descrip. Code/Keyword: [10]	Pipe Stress Analysis	AO-2-01A-086C	AO-3-01A-086C
Safety/QA Class: [11]	Q	AO-2-01A-086D	AO-3-01A-086D
System Code: [12]	01, 904		
Structure: [13]	Reactor/Turbine Bldg		

CONTROLLED DOCUMENT REFERENCES [15]

Document No.:	From/To	Document No.:	From/To
PM-789	From	PM-810	From
PM-815	To		

Is this Design Analysis Safeguards Information? [16] Yes ☐ No ☒ If yes, see SY-AA-101-106

Does this Design Analysis contain Unverified Assumptions? [17] Yes ☐ No ☒ If yes, ATI/AR#:

This Design Analysis SUPERCEDES: [18] calculation PM-786 **in its entirety.**

Description of Revision (list affected pages for partials): [19]

This revision is a complete reanalysis to document the main steam piping analysis and the evaluation of unit 3 as-found spring hanger loads per 3R14 ISI inspection. This revision incorporates and supersedes analysis performed in calculation PM-786, since the referenced calculation duplicates the evaluation of the main steam piping.

Preparer: [20]	M. Kazoun (Print Name)	(Sign Name)	12/28/04 (Date)
Method of Review: [21]	**Detailed Review** ☒	**Alternate Calculations (attached)** ☐	**Testing** ☐
Reviewer: [22]	J. Boyer (Print Name)	(Sign Name)	2-2-05 (Date)
Review Notes: [23]	Independent review ☒	Peer review ☐	

(For External Analyses Only)

External Approver: [24]	(Print Name)	(Sign Name)	(Date)
Exelon Reviewer: [25]	(Print Name)	(Sign Name)	(Date)

Is a Supplemental Review Required? [26] Yes ☐ No ☒ If yes, complete Attachment 3

Exelon Approver: [27]	James Jorsa (Print Name)	(Sign Name)	3/2/05 (Date)

ATTACHMENT 1
General Review Questions
Page 1 of 1

Page 2

DESIGN ANALYSIS NO. 1-1 **REV:** 1

		Yes	No	N/A
1.	Does the Design Analysis conform to design requirements?	☒	☐	☐
2.	Does the Design Analysis conform to applicable codes, standards, and regulatory requirements?	☒	☐	☐
3.	Have applicable design and safety limits been identified?	☒	☐	☐
4.	Is the analysis method appropriate?	☒	☐	☐
5.	Are the methods used and recommendations given conservative relative to the design and safety limits?	☒	☐	☐
6.	Are assumptions/Engineering Judgments explained and appropriate?	☒	☐	☐
7.	Have appropriately verified Computer Program and versions been identified, when applicable?	☒	☐	☐
8.	Does the Computer Program conform with the NRC SER or similar document when applicable?	☒	☐	☐
9.	Has the input been correctly incorporated into the Design Analysis?	☒	☐	☐
10.	Has the input been reviewed by all cognizant design authorities?	☒	☐	☐
11.	Are the analysis outputs and conclusions reasonable compared to the inputs and assumptions?	☒	☐	☐
12.	Are the recommendations/results/conclusions reasonable based on previous experience?	☒	☐	☐
13.	Has a verification of the Design Analysis been performed by alternate methods? (LINE BY LINE VERIFICATION)	☐	☒	☐
14.	Has all input data been used correctly and is it traceable?	☒	☐	☐
15.	Has the effect on plant drawings, procedures, databases, and/or plant simulator been addressed?	☒	☐	☐
16.	Has the effect on other systems been addressed?	☒	☐	☐
17.	Have any changes in other controlled documents (e.g. UFSAR, Technical Specifications, COLR, etc.) been identified and tracked?	☐	☐	☒
18.	When applicable, are the analysis results consistent with the proposed license amendment?	☐	☐	☒
19.	Have other documents that have used the calculation as input been reviewed and revised as appropriate?	☒	☐	☐
20.	Have all affected design analyses been documented on the Affected Documents List (ADL) for the associated Configuration Change?	☒	☐	☐
21.	Do the sources of inputs and analysis methodology used meet current technical requirements and regulatory commitments? (If the input sources or analysis methodology are based on an out-of-date methodology or code, additional reconciliation may be required if the site has since committed to a more recent code)	☒	☐	☐
22.	Have supporting technical documents and references been reviewed when necessary?	☒	☐	☐

Table of contents

		Page No.
1.	Cover Sheet	1
2.	DA Review Sheet	2
3.	Table of Contents	3
4.	Purpose	4
5.	Assumptions/Notes	4
6.	References	5
7.	Inputs	5
8.	Identification of Computer Programs	5
9.	Method of Analysis/Results	6
10.	Conclusion	7

Attachments:

Appendix 1. Analysis of Main Steam Outside Containment including Power Re-rate (104 pages)

Appendix 2. Evaluation of Unit 3 Main Steam Outside Containment to address As-Found spring hangers setting changes (126 pages)

Purpose

This calculation revision documents the stress analysis of units 2 and 3 Main Steam (MS) piping outside containment in accordance with the requirements of PBAPS specification NE-104 and ANSI B31.1 code, 1973 Edition including S73.

This calculation will determine and verify acceptability of:
1. Piping stresses
2. Valve accelerations
3. Support and penetration loads

Background:

Documentation of revision 0 of this calculation (stored in Microfilm Roll No. 81-107) could not be found and no replacement could be obtained from Bechtel Corporation. Later analysis (PM-786) and evaluation (E2 of A/R A1435406) were performed for MS piping outside containment and will be incorporated in this calculation revision.

Assumptions/Notes:

No assumptions require further confirmation.

1. Unit 2 MS line "D" was fully analyzed for weight, thermal, earthquake, and fluid transient, representing all MS lines in both units, for station power re-rate modification No. 8565 under stress calculation No. PM-786. During 3R14 refueling outage (September 2003), Unit 3 spring hanger settings were found out of tolerance. An engineering evaluation was performed for the acceptance of the as-found condition.

This calculation revision will include PM-786 analysis as Appendix 1 and unit 3 as-found spring settings evaluation as Appendix 2. These piping analysis and evaluation were performed in accordance with the requirements of ANSI B31.1 code, 1973 Edition including S73.

2. Appendix 1 analysis modeled the MSIV operator in downward direction, while as-built direction is upward. This error will not have adverse effect on evaluation results or support loads since the valve is located close to the containment penetration anchor.

3. There are some input parameters differences between Appendix 1 and Appendix 2 analyses, such as using support stiffness, support component weights, piping data, analysis boundary, and valve modeling. The Appendix 1 analysis is the final complete analysis and applies to both units. However, unit 3 evaluation in Appendix 2 is used to evaluate the effect of spring setting changes and determine piping stress and support load changes only. The changes in the stress and support load results between two dead weight load cases (one includes as-designed spring settings from support detail drawings, WT01 case, and the second is for as-found spring settings during 3R14 refueling outage, WT02 case), were reviewed and accepted in the following pages.

4. Note 9 on page 14 of Appendix 1 justifies the decoupling of the 14" line to main steam Bypass valve from the 26" main steam line analysis by stating that their moment of inertia ratio is about 15 while the actual ratio is about 10. However, since the connection is located close to the main steam stop and control valves block (considered an anchor for the MS analysis), it is judged acceptable to decouple the 14" line from the 26" main steam line analysis with no adverse effect on the qualifications of each.

5. Note 14 on page 15B of Appendix 1 evaluated additional 550 pounds for main steam isolation valve Poppet Assembly. However, this assembly is not installed for outside containment isolation valves (per system manager J. Kozakowski). This evaluation is considered for information only until the assembly is installed.

References

(Also see Appendices 1 and 2 for references)

1. Specification NE-104, Rev. 0
2. ANSI B31.1 code, 1973, including summer 73 addenda
3. ANSI B31.1.0, 1967 code
4. ECR 03-00525, Rev. 0
5. Specification M-300, Rev. 16
6. Specification M-301, Rev. 12
7. Specification, G-14, Rev. 0
8. Calculations PM-810 Rev. 0
9. Calculation Pm-789, Rev. 0
10. E2 OF A/R A1435406
11. ME101 computer program for stress analysis, version N2
12. Unit 2 Piping Hanger drawings # HSO-121 R 3, HSO-122 R 2, HSO-123 R 1, HSO-124 R 1
13. Unit 3 Piping Hanger drawings # HSO-171 R 2, HSO-172 R 1, HSO-173 R 1, HSO-174 R 1

Inputs:

Design inputs are as shown in Appendices 1 and 2

Identification of Computer Programs:

1. NUPIPE-Stone & Webster, ME-110, Version 06, Level 03 for Stress analysis.
2. ME101, Bechtel Piping Stress Analysis program, Version N2

Method of Analysis//Results

Analysis description, methodology, and output, provided by the reference stress analysis programs, are shown in Appendices 1 and 2. Appendix 1 includes a complete stress analysis for "D" line (was documented in calculation PM-786) and Appendix 2 documents the evaluation of unit 3 as-found spring settings during 3R14 ISI inspection. Appendix 2 changes affect only weight loads and piping stress for unit 3. Therefore, Units 2 and 3 overall piping qualifications are per appendix 1 except unit 3 weight analysis is per appendix 2 (i.e. unit 3 dynamic and thermal loads are per Appendix 1). Appendix 2 includes two weight analyses for unit 3 configuration, one with as-designed spring cold loads and the second is for as-found spring cold loads.

Piping Stress:
See Appendix 1 for Unit 2 results.

For unit 3, the maximum piping dead weight stress (see appendix 2), incorporating as-found spring cold loads, is less than the maximum stress for the original as-designed spring cold loads. Therefore, no change to piping stresses of Appendix 1, due to unit 3 spring setting changes, is required.

Support loads:
See Appendix 1 for Unit 2 results.

Since the analyzed Unit 2 line "D", in App. 1, corresponds to Unit 3 line "A" (analyzed in App. 2), the following is the unit 3 rigid support load change comparison and acceptance (Snubbers and valve accelerations are not affected):

Support No. (NP, In App. 2)	WT. Load change (App. 2)	FLTD LD (Att 2, App. 1)	Percentage Load Change	Remarks
X-7A (A05)	Reduced	Not Affected	Reduced	Anchor Loads generally reduced, Acceptable
3-1DB-H3 (A35)	+295	32921	0.9%	Minor change, acceptable
3-1DB-H4 (A40)	-28	19953	Reduced	Load reduced, Acceptable
3-1DB-H5 (A45)	-210	16484	Reduced	Load reduced, Acceptable
3-1DB-H6 (A50)	+535	16868	3.2%	Minor change, acceptable (Strut capacity is 20250#)
3-1DB-H7 (A55)	-1842	19686	Reduced	Load reduced, Acceptable
3-1DB-H9 (A70)	+3242	18219	17.8%	See Note 1 below
Restr-5 (AR-5)	+295	53499	<1%	Insignificant change, acceptable

Note 1:

Per page 2 of attachment 4 of Appendix 1, the original faulted load of this support is +34382, -49945# While the Re-rate analysis load is +983, -18219#. If the change in support load, due to spring hangers as-found settings in App. 2 (3242#) is added, the faulted support load would be +983, -21461# which is less than original loads and therefore, acceptable.

Valve Accelerations/Nozzle and penetration anchor loads/pipe movements:

See Appendix 1 for evaluation and acceptance.

Conclusion

Main Steam piping outside the containments for both unit 2 and 3, from penetrations X-7A, B, C, and D to MS stop valves, were analyzed including station power re-rate. In addition, as-found spring cold loads (for unit 3) were reviewed and found acceptable. All piping stresses, valve accelerations, penetration and support loads for both units meet the requirements of PB specification NE-104 and their corresponding design code and capacities.

PHILADELPHIA ELECTRIC COMPANY SERVICE

NUCLEAR GROUP
M-20599 Rev. 3/93
DOCTYPE 061

CALCULATION COVER SHEET

1. Calculation No. ~~PM-786~~
Page 1

2. ☐ LGS ☒ PBAPS

UNIT(S) 2/3

3. MOD/NCR/ECR No.: MOD 8565
Other:

4. Responsible Branch: SECP

5. Total No. of Pages: 117

6. Last Page No: ATTACH 5 pg 1

7. ☒ Safety Related ☐ Non-Safety Related

8. Description: QUALIFICATION OF MAIN STEAM PIPING FROM CONTAINMENT TO STOP VALVE FOR POWER RERATE CONDITIONS

9. System/Topic No.: 1
Structure: N/A
Component: PEN N-7D, MSJ-4

RECORD OF REVISIONS

10. Rev. No.	11. Description of Revision	12. Vendor Calc. Number	Rev.	13. Assumptions Yes	No	14. Signatures Preparer	Reviewer	Approver/Date
0	ORIGINAL	03040-NP(L)-PM 786	B		X	F. Capuano (SWEC)	J.S. Boyer (SWEC)	[signature] 11/4/93

15. Related Calc. Numbers						
Provides Info to:	PM-815					
Receives Info from:	PM 789, 810					
Supersedes:						

16. ☐ Manual ☒ Computer
Computer program and version: SW NUPIPE V06 L03

Calc. 1-1 R.1 App. 1 Page 1 of 107

Effective Date: 8/6/93

Calc. 1-1 R.1
AFA-1 Page 2

CALCULATION REVIEW CHECKLIST

Initiating Document (e.g., ECR, NCR, Mod No.): MOD 8565

CALCULATION No.: PM-786
Calc. Rev. No.: 0
Page 2

MANUAL CALC.	COMPUTER CALC.	REVIEW CRITERIA	YES or N/A
X	X	SOURCES OF DATA & FORMULAE WERE REVIEWED AND VERIFIED TO BE CORRECT & COMPLETE	Yes
X	X	INPUT DATA FROM SOURCES IN ITEM 1 ABOVE IS CORRECT AND PROPERLY USED IN THE CALCULATION	Yes
X		THE ANALYTICAL METHOD USED IN THE CALCULATION HAS BEEN CONSIDERED AND IS PROPER FOR THE INTENDED USE	N/A
X		MATHEMATICAL ACCURACY HAS BEEN CHECKED AND IS CORRECT (INDICATE METHOD USED)	
		a) COMPLETE CHECK OF EACH COMPUTATION	N/A
		b) SPOT-CHECK OF SELECTED COMPUTATIONS WHICH ARE INITIALED IN THE CALCULATION	N/A
		c) PERFORMANCE OF ALTERNATE OR APPROXIMATION CALCULATION (ATTACHED)	N/A
X	X	CALCULATION RESULTS WERE CHECKED AGAINST APPLICABLE DOCUMENTED DESIGN CRITERIA AND FOUND IN CONFORMANCE	Yes
X	X	EXISTING CALCULATIONS REQUIRING REVISION AS A RESULT OF THIS CALCULATION HAVE BEEN IDENTIFIED	Yes
	X	THE ANALYTICAL METHOD DESCRIBED IN THE COMPUTER CALCULATION SUMMARY IS PROPER FOR THE INTENDED USE	Yes
X	X	ALL SYSTEMS AND TOPIC NUMBERS ASSOCIATED WITH THE CALCULATION HAVE BEEN LISTED	Yes
	X	COMPUTATIONAL ACCURACY HAS BEEN CHECKED AND FOUND CORRECT (INDICATE THE METHOD USED)	
		a) CHECK SAMPLE CALCULATION USING DATA OTHER THAN THAT USED IN THE SAMPLE	N/A
		b) PERFORMANCE OF ALTERNATE OR APPROXIMATE CALCULATION (ATTACHED)	N/A
		c) DESCRIBE OTHER METHOD USED QA Verified Program	Yes
	X	PROGRAM USED IS APPROPRIATE, INPUT IS VALID, AND OUTPUT IS REASONABLE CONSIDERING THE INPUT	Yes
X	X	PIMS CODE OF CALCULATION BRANCH OWNER HAS BEEN LISTED IN BLOCK 4	Yes
X	X	ASSUMPTIONS REQUIRING CONFIRMATION HAVE BEEN IDENTIFIED AND TRACKING A/Rs HAVE BEEN INITIATED	Yes

THE CRITERIA LISTED ABOVE ARE MINIMUM CRITERIA TO BE CONSIDERED AND ARE NOT INTENDED TO LIMIT THE INITIATIVE OF THE REVIEWER TO CONSIDER OTHER CRITERIA.

ATTRIBUTES APPLICABLE TO MANUAL AND COMPUTER CALCULATIONS ARE NOTED BY A "X" IN THE APPROPRIATE COLUMN. FOR CHECKING OF REVISIONS TO MANUAL CALCULATIONS, THE ATTRIBUTES MAY BE LIMITED TO ONLY REVISED PORTIONS OF THE CALCULATION.

LIST THE DOCUMENTS USED TO SUPPORT THE REVIEW:
Reviewed Ref. Documents Listed on Pgs 9, 10, 10A

REVIEWED BY: J.S. Boyer DATE: 10/21/93

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION TITLE PAGE

Calc. 1-1 R.1
APP. 1 Page 3

▲5010.84(FRONT)

CLIENT & PROJECT	PAGE
PECo – PEACH BOTTOM ATOMIC POWER STATION UNITS 2,3	3

CALCULATION TITLE (Indicative of Objective)	QA CATEGORY (X)
QUALIFICATION OF MAINSTEAM PIPING FROM CONTAINMENT TO STOP VALVE FOR POWER RERATE CONDITIONS	[X] I - NUCLEAR SAFETY RELATED [ ] II [ ] III [ ] OTHER

CALCULATION IDENTIFICATION NUMBER			
J.O. OR W.O. NO.	DIVISION & GROUP	CURRENT CALC. NO.	OPTIONAL WORK PACKAGE NO.
03040	NP(C)	PM-786	N/A

APPROVALS – SIGNATURE & DATE			REV. NO. OR NEW CALC NO.	SUPERSEDES CALC NO. OR REV NO.	CONFIRMATION REQUIRED (x)	
PREPARER(S) / DATE(S)	REVIEWER(S) / DATE(S)	INDEPENDENT REVIEWER(S) / DATE(S)			YES	NO
F. CAPUANO F. Capuano 4/5/93	J. S. BOYER J S Boyer 4.6.93	J. S. BOYER J S Boyer 4.6.93	A	N/A		X
F. Capuano 10/21/93	J S Boyer (10/21/93)	J S Boyer (10/21/93)	B	A		X

DISTRIBUTION

GROUP	NAME & LOCATION	COPY SENT (x)	GROUP	NAME & LOCATION	COPY SENT (x)
PROJECT FILE	JOB BOOK R4.3.1	X			

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

▲5010.65P

CALCULATION IDENTIFICATION NUMBER				PAGE
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	APP. 1
03040	NP(C)	~~PM-786~~ 1-1 Rev 1	N/A	P. 4

REVISION STATUS TABLE

REV. NO.	PAGE NO.	DESCRIPTION / REASON
A	ALL	ORIGINAL ISSUE
B	see below	Evaluation of the additional weight (550 lb) of the new MSIV Poppet Assembly addressed in reference 25. Pages revised: 3, 4, 10A, 15B, 25, 30, 31, 34 Pages added: None Pages deleted: None

NOTE: UNDER DESCRIPTION / REASON DESCRIBE THE CHANGES MADE AND THE REASON FOR THE REVISION.

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

▲5010.65

App. I

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	~~PM-786~~ 1-1 R. 1	N/A	5

TABLE OF CONTENTS

SECTION	PAGE
CALCULATION COVER SHEET	1
ATTRIBUTE PAGE	2
CALCULATION TITLE PAGE	3
REVISION STATUS TABLE	4
TABLE OF CONTENTS	5
OBJECTIVE	6
METHOD	6
ASSUMPTIONS	7
CONCLUSIONS	7
REFERENCES	8-10,10A
NOTES	11-15,15A,B
DESIGN INPUT:	
WORKSKETCH	16
FLUID TRANSIENT LOADING	17
AMPLIFIED RESPONSE SPECTRA	18
CROSS-SECTIONAL PROPERTIES	20
BASIC ANALYTICAL DATA	21
SYSTEM RESTRAINTS	22
COLD LOAD FORCE APPLIED AT SPRING HANGERS	23
HAND INPUT SIFs	24
CONCENTRATED WEIGHTS	25
LOADING CONDITIONS ANALYZED	27
RESULTS SUMMARY:	
MAXIMUM STRESS LEVELS	28
SYSTEM ACCELERATIONS	32
PIPING DISPLACEMENTS	33
PENETRATION LOAD EVALUATION	34
STOP VALVE LOAD EVALUATION	35
PIPE SUPPORT LOAD SUMMARY	36
COMPUTER LOG	72
ATTACHMENTS:	
1. INPUT DATA ECHO	22 PAGES
2. GRINNELL SNUBBER LOAD RATINGS	3 PAGES
3. POWER RERATE OPEN ITEM PB-OI-024	1 PAGE
4. SUPPORT LOAD COMPARISON (PM-786 vs. PREVIOUS ANALYSES)	15 PAGES
5. MICROFICHE	1 PAGE

A5010.65

APP. 1

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	~~PM~~ 786 1-1 R. 1	N/A	6

OBJECTIVE:

To analyze a representative Unit 2 or 3 Main Steam line from the penetration flued head anchor, outside the containment, to the inlet of the stop valve for the operating conditions resulting from power rerate and qualify this piping in accordance with references 1, 2. As addressed in the Notes section, Main Steam line D (from Penentration N-7D to MSV-4) for Unit 2 is selected as the representative piping.

Determine pipe support loads to be used for pipe support design evaluation.

Verify that valve accelerations/equipment loads are within allowable limits (as applicable).

Determine pipe support loads for selected supports on other main steam lines to be used for the pipe support design evaluation required for the resolution of Power Rerate Project Open Item No. OI-PB-024. The specific supports are as follows: Line C supports H17 and H26, Line B supports H27, H28, H29, and H30, Line A supports H41 and H42.

NOTE:

Utilization of this calculation by persons without access to the pertinent factors and without proper regard for its purpose could lead to erroneous conclusions. Should it become desirable to use this calculation to support design or station activities other than those explicitly specified in this Section, the responsible engineering branch (as noted in Block 4 of PECo cover sheet) shall be contacted to ensure that the purposes, assumptions, judgements and limitations are thoroughly understood.

METHOD:

A mathematical model of the piping system is prepared from piping drawings and other design inputs. Geometrically determined boundary conditions are defined by equipment/piping penetrations or are established by six-way pipe supports (anchors). The model is then analyzed by utilizing the NUPIPE-SW (ME-110) Computer Program applying the coding methods established in Section II of the NUPIPE-SW Users' Manual (ref 21). The results are then evaluated for conformance to the objective of the calculation.

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	PM-786 1-1 R 1	N/A	7

ASSUMPTIONS: (further verification not required)

1. Based on reference 16, the distribution of weight for AO-086D is conservatively assumed as follows:

   CG of valve body is located at the end of the valve body casing, estimated to be 3.9' from the centerline of the valve with a lumped weight of 80% of the total weight (i.e. .80*10075 = 8060).

   CG of operator is located at the end of the operator, 9.5' from the centerline of the valve with a lumped weight of 20% of the total weight (i.e. .20*10075 = 2015).

CONCLUSIONS:

The completed analysis shows that piping is qualified in accordance with Reference 1, 2.

Pipe support loads have been determined and transmitted to the pipe support group for evaluation.

Valve accelerations and/or equipment loads are within allowable limits (as applicable).

Pipe support loads for selected supports on other main steam lines have been determined and transmitted to the pipe support group for evaluation.

REFERENCES:

1. Piping Codes
   a. ANSI B31.1 Power Piping Code, 1967 Edition

   b. ANSI B31.1 Power Piping Code, 1973 Edition, including Summer 1973 Addenda.

   c. ANSI B31.1 Power Piping Code, 1980 Edition, including Winter 1982 Addenda.(for allow. stress of A-672 GR.B70 only)

2. UFSAR for the Peach Bottom Atomic Power Station, Section 4.11, Appendix A, and Appendix C.

3. Specification 6280-G-14 Revision 1, General Project Requirements for Seismic Design and Analysis of Equipment and Equipment Supports for PBAPS Units 2 & 3.

4. Specification 6280-M-300 Revision 13 (including addenda), Specification for Piping Materials, Instrument Piping Standards and Valve Classifications.

5. Calculation PM-789 Rev. 0, System Piping Conditions Evaluation for Power Rerate.

6. Grinnell Handbooks
   a. ITT Grinnell Piping Design And Engineering, 5th Edition.
   b. Pipe Hanger Design and Engineering, Grinnell, Revised 1979

7. Calculation PM-810 Rev. 0, Fluid Transient Load on Main Steam Lines due to Stop Valve Closure for 5% Power Rerate.

8. Specification NE-111 Revision 0, Thermal Insulation Outside the Drywell.

REFERENCES:

9. P&IDs
   a. 6280-M-351 sht 2, Rev 51, Unit 2 Nuclear Boiler
   b. 6280-M-303 sht 1, Rev 46, Unit 2 MS Bypass and Crossaround

10. QADs
   a. 6280-M-851 sht 2, Rev 26, Unit 2 Nuclear Boiler
   b. 6280-M-803 sht 1, Rev 22, Unit 2 MS Bypass and Crossaround

11. Piping and Hanger Location drawings (Line D)
   a. ISO-2-1-1, Rev 7, Unit 2 Main Steam Line D
   b. HISO-121, Rev 2, Unit 2 Main Steam to MSV-4
   c. 6280-M-175, Rev 7, Unit 2 Main Steam Piping System

12. Pipe Support Detail drawings (Line D)
   a. M-1813-0 sht 1 for hanger 1DB-H1
   b. M-1813-0 sht 2 for hanger 1DB-H2
   c. M-1813-0 sht 3 for hanger 1DB-H3
   d. M-1813-0 sht 4 for hanger 1DB-H4
   e. M-1813-0 sht 5 for hanger 1DB-H5
   f. M-1813-0 sht 6 for hanger 1DB-H6
   g. M-1813-0 sht 7 for hanger 1DB-H7
   h. M-1813-0 sht 8 for hanger 1DB-H9B
   i. M-1813-0 sht 9 for hanger 1DB-H10
   j. M-1813-0 sht 10 for hanger 1DB-H11
   k. M-1813-0 sht 11 for hanger 1DB-H12
   l. M-1813-0 sht 12 for hanger 1DB-H13
   m. M-1813-0 sht 13 for restraint no. 5
   n. M-1813-0 sht 14 for hanger 1DB-S7A
   o. M-1813-0 sht 15 for hanger 1DB-S7A
   p. S-257, Rev 7 for hanger 1DB-S2A

13. Piping and Hanger Location drawings for other Unit 2 and 3 MS lines
   a. HISO-122 Rev 1
   b. HISO-123 Rev 1
   c. HISO-124 Rev 1
   d. 6280-M-190, Rev 2, Unit 3 Main Steam Piping System
   e. HISO-171 Rev 2
   f. HISO-172 Rev 1
   g. HISO-173 Rev 1
   h. HISO-174 Rev 1

REFERENCES:

14. Pipe Whip Restraint drawings
    a. S-397, Rev 7
    b. S-398, Rev 3
    c. S-399, Rev 6

15. Penetration drawings
    a. M-205, Rev 2
    b. M-206, Rev 4
    c. M-207, Rev 4

16. MSIV AO-086D vendor print - M-1-R-12, Rev 5, shts 1 and 2

17. Main Steam Stop Valve and Restraint drawings
    a. M2-76D-13, Rev 11 (vendor dwg)
    b. M2-408D-4, Sh 2, Rev 11 (vendor dwg for restraint capacities)
    c. S-256, Rev 6 (stop valve restraints)

18. Pipe Hanger Vendor Catalogs
    a. Grinnell Pipe Hangers Catalog PH-90, dated 1989

19. Main Steam Bypass Calculations on Bechtel Microfilm Cartridge M.S.O. No. 128275, Job No. 11187, Dated 1-22-81, Roll No. SFPD-81-117
    a. 7-1S dated 02/14/72
    b. 7-10T dated 01/07/75
    c. 7-11T dated 01/07/75
    d. 7-12T dated 01/07/75
    e. 7-13T dated 01/07/75

20. Main Steam Calculations on Bechtel Microfilm Cartridge M.S.O. No 128273, Job No. 11187-047, Dated 1-21-81, Roll No. SFPD-81-0107
    a. 1-1T dated 01/30/73
    b. BP-TOP-2 dated 12/12/78
    c. 1-1W dated 02/27/73
    d. 1-1S date/rev not available

21. NUPIPE-SW, ME-110, Version 06, Level 03

22. Main Steam Line D Calculation D-007, dated 4/24/75 on Bechtel Microfilm Cartridge M.S.O. No. 456, Job No. 6280, Dated 3-16-76, Roll No. 76-134

23. Bechtel PBAPS Stress Group Technical Files, Binder 19, Main Steam Miscellaneous Calculations and Modifications, Microfilmed on Cartridge No. 86-0435, Dated 7-28-86

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

▲5010.65

APP. 1

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	~~PM-786~~ 1-1 R.1	N/A	10A

REFERENCES:

24. Pipe Stress Calculation PM-777 Rev. 0, Pipe Stress Margin Screening Evaluation due to Power Rerate - Main Steam and Feedwater Systems

25. GE-NE-123-E169-0992, Main Steam Piping System Stress and Support Load Evaluation for Installation of MSIV nose-Guided Poppet Assembly, dated September 1992, Transmittal No. EOC-92-046 dated October 15,1992 B

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	~~PM~~ ~~786~~ 1-1 R.1	N/A	11

NOTES:

1. Forces and moments on restraints, supports and equipment are those imposed by the piping system (i.e. Actions not Reactions).

2. Unless otherwise noted forces and moments reported at inline anchors represent the total forces and moments acting upon that anchor, considering contributions from piping on all sides of the anchor. Reactions reported on terminal anchors are due to piping shown in this report only.

3. The supports in the scope of this calculation are located in the reactor building and turbine building.
   a. Relative seismic displacements between reactor building supports are insignificant(< 1/32") per reference 2 and therefore are not analyzed.

   b. The differential elevation between turbine building support attachments is insignificant since the piping is routed at one elevation (excluding pipe slope). Therefore relative seismic displacements are not applicable within the turbine building.

   c. Considering the small magnitude of the reactor building seismic displacement, the out of phase displacement between the reactor and turbine buildings is also insignificant. Furthermore, there is approximately 50 feet of piping flexibility between the closest same direction seismic restraints in the two buildings.

4. For lines requiring seismic analysis, the reactions reported are cyclic in character, and reactions must be considered as acting in either the positive or negative direction.

5. Main Steam line D is analyzed as the representative main steam line since Line D has the longest total length of piping and all four lines in both units are routed and supported similarly except as noted (see references 11 and 13). Line D is also the line for which the fluid transient loading of reference 7 was generated. The difference between the four loops, as it impacts the scope of work

NOTES:

in this calculation, is the arrangement of rigid vertical supports near the elbow adjacent to snubber S7A for lines C and D and snubber S42A for lines A and B. Details are specified below.
Lines C and D have at least one rigid support close to the elbow. This is the first rigid support upstream of the MSV. Lines A and B have a spring hanger on each side of the elbow. The first rigid support upstream of the MSV is approximately an additional 40' upstream of the elbow. This difference is addressed in note 12.

6. The inlet to stop valve 4 (node 390) is the boundary for the qualification of piping in this analysis. This is based on reference 17 which indicates that the 4 stop valves/control valves (for lines A,B,C,D) are welded together forming one large assembly. Note that the control valves are mounted to the outlet of the stop valves. This assembly is:

   a) rigidly supported in the vertical direction by a pair of 250 kip struts which also restrain rotation about the global X axis.

   b) dynamically supported in the global X direction by a pair of 200 kip snubbers (skewed approximately 20 degrees down from global X) which also restrain dynamic rotation about the global Y axis. These snubbers are offset from the centerline of the main steam line by approximately 3.5' and as a result contribute some dynamic rotational restraint about the global Z direction.

   c) dynamically supported in the global Z direction by a single 72 kip snubber which does not contribute to rotational restraint.

   In summary, the assembly is dynamically restrained in the X,Y, and Z translational direction and the X and Y rotational directions. The massive nature of the 4 stop valve/control valve assembly, in conjunction with the contribution from the pair of "global X" snubbers, is considered to provide the Z rotational direction restraint. These restraints effectively anchor the stop valve inlet for dynamic loading.

NOTES:

7. Statically, node 390 is only restrained in the vertical and rotational X directions. Therefore, the piping model is extended up to the H.P. turbine inlet (node 480) to obtain the proper restraining effect at node 390 for the static cases (i.e. thermal and deadweight). This portion of the model is based on reference 20a, modeled as weightless, and is excluded from the scope of this calculation.

8. The main steam piping in this calculation is qualified to the criteria specified in Appendix C, Table C.5.7 of the UFSAR (ref 2) which is consistent with or more conservative than the requirements of reference 1b. Using the equation notation of reference 1b, the criteria is summarized below.

Condition	Equation	Allowable
Sustained	11	Sh
Occasional (Upset)	12U	1.2Sh
Occasional (Faulted)	12F	1.8Sh
Expansion	13	Sa = 1.25Sc + .25Sh
Sustained + Expansion	14	Sh + Sa
Occasional (Upset) + Expansion	12U + 13	1.2*(Sh + Sa)

Load combinations addressing dynamic loads due to fluid transients are not specifically discussed in reference 2 or in the original piping code, reference 1a. Therefore, consistent with previous analysis, calculation BP-TOP-2 (ref 20b), the fluid transient loading (upset condition) is considered independently of seismic loading. Accordingly, equation 12U will evaluate the maximum of either fluid transient or seismic loading.

NOTES:

9. Node 355 is the intersection of the 26" main steam line with the 14" bypass line. Even though the diameter ratio is only approximately 2 to 1, the moment of inertia ratio is approximately 15 to 1. Therefore the 14" bypass line is decoupled from the 26" main steam line consistent with the analyses of the bypass lines (reference 19) which considered the 14" bypass line to be anchored at the 26" mainsteam line. Qualification of the 14" bypass line is not within the scope of this calculation. Only the weight contribution of the 14" bypass line to the 26" line is considered in this analysis.

10. Vertical restraint no. 5 is located on the 26" long radius elbow from nodes 20 to 45 directly under the riser from nodes 45 to 65. The pipe attachment is modeled at node 40 to provide restraint along the axis of the riser. However the actual piping attachment is at the horizontal centerline of the elbow from nodes 20 to 45. This results in a differential elevation of 2.75' between the actual attachment of the support and the coded location. This difference would yield fictitous vertical thermal loads between node 5 and 40. To negate this effect, a dummy vertical member is coded from node 40 to 41 (-2.75') with the same properties as the attached piping. Restraint no. 5 is modeled at node 41.

11. The four pipe whip restraints, 1 to 4 (ref 11b and 14), are conservatively not included in the piping analysis. They are gapped to accommodate the thermal displacements but would provide some seismic and dynamic restraint. Accordingly, the seisimic and dynamic results of the analysis are conservative.

NOTES:

12. Summary of Analyses

a. Job 3762, Run 001, dated 2/23/93
Evaluates all loading conditions with all supports functioning.

Results - Pipe stresses acceptable for all loading conditions. Restraint no. 5 (node 41) uplifts due to dynamic loading. SSE load on support S2A (node 105, 72kip, Grinnell, 6" bore, Fig. 200, hydraulic snubber) exceeds snubber capacity by only 1.5%.
Load = 114.3 kips > 112.6 kips per Attachment 2. Note that upset condition load of 61 kips is < the capacity.

This small SSE overload can be attributed to the conservatism in the ARS envelope. The piping in the Turbine Building (TB) is located at approximate elevation 154' which is very near the ARS elevation of 150'. Significantly higher accelerations exist at the next ARS elevation of 165' which was enveloped in this analysis. The significant effect of the 165' TB ARS, on snubber S2A, is demonstrated in study analysis JOB 7541 discussed below. Note that with the exception of snubber S2A which is addressed by Job 7541 all piping, supports and components are qualified using the TB ARS at elevation 165'.

b. Job 3823, Run 002, dated 2/23/93
Same as Job 3762 except Restraint no. 5 (node 41) is conservatively considered non-functioning for all loading conditions due to uplift.

Results - Pipe stresses acceptable for all loading conditions. Loads on snubber support S2A (node 105) are within capacity.

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	~~PM-786~~ 1-1 R.1	N/A	15A

NOTES:

12. Summary of Analyses (cont'd)

c. Job 7541, Run 008, dated 3/24/93 (study analysis)
Only evaluates the faulted condition using the piping model from Job 3762 and excluding TB ARS at elevation 165'. The purpose of this study analysis is to demonstrate the significant effect the TB ARS at elevation 165, has on snubber S2A.

Results - The load on snubber S2A was reduced from 114.3 kips to 86 kips. It is based on this significant load reduction and the discussion included with Job 3762 that the load on snubber S2A is considered not to be overloaded by 1.5% but rather loaded to its capacity of 112.6 kips.

d. Job 6343, Run 023, dated 3/30/93
The piping model for Line D (Job 3821) is modified to reflect the vertical support arrangement on Lines A and B as discussed in note 5. The purpose of this analysis is to generate seismic and dynamic loadings for Line A supports H41 and H42 and Line B supports H27, H28, H29, and H30 for evaluation as required for the resolution of OI-PB-024 (See Objective). Note that thermal and deadweight loads from the previous analyses can be used (see Attachment 4). A piping model representative of lines A and B is obtained by coding Line D rigid hangers H7 and H9B as "spring hangers" with stiffness = 1.0 lb/in and with an applied force equal to the deadload on the rigid hangers from Job 3823.

Results - Seismic and dynamic loads representative of those on hangers H27, H28, H29, H30, H41, and H42 have been generated. Due to the similarity between the 4 main steam lines addressed in note 5, the loads on the subject supports can be obtained from the corresponding Line D supports as follows:

H27 see H3
H28 see H4
H29, H41 see H5
H30, H42 see H6

Detailed information is provided in Attachment 4.

NOTES:

13. This calculation fulfills the requirement of screening calculation PM-777 (ref. 24) to do further evaluation of the impact of rerated conditions on the Main Steam piping.

14. Evaluation of Additional 550 lb for New MSIV Poppet Asembly

Due to the close proximity of the MSIV to the penetration anchor (node 5), the additional poppet assembly weight will only impact the span from the anchor to the valve. The additional 550 lb represents approximately a 5% increase over the weight of the MSIV and piping to the anchor.

MSIV = 10075 lb 2.583' of piping = 746 lb

550/(10075+746) = .05

The critical location impacted by this change would be the anchor at node 5. The impact on this node is addressed below. Note that this small additional weight will not significantly impact the valve accelerations on page 32. (B)

Increase deadweight stress by 5%, and using a safety factor of 1.5, increase dynamic stress by 7.5%.

The stresses at node 5 for Job 3762 are more than 7.5% less than the maximum stresses shown on pages 28 and 29. Therefore there is no impact.

The stresses at node 5 for Job 3823 are evaluated as follows and documented on pages 30 and 31.

Design press. stress= 6674 psi, Peak press. stress= 8003 psi

8003 - 6674 = 1329 psi

EQ11= (10033-6674)*1.05 + 6674 = 10,201

EQ12U= (19268-10033)*1.075 + 10201 + 1329 = 21457 < max on p30

EQ14= 11546 + (10201-10033) = 11,714

EQ12F = (24701-10033)*1.075 + 10201 + 1329 = 27,298

The conclusions of the penetration load evaluation on page 34 are not impacted, even with an additional 550 lb, given the large magnitude of the existing loads.

Peach Bottom Atomic Power Station
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11 x 17 pg. 16 + App. 2 pgs. 12-17 of Calc 1-1

RADIOGRAPHS

If you need assistance, please contact PBAPS Records Management

DESIGN INPUT

FLUID TRANSIENT LOADING (REF 7)

THTAPE = 019576
THFILE = 3
Total Integration Time = 3.0 sec
Integration Time Step = .001 sec
Damping = .5 %
Cutoff Frequency = 200 HZ

Pipe Segment No.	Curve No.	Node	Direction
1-7	7	10	-Z*
1-8	8	15	-Z
1-9	9	65	-Y
1-10	10	110	-Z
1-11	11	260	+X
1-12	12	345	-Z
1-13	13	360	-X

* A scaler of .25 is applied to the load from segment 1-7 to address the ratio of the segment length included in this model vs. the total segment length.

Segment length from node 5 to 15 = 6.166 '
Total segment length considered in reference 7 = 24.67 '

6.166/24.67 = 0.25

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

UNIFORM SUPPORT MOTION SEISMIC RESPONSE SPECTRA SET 1 (REF 3)
AMPLIFIED RESPONSE SPECTRA (ARS) - RB EL.135'-165',TB EL.150'- 165'.5% DAMPING

X-EARTHQUAKE		Y-EARTHQUAKE		Z-EARTHQUAKE	
PERIOD (SEC)	ACCELERATION (G)	PERIOD (SEC)	ACCELERATION (G)	PERIOD (SEC)	ACCELERATION (G)
0.010	0.120			0.010	0.100
0.033	0.120			0.033	0.100
0.037	0.150			0.037	0.150
0.045	0.200			0.045	0.230
0.077	0.330			0.071	0.360 (.31)
0.100	0.600 (.45)			0.091	0.840 (.48)
0.111	1.920 (1.42)			0.095	1.890 (1.06)
0.125	1.920 (1.42)			0.111	1.890 (1.06)
0.133	2.270			0.118	0.930 (.58)
0.164	2.270			0.122	1.090
0.167	2.090			0.133	2.270
0.196	0.640			0.164	2.270
0.244	0.360			0.167	2.090
0.435	0.290			0.196	0.640
0.833	0.290			0.238	0.390
1.220	0.130			0.500	0.390
10.000	0.000			0.769	0.360 (.22)
				1.250	0.120
				10.000	0.000

VALUES IN ( ) ARE ACCELERATIONS USED IN STUDY ANALYSIS JOB 7591 AND REPRESENT THE REDUCTION IN ARS WHEN TB EL 165 IS EXCLUDED. SEE NOTE 12 a & c

Calc. 1-1 Rev. 1
App. 1, P 18

PECO PBAPS UNIT#2 03040-~~NP(C)-PM-786~~ (RERATE) MS "D" CONTMT TO TSV

UNIFORM SUPPORT MOTION SEISMIC RESPONSE SPECTRA SET 2 (REF. 3.)
AMPLIFIED RESPONSE SPECTRA (ARS) - (2/3) GROUND SPECTRA .5% DAMPING

X-EARTHQUAKE		Y-EARTHQUAKE		Z-EARTHQUAKE	
PERIOD (SEC)	ACCELERATION (G)	PERIOD (SEC)	ACCELERATION (G)	PERIOD (SEC)	ACCELERATION (G)
		0.000	0.043		
		0.025	0.043		
		0.033	0.060		
		0.050	0.087		
		0.100	0.113		
		0.111	0.122		
		0.125	0.133		
		0.143	0.153		
		0.167	0.167		
		0.182	0.173		
		0.222	0.173		
		0.250	0.167		
		0.333	0.153		
		0.500	0.113		
		1.000	0.057		
		10.000	0.057		

Calc. 1-1 R.1
APP. 1, P19

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP (C)	PM ~~-786~~ 1-1 R.1	N/A	20

DESIGN INPUT

CROSS SECTIONAL PROPERTIES (REFERENCE 2, 5, 6)

ITEM NO.	SYSTEM NO.	PIPE CLASS	NOM. DIA. (IN)	SCH.	OD (IN)	WALL THK. (IN)	PIPE WT. (#/FT)	CONTENTS		INSULATION			TOTAL WT. (#/FT)
								TYPE	WT. (#/FT)	TYPE	THK. (IN)	WT.(1) (#/FT)	
1	1	DB/DBN	26	N/A	26.00	1.086 (4)	289	STEAM	N/A	I	3.5	28	317
2	1	DB	6	80	6.625	.432	28.6	WATER	11.3	I	3.5	10.6	50.5
3 (2)	1	DB	26	N/A	26.00	1.086 (4)	N/A	N/A	N/A	N/A	N/A	N/A	0
4	1	DB	14	80	14.00	.750	106	STEAM	N/A	I	3.5	17	123
5	1	N/A	28	N/A	28.00	1.375	N/A	STEAM	N/A	N/A	N/A	N/A	0
(3)	1	DB	4	80	4.50	.337	15	STEAM	N/A	II	2.5	5.3	20.3

Notes:

1. Insulation weight includes: 2 lb for aluminum jacket on 26" pipe.
   1.2 lb for aluminum jacket on 14" pipe.
   0.8 lb for aluminum jack
   0.6 lb for aluminum jacket on 4" pipe.
2. Item 3 is a dummy cross section for modeling of the AOV stem.
3. This item is not modeled in the analysis. It is only used to calculate the weight contribution of the decoupled 4" branch pipe.
4. tnom = tmin/.875 = .950/.875 = 1.086 accounting for manufacturers tolerance of 12.5%.

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	~~PM-786~~ 1-1 R.1	N/A	21

DESIGN INPUT

BASIC ANALYTICAL DATA (REFERENCE 1b, c, 4, 5)

LOAD CASE NO.	MODE/ NOP (2)	MATERIAL	E(C) *E6 (PSI)	E(H) *E6 (PSI)	S(C) *E3 (PSI)	S(H) *E3 (PSI)	OPER. TEMP. (F)	THERMAL GROWTH (IN/FT)	DESIGN PRESSURE (PSI) (1)	DESIGN TEMP. (F)
2	1 / 1	A-672 GR.B-70 Class 22 (3)	29.90	27.04	17.5	17.5	551	.04120	1115	583
2	1 / 2	A-106GR.B	27.90	26.04	15.0	15.0	551	.04120	1115	583
3	2 / 1	A-672 GR.B-70 Class 22 (3)	29.90	26.82	17.5	17.5	583	.04433	1115	583
3	2 / 2	A-106GR.B	27.90	25.82	15.0	15.0	583	.04433	1115	583

(1) 1337 is the maximum operating pressure.

(2) Mode 1 is normal operating, Mode 2 is maximum operating.

(3) Note that previous main steam stress calculations 1-1T and BP-TOP-2 (ref 20) identify the pipe material as A155 KC70. The material shown above is per reference 4. This difference is of no consequence since both materials have the same properties and allowable stress.

(4) Reference 1c is used for the allowable stresses for material A-672 GR. B-70 Class 22 since this is the first year of the ANSI code in which this material appears.

PECO PBAPS UNIT#2 03040-NP(C)-~~PM-786~~ (RERATE) MS "D" CONTMT TO TSV

SYSTEM RESTRAINTS

ORTHOGONAL RESTRAINTS

NODE	GROUP	TYPE	TRANSLATIONAL (LBF/IN) X	Y	Z	ROTATIONAL (IN-LBF/RAD) X	Y	Z	MARK NO.
5	1	ANCHOR	1.E+08	1.E+08	1.E+08	1.E+10	1.E+10	1.E+10	FLUED HEAD PEN N-7D
75	1	RESTRAINT		1500.					1D8-H1
100	1	RESTRAINT		2160.					1D8-H2
105	1	SNUBBER	1.E+08						1D8-S2A
125	1	RESTRAINT		1.E+08					1D8-H3
140	1	RESTRAINT		1.E+08					1D8-H4
170	1	RESTRAINT		1.E+08					1D8-H5
210	1	RESTRAINT		1.E+08					1D8-H6
240	1	RESTRAINT		1.E+08					1D8-H7
250	1	SNUBBER			1.E+08				1D8-S7A
275	1	RESTRAINT		1.E+08					1D8-H9B
305	1	RESTRAINT		3000.					1D8-H10
325	1	RESTRAINT		2160.					1D8-H11
340	1	RESTRAINT		3000.					1D8-H12
370	1	RESTRAINT		2400.					1D8-H13
390	1	RESTRAINT		1.E+08		1.E+10			MSV-4 (INLET)
390	1	SNUBBER	1.E+08		1.E+08		1.E+10	1.E+10	MSV-4 (INLET)
41	1	RESTRAINT		1.E+08					RESTRAINT #5
480	1	ANCHOR	1.E+08	1.E+08	1.E+08	1.E+10	1.E+10	1.E+10	H.P. TURBINE (INLET)

STIFFNESS AT SPRING HANGERS IS PER REF 12 & 18. ALL OTHER SUPPORTS ARE RIGID

SYSTEM RESTRAINTS FOR OTHER ANALYSES DIFFER FROM THAT SHOWN ABOVE AS FOLLOWS:

JOB	DESCRIPTION
3823	NODE 41 (REST. #5) NOT MODELED

calc. 1-1 rev. 1
AIP 1, p22

NODAL LOADS

STATIC FORCES (REF 12)

NODE	THERMAL MODE	FORCES (LBF) X	Y	Z	MOMENTS (FT-LBF) X	Y	Z
75 (H1)	1	0.	8887.	0.	0.	0.	0.
100 (H2)	1	0.	6125.	0.	0.	0.	0.
305 (H10)	1	0.	8697.	0.	0.	0.	0.
325 (H11)	1	0.	6434.	0.	0.	0.	0.
340 (H12)	1	0.	8571.	0.	0.	0.	0.
370 (H13)	1	0.	7200.	0.	0.	0.	0.

See App. 2 for Unit 3 spring settings

COLD LOAD INPUT AT SPRING HANGERS

1-1 R.1

APP. 1 P23

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

▲5010.65

APP. 1

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK COD	PAGE
03040	NP (C)	~~PM-786~~ 1-1 R. 1	N/A	24

DESIGN INPUT

STRESS INTENSIFICATION FACTORS

	COMPONENT										SIF	NODES
1	TAPER TRANSITION										1.9	5, 10, 390 20(3)
2	ANSI TEE										i=.9/(4.4t/r)^(2/3) r= mean radius of run pipe	
	OD	t										
A)	26	1.086									1.70	355
3	BRANCH CONNECTIONS										i= 1.5(Rm/Tr)^(2/3) (r'm/Rm)^(1/2) (T'b/Tr) (r'm/rp)	
	Rm/Tr<=50 , rm/Rm<=0.5										Rm= mean radius of run pipe	
	RUN		BRANCH								r'm= mean radius of branch pipe	
	OD	Tr	OD	T'b	Rm	r'm	rp	Rm/Tr	r'm/Rm	LIMITS	rp= outer radius of branch pipe	
A)	26"	N/A	6"	SCH80							i= 1.41	385 (2)
	26.000	1.086	6.625	0.432	12.457	3.0965	3.313	11.47	0.25	OK		
B)	26"	N/A	4"	SCH80							i= 0.90 USE 1.3	380
	26.000	1.086	4.500	0.337	12.457	2.0815	2.250	11.47	0.17	OK		
C)	miscellaneous small bore instrumentation connections										i= USE 1.3	360, 365, 370

REFERENCES: 1b (ANSI 1973)

NOTES:

1) SIFs FOR BUTT WELDED ELBOWS, ARE CALCULATED IN NUPIPE PER REF ABOVE.
2) THE SIF FOR THE 6" DRIP LEG ATTACHED TO THE 26" ELBOW AT NODE 35 IS CONSIDERED TO BE THE PRODUCT OF THE INDIVIDUAL SIFs.

ELBOW SIF = .9/(TR/r^2)^(2/3) = 2.14

BRANCH SIF = 1.41

SIF PRODUCT = 3.02 *

* THIS SIF IS CODED ON MEMBER 35-40. THEREFORE AN SIF OF 3.02 IS ALSO CONSIDERED AT TRUNNION FOR RESTRAINT NO. 5

3) ELBOW SIF, PER NOTE 1 ABOVE, OF 2.14 EXCEEDS TAPER SIF.

DESIGN INPUT

CONCENTRATED WEIGHTS (lbs)

Weight of AOV 086D is 10,075 lb per reference 16. Weight distribution is per assumption 1. SEE NOTE 14 FOR ADDITIONAL WEIGHT OF 550 lb

(8)

Weight contribution of a decoupled branch line is approximated as the weight of 1/2 of a standard deadweight span per ref 6. Weights are rounded to the nearest 10 lb.

Line OD (in)	Std Stm Span (ft)	Weight (lb/ft)	1/2 Span Weight (lb)
4	17	20.3	170
14	32	123	1970

Approximate weights of pipe whip restraint attachments to the piping are based on pipe restraint detail drawings (ref. 14). These weights are summarized below.

restraint/node	weight	description	
2, 3, 4	1080	clamp =	380
(54, 56, 76)		(4) 3" lugs =	475
		(4) 6-1/2" lugs =	220
		misc. hardware =	5
1	170	clamp =	102
(82)		lug =	68

DESIGN INPUT

CONCENTRATED WEIGHTS (lbs)

Approximate weights of pipe support attachments to the piping are based on pipe support detail drawings (ref. 12), and support vendor catalog (ref. 18). These weights are summarized below.

support/(node)	weight	description		
R5 (40)	580	20" SCH 80 trunnion 2.78'long		
H1,H2,H11,H12 (75,100,325,340)	109	clamp		
S2A (105)	620	plate box around pipe =	467	
		1/2 72K snubber =	146	
		misc. hardware =	7	
H3 (125)	330	2 channels @ 11.5#/ft, 4 ft long =		93
		plate steel =		115
		1 strut =		86
		u-bolt =		28
		misc. hardware =		8
H4,H5,H6,H7,H9B (140,170,210, 240,275)	300	clamp =	272	
		1/2 strut =	27	
		misc. hardware =	1	
S7A (250)	1450	plate box around pipe =	836	
		1/2 200K snubber =	515 *	
		4 rods =	50	
		misc. hardware =	49	
H10 (305)	162	clamp		
H13 (370)	220	steel =	108	
		saddle =	45	
		rod =	27	
		u-bolt =	28	
		misc. hardware =	12	

* Weight of a 200K snubber was unavailable from reference 18 therefore 1/2 the weight of a 200K snubber is considered equal to the weight of a 100K snubber.

Weights are shown in the Input Data Echo section (Attachment 1) on lines beginning with "CWE".

STONE & WEBSTER ENGINEERING CORPORATION PAGE OF

AX STRESS SUMMARY

CLIENT J.O. 03040.24.54.0 PROB.

PIPING SYSTEM MS "D" (CONTMT TO TSV)

REPORT OR AX 03040-NP(C)-PM-786

REF. DRAWINGS ISS/REV DATE

COMPUTER RUN DATE SUBMITTER
R0170001 2/23/93 F.CAPUANO

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

LOADING CONDITIONS ANALYZED

LOAD CASE NUMBER	DESCRIPTION
1	DEADWEIGHT
2	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
10	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS

Calc. 1-1 R. 1
App. 1, p27

STONE & WEBSTER ENGINEERING CORPORATION PAGE ___ OF ___

AX STRESS SUMMARY

CLIENT J.O. 03040.24.54.0 PROB.

PIPING SYSTEM MS "D" (CONTMT TO TSV)

REPORT OR AX 03040-NP(C)-PM-786

REF. DRAWINGS ISS/REV DATE

COMPUTER RUN R0170001 DATE 2/23/93 SUBMITTER F.CAPUANO

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

JOB 3762 ALL SUPPORTS FUNCTIONING

SEE NOTE 8

CLASS 2, 3, OR 4 MAXIMUM STRESS LEVELS (PSI) - NORMAL/UPSET CONDITIONS
E(COLD)= 29.900 S(C)= 17,500 (PSI)
P-NO. = 1 S(H)= 17,500 (PSI) 583 DEG-F

EQUATION	POINT NO.	MEMBER TYPE	MAX. CALC. STRESS		ALLOWABLE STRESS
SUSTAINED STRESS (EQUATION ~~8~~ 11)	170	RUN	7621.	<	17,500 = (Sh)
OCCASIONAL STRESS (EQUATION ~~9~~ 12U)	40	ELBOW	17756.	<	21,000 = (1.2Sh)
EXPANSION STRESS (EQUATION ~~10~~ 13)	260	ELBOW	3709.	<	26,250 = (1.25Sc + .25Sh) = Sa
SUSTAINED PLUS EXPANSION STRESS (EQUATION ~~11~~ 14)	260	ELBOW	10611.	<	43,750 = (Sh + Sa)

17756+1329* = 19085 < 21,000

S(C) = BASIC MATERIAL ALLOWABLE STRESS AT MINIMUM (COLD) TEMPERATURE
S(H) = BASIC MATERIAL ALLOWABLE STRESS AT MAXIMUM (HOT) TEMPERATURE

OCCASIONAL + EXPANSION

EQ 12U+13 40 ELBOW 19042+1329 < 52,500 = 1.2(Sh + Sa)
= 20,371

NOTE: STRESS LEVELS FOR THE 6" CARBON STEEL DRIP LEGS (E=27.9E6) ARE INSIGNIFICANT WHEN COMPARED TO THE STRESSES IN THE BALANCE OF THE PIPING. THEREFORE A SEPARATE TABULATION IS NOT PROVIDED.

* ADDITIONAL PRESSURE STRESS DUE TO MAXIMUM PRESSURE OF 1337psi
(1337 - 1115) * 26.00 / 4 * 1.086 = 1329psi

Calc. 1-1 R.1 App. 1, P28

STONE & WEBSTER ENGINEERING CORPORATION PAGE OF

AX STRESS SUMMARY

COMPUTER RUN R0170001 DATE 2/23/93 SUBMITTER F.CAPUANO

CLIENT J.O. 03040.24.54.0 PROB.

PIPING SYSTEM MS "D" (CONTMT TO TSV)

REPORT OR AX 03040-NP(C)-PM-786

REF. DRAWINGS ISS/REV DATE

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

JOB 3762

CLASS 2, 3, OR 4 MAXIMUM STRESS LEVELS (PSI) - FAULTED CONDITION

E(COLD)= 29.900 S(C)=17,500 (PSI)

P-NO. = 1 S(H)=17,500 (PSI) 583 DEG-F

EQUATION	POINT NO.	MEMBER TYPE	MAX. CALC. STRESS	ALLOWABLE STRESS
~~SUSTAINED STRESS (EQUATION 8)~~	~~170~~	~~RUN~~	~~7621.~~	
OCCASIONAL STRESS (EQUATION 9)12F	390	RUN	21945.	< 31,500 = 1.8(Sh)

21945 + 1329 = 23,274 < 31,500

S(C) = BASIC MATERIAL ALLOWABLE STRESS AT MINIMUM (COLD) TEMPERATURE

S(H) = BASIC MATERIAL ALLOWABLE STRESS AT MAXIMUM (HOT) TEMPERATURE

Calc. 1-1 R.1

App. 1, p29

STONE & WEBSTER ENGINEERING CORPORATION PAGE ___ OF ___

AX STRESS SUMMARY

COMPUTER RUN R0170002 DATE 2/23/93 SUBMITTER F.CAPUANO

CLIENT J.O. 03040.24.54.0 PROB.

PIPING SYSTEM MS "D" (CONTMT TO TSV)

REPORT OR AX 03040-NP(C)-~~PM-786~~

PECO PBAPS UNIT#2 03040-NP(C)-~~PM-786~~ (RERATE) MS "D" CONTMT TO TSV

JOB 8823 REST. NO. 5 NOT-FUNCTIONING

REF. DRAWINGS ISS/REV DATE

CLASS 2, 3, OR 4 MAXIMUM STRESS LEVELS (PSI) - NORMAL/UPSET CONDITIONS

E(COLD)= 29.900 S(C)=17,500 (PSI)

P-NO. = 1 S(H)=17,500 (PSI) 583 DEG-F

EQUATION	POINT NO.	MEMBER TYPE	MAX. CALC. STRESS		ALLOWABLE STRESS	
SUSTAINED STRESS (EQUATION ~~8~~ 11)	5	RUN	~~10853.~~ 10,201 *	<	17,500	B
OCCASIONAL STRESS (EQUATION ~~9~~ 12)	35	ELBOW	20132.	<	21,500	20132+1329=21,461 < 21,500
EXPANSION STRESS (EQUATION ~~10~~ 13)	260	ELBOW	3716.	<	26,250	
SUSTAINED PLUS EXPANSION STRESS (EQUATION ~~11~~ 14)	5	RUN	~~11646.~~ 11,714 *	<	43,750	B
EQ12+13	35	ELBOW	21668+1329 (22997)	<	52,500	

S(C) = BASIC MATERIAL ALLOWABLE STRESS AT MINIMUM (COLD) TEMPERATURE

S(H) = BASIC MATERIAL ALLOWABLE STRESS AT MAXIMUM (HOT) TEMPERATURE

* SEE NOTE 14 ON pg 15B B

Calc. 1-1 R.1 App. 1, p 30

STONE & WEBSTER ENGINEERING CORPORATION PAGE --- OF ---

COMPUTER RUN R0170002 | DATE 2/23/93 | SUBMITTER F.CAPUANO

AX STRESS SUMMARY

CLIENT ------------------------------------ J.O. 03040.24.54.0 PROB. ------

PIPING SYSTEM MS "D" (CONTMT TO TSV)

REPORT OR AX 03040-NP(C)-~~PM-786~~

REF. DRAWINGS ---------------------------- ISS/REV --------- DATE -----------

PECO PBAPS UNIT#2 03040-NP(C)-~~PM-786~~ (RERATE) MS "D" CONTMT TO TSV

JOB 3823

CLASS 2, 3, OR 4 MAXIMUM STRESS LEVELS (PSI) - FAULTED CONDITION

E(COLD)= 29.900 S(C)= 17,500 (PSI)

P-NO. = 1 S(H)= 17,500 (PSI) 583 DEG-F

EQUATION	POINT NO.	MEMBER TYPE	MAX. CALC. STRESS	ALLOWABLE STRESS
~~SUSTAINED STRESS (EQUATION 8)~~	~~5~~	~~RUN~~	~~10033.~~	
OCCASIONAL STRESS (EQUATION ~~9~~ 12F)	5	RUN	24701.	< 31,500

24701 + 1329 = ~~26030~~ 27298* < 31,500

* SEE NOTE 14 ON pg 15B

S(C) = BASIC MATERIAL ALLOWABLE STRESS AT MINIMUM (COLD) TEMPERATURE
S(H) = BASIC MATERIAL ALLOWABLE STRESS AT MAXIMUM (HOT) TEMPERATURE

App. 1, p31

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	PM-786 1-1 R.1	N/A	32

SYSTEM ACCELERATIONS:

The accelerations at the body (node 25) and the operator (node 30) of AO 086D are less than 0.5 g in each of the global directions for the following independent UPSET loading conditions: OBE and Fluid Transient

Note that SSE accelerations = 2.4*OBE accelerations

These accelerations are judged acceptable based on their very small magnitude (i.e. resultant acceleration is less than 1g for the upset condition.)

PIPING DISPLACEMENTS:

Displacements in excess of 2" are highlighted below for information. Only the maximum displacement and node in a given vicinity of piping are identified. Detailed displacement data at non support locations can be obtained from the computer run microfiche, Attachment 5. Detailed displacements at support locations can be obtained from the pipe support summary section, beginning on page 36.

Loading Condition	Range of nodes with displacements exceeding 2" in vicinity of maximum	Maximum Displacement(Node) x	y	z
OBE	160-205			2.4"(185)
SSE	135-230			5.8"(185)
Thermal	100-140			2.5"(115)
(583F)	160-390	-6.7"(265)		
	315-390			3.2"(345)

Note that displacements due to fluid transient are less than 2" in each global direction at all locations.

The above displacements are judged acceptable since adequate clearance exists between main steam lines A, B, C, and D and between the lines and structural components based on main steam piping drawing M-175 (ref. 11C).

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	~~PM-786~~ 1-1 R.1	N/A	34

SEE NOTE 14 FOR EVALUATION OF ADDITIONAL MSIV WEIGHT.

PENETRATION N-7D EVALUATION:

LOADS FROM ~~PM-786~~ 1-1 (Pipe Support Summary Section)

PEN. 7D LOAD	NODE	FORCE (LB) FX	FY	FZ	MOMENT (FT-LB) MX	MY	MZ
DW	(5)	14	-19374	-11	99833	330	-1491
THERM 583	(5)	926	-1622	-792	31136	7523	-10636
FT+	(5)	13806	43697	30473	221335	123683	166921
FT-	(5)	-14907	-31634	-21755	-169844	-129237	-159087
OBE	(5)	10317	15399	13144	122936	84908	106246
SSE	(5)	24761	36956	31547	295047	203779	254990
UPSET+		14746	24323	30462	352304	131536	165430
UPSET-		-14893	-52630	-22558	-70011	-128907	-171214
FAULTED+		25701	17582	31536	426016	211632	253499
FAULTED-		24775	-57952	-32350	-195214	-203449	-267117

LOADS FROM PREVIOUS ANALYSES 1-1W,S,T, D-007 (ref 20, 22)

PEN. 7D LOAD	NODE	FORCE (LB) FX	FY	FZ	MOMENT (FT-LB) MX	MY	MZ
DW	(5)	26	-15543	-17	115971	735	-1735
THERM 583	(5)	868	-698	-730	19015	7998	-9767
FT+	(110)	76482	19479	10029	1107900	683604	406132
FT-	(110)	-76482	-19479	-10029	-1107900	-683604	-406132
OBE	(133)	3987	8460	13132	97319	37999	44608
SSE	(133)	9569	20304	31517	233566	91198	107059
UPSET+		77376	3936	13115	1242886	692337	404397
UPSET-		-76456	-35720	-13879	-991929	-682869	-417634
FAULTED+		10463	4761	31500	368552	99931	105324
FAULTED-		-9543	-36545	-32264	-117595	-90463	-118561

RATIO OF UPSET LOADS (PREVIOUS ANALYSES/~~PM-786~~ 1-1)

UPSET+	5.2	0.2	0.4	3.5	5.3	2.4
UPSET-	5.1	0.7	0.6	14.2	5.3	2.4

Notes:

1. FT loads from calc D-007 are only tabulated/summarized in one direction. Therefore they are considered to be +/- in this evaluation.
2. The upset condition loading from the previous analyses is the dominant loading condition.
3. The impact of power rerate on the penetration loading is negligible as seen by the significant fluid transient loading from the previous analyses for the Fx, Mx, My, and Mz components. The significant load for these components is considered to offset the increase in the Fy, and Fz components.

MAIN STEAM STOP VALVE NO. 4 EVALUATION:

LOADS FROM ~~PM-786~~ 1-1 (Pipe Support Summary Section)

MSV-4		FORCE (LB)			MOMENT (FT-LB)		
LOAD	NODE	FX	FY	FZ	MX	MY	MZ
FT+	(390)	13806	847	30473	3420	123683	166921
FT-	(390)	-13471	-1046	-21755	-3742	-129237	-159087
OBE	(390)	7181	3488	8904	9790	160197	59496
SSE	(390)	17234	8371	21370	23496	384473	142790

LOADS FROM PREVIOUS ANALYSES 1-1S, D-007 (ref 20, 22)

MSV-4		FORCE (LB)			MOMENT (FT-LB)		
LOAD	NODE	FX	FY	FZ	MX	MY	MZ
FT+	(2)	18616	123	19518	5079	3591361	19520
FT-	(2)	-18616	-123	-19518	-5079	-3591361	-19520
OBE	(29)	3002	8586	7133	20970	188440	222040
SSE	(29)	7205	20606	17119	50328	452256	532896

RATIO OF LOADS (PREVIOUS ANALYSES/~~PM-786~~ 1-1)

UPSET+	1.3	2.5	0.6	2.1	22.4	1.3
UPSET-	1.4	2.5	0.9	2.1	22.4	1.4
SSE	0.4	2.5	0.8	2.1	1.2	3.7

Notes:

1. FT loads from calc D-007 are only tabulated/summarized in one direction. Therefore they are considered to be +/- in this evaluation.

2. Only dynamic loads are addressed in this evaluation since maximum temperature is unchanged at 583F and the differences in deadweight loading would only be due to modeling techniques and not due to power rerate conditions.

3. Calc 1-1S models all four main steam loops together and therefore does not have the MSV inlet directly restrained as is done in ~~PM-786~~. 1-1 Therefore member loads at node 29 from member 29 to 34 are used in this evaluation.

4. The impact of power rerate on the MSV-4 loading is negligible as seen by the significant FT or seimic loading from the previous analyses for the Fx, Fy, Mx, My, and Mz components. The load for these components is considered to offset the increase in the Fz component.

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	PM-786 1-1 R.1	N/A	36

PIPE SUPPORT LOAD SUMMARY:

JOB	Description	Pages
3762	All supports functioning	37-54
3823	Restraint no.5 non-functioning (uplift)	55-71

NOTES:

1. Cold loads, applied at spring hangers for deadweight analysis, are shown on page 23 of this calculation.

2. Pipe support evaluation shall use the maximum loading from JOBS 3762 and 3823.

3. Load combination LC#2 is erroneously identified as using the maximum value of DWT or (DWT + TH NORMAL). Actually, load combination LC#2 only uses the algebraic sum of DWT + TH NORMAL. If another load combination is desired the individual loads (i.e. DWT, THERMAL, FT, OBE) must be recombined manually.

4. 200 kip Grinnell snubber S7A (node 250) restrains both lines C and D. Therefore the load must be doubled for evaluation of the support. This is noted on pages 47, 64. Note that twice the maximum faulted load (2*108.4 = 216.8 kips) is within the capacity of the snubber (1.33*200=266 kips). The 1.33 factor applied to the normal capacity of the snubber is conservatively based on the smallest ratio of faulted to normal snubber capacities specified in Attachment 2 (Grinnell load data sheet).

****
* POINT NO. 5 *
* FUNCTION: ANCHOR *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* FLUED HEAD PEN N-7D *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7027.	14378.	769.	7796.

(FT) GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-11.00	138.15	45.00

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	353.	11.	-9727.	-6.	10411.	330.	-1265.	0.00	0.00	0.00	0.000	0.000	0.000
OBEI	10	4967.	-10317.	-15399.	-11849.	-57456.	-84908.	-106246.	0.00	0.00	0.00	0.000	0.000	0.000
OBEA	NOT SPECIFIED													
SSEI	11	11921.	-24761.	-36956.	-28438.	-137894.	-203779.	-254990.	0.00	0.00	0.00	0.000	0.000	0.000
NORM	2	715.	859.	2743.	-734.	-10457.	6992.	-9786.	0.00	0.00	0.00	0.000	0.000	0.000
THERANC	3	769.	924.	2951.	-790.	-11251.	7523.	-10529.	0.00	0.00	0.00	0.000	0.000	0.000
OCCMAX	4	7351.	-14907.	43697.	30473.	-167789.	-129237.	166921.	0.00	0.00	0.00	0.000	0.000	0.000
OCCMIN			10496.	-31634.	-21755.	121252.	86617.	-108247.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	15	567.	870.	-9727.	-741.	10411.	7322.	-11051.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	17	7782.	-15777.	-50681.	-31214.	-167835.	-136559.	-177972.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	18	12496.	-25696.	-46683.	-29235.	-148304.	-211632.	-266785.	0.00	0.00	0.00	0.000	0.000	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Att. 1, p37

****
* POINT NO. 41 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* RESTRAINT #5 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6674.	6674.	0.	6674.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-11.00	138.16	55.38

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	0.	0.	-10837.	0.	0.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
OBEI	10	0.	0.	-15807.	0.	0.	0.	0.	0.03	0.00	0.02	0.001	0.001	0.001
OBEA	NOT SPECIFIED													
SSEI	11	0.	0.	-37938.	0.	0.	0.	0.	0.06	0.00	0.04	0.003	0.002	0.004
NORM	2	0.	0.	-4390.	0.	0.	0.	0.	0.00	0.00	0.42	0.000	0.000	0.000
THERANC	3	0.	0.	-4724.	0.	0.	0.	0.	0.00	0.00	0.46	0.000	0.000	0.000
OCCMAX	4	0.	0.	-40395.	0.	0.	0.	0.	-0.04	0.00	-0.05	0.004	-0.001	0.002
OCCMIN			0.	32565.	0.	0.	0.	0.	0.03	0.00	0.04	-0.003	0.001	-0.002
MODFLEX	15	0.	0.	-15227.	0.	0.	0.	0.	0.00	0.00	0.42	0.000	0.000	0.000
MODFLEX	17	0.	0.	-55622.	0.	0.	0.	0.	0.04	0.00	0.47	0.004	0.001	0.003
MODFLEX	18	0.	0.	-53498.	0.	0.	0.	0.	0.06	0.00	0.49	0.003	0.002	0.004

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
App. 1, p38

****
* POINT NO. 75 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H1 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6997.	10589.	543.	7540.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-11.00	153.83	61.25

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	324.	0.	-19.	0.	0.	0.	0.	0.01	-0.01	0.01	0.000	0.000	0.000
OBEI	10	1952.	0.	-93.	0.	0.	0.	0.	0.34	0.06	0.25	0.001	0.001	0.001
OBEA	NOT SPECIFIED													
SSEI	11	4684.	0.	-224.	0.	0.	0.	0.	0.81	0.15	0.60	0.002	0.002	0.003
NORM	2	504.	0.	865.	0.	0.	0.	0.	0.03	0.58	0.75	0.001	0.000	0.000
THERANC	3	543.	0.	931.	0.	0.	0.	0.	0.04	0.62	0.81	0.001	0.000	0.000
OCCMAX	4	3592.	0.	-233.	0.	0.	0.	0.	-0.56	-0.16	0.73	0.001	0.000	0.002
OCCMIN			0.	176.	0.	0.	0.	0.	0.37	0.12	-0.53	-0.001	0.000	-0.001
MODFLEX	15	810.	0.	846.	0.	0.	0.	0.	0.04	0.56	0.76	0.001	0.000	0.000
MODFLEX	17	4387.	0.	-1079.	0.	0.	0.	0.	0.60	0.72	1.49	0.003	0.001	0.002
MODFLEX	18	5378.	0.	-1136.	0.	0.	0.	0.	0.86	0.76	1.41	0.003	0.002	0.003

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc 1-1 R.1
App. 1, p39

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 100 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1DB-H2 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6706.	11156.	845.	7551.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-11.00	153.83	91.39

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	33.	0.	-56.	0.	0.	0.	0.	0.02	-0.03	0.01	0.000	0.000	0.000
OBEI	10	3965.	0.	-169.	0.	0.	0.	0.	0.03	0.08	0.25	0.001	0.001	0.001
OBEA	NOT SPECIFIED													
SSEI	11	9516.	0.	-405.	0.	0.	0.	0.	0.08	0.19	0.60	0.001	0.003	0.001
NORM	2	786.	0.	258.	0.	0.	0.	0.	-0.04	0.12	1.99	0.001	0.000	0.000
THERANC	3	845.	0.	277.	0.	0.	0.	0.	-0.04	0.13	2.14	0.001	0.000	0.000
OCCMAX	4	4449.	0.	-264.	0.	0.	0.	0.	-0.06	-0.12	0.74	-0.001	0.002	0.001
OCCMIN			0.	208.	0.	0.	0.	0.	0.05	0.10	-0.54	0.001	-0.002	-0.001
MODFLEX	15	790.	0.	202.	0.	0.	0.	0.	-0.02	0.09	2.00	0.001	0.000	0.000
MODFLEX	17	5239.	0.	-466.	0.	0.	0.	0.	0.08	0.22	2.73	0.002	0.003	0.001
MODFLEX	18	10364.	0.	-626.	0.	0.	0.	0.	0.11	0.29	2.75	0.003	0.004	0.002

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. 1, p 40

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

* POINT NO. 105 *
* FUNCTION: SNUBBER *

* SUPPORT MARK NO. *
* 1DB-S2A *

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6756.	11393.	890.	7646.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-11.00	153.83	93.33

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	82.	0.	0.	0.	0.	0.	0.	0.02	-0.02	0.01	0.000	0.000	0.000
OBEI	10	4347.	-47626.	0.	0.	0.	0.	0.	0.00	0.06	0.25	0.001	0.002	0.001
OBEA	NOT SPECIFIED													
SSEI	11	10433.	-114303. *	0.	0.	0.	0.	0.	0.00	0.15	0.60	0.002	0.004	0.001
NORM	2	827.	0.	0.	0.	0.	0.	0.	-0.05	0.09	2.07	0.001	-0.001	0.000
THERANC	3	890.	0.	0.	0.	0.	0.	0.	-0.05	0.10	2.23	0.001	-0.001	0.000
OCCMAX	4	4637.	-58659.	0.	0.	0.	0.	0.	0.00	-0.10	0.74	-0.001	0.002	0.001
OCCMIN			34779.	0.	0.	0.	0.	0.	0.00	0.08	-0.54	0.001	-0.002	-0.001
MODFLEX	15	844.	0.	0.	0.	0.	0.	0.	-0.03	0.07	2.08	0.001	0.000	0.000
MODFLEX	17	5475.	-58659.	0.	0.	0.	0.	0.	0.03	0.17	2.82	0.002	0.003	0.001
MODFLEX	18	11328.	-114303. *	0.	0.	0.	0.	0.	0.04	0.23	2.83	0.003	0.004	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

* SEE NOTES 12a AND 12c. LOAD = 112,600 lb

Calc. 1-1 R.1
Att. 1, p 49

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

* POINT NO. 125 *
* FUNCTION: RESTRAINT *

* SUPPORT MARK NO. *
* 1DB-H3 *

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6957.	9738.	902.	7860.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-17.65	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	284.	0.	-4579.	0.	0.	0.	0.	0.02	0.00	0.01	0.000	0.000	0.000
OBEI	10	1874.	0.	-9091.	0.	0.	0.	0.	0.15	0.00	0.44	0.001	0.004	0.000
OBEA	NOT SPECIFIED													
SSEI	11	4499.	0.	-21818.	0.	0.	0.	0.	0.35	0.00	1.07	0.002	0.009	0.000
NORM	2	839.	0.	510.	0.	0.	0.	0.	-0.37	0.00	2.21	0.001	-0.002	0.000
THERANC	3	902.	0.	549.	0.	0.	0.	0.	-0.40	0.00	2.38	0.001	-0.002	0.000
OCCMAX	4	2781.	0.	-9279.	0.	0.	0.	0.	0.19	0.00	0.62	-0.001	-0.004	0.000
OCCMIN			0.	7504.	0.	0.	0.	0.	-0.18	0.00	-0.49	0.001	0.003	0.000
MODFLEX	15	887.	0.	-4579.	0.	0.	0.	0.	-0.36	0.00	2.22	0.001	-0.001	0.000
MODFLEX	17	3659.	0.	-13348.	0.	0.	0.	0.	0.55	0.00	2.84	0.002	0.005	0.000
MODFLEX	18	5424.	0.	-26397.	0.	0.	0.	0.	0.73	0.00	3.45	0.003	0.011	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. 1, p 42

***
*
NT *
*****

PIPE SUPPORT SUMMARY

SUPPORT MARK NO.
1DB-H4

AL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7282.	10768.	662.	7943.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-31.00	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	608.	0.	-9053.	0.	0.	0.	0.	0.02	0.00	0.01	0.000	0.000	0.000
OBEI	10	2108.	0.	-3830.	0.	0.	0.	0.	0.15	0.00	1.05	0.001	0.004	0.000
OBEA		NOT SPECIFIED												
SSEI	11	5059.	0.	-9192.	0.	0.	0.	0.	0.35	0.00	2.53	0.002	0.010	0.000
NORM	2	615.	0.	11.	0.	0.	0.	0.	-0.92	0.00	1.94	0.001	-0.002	0.000
THERANC	3	662.	0.	12.	0.	0.	0.	0.	-0.99	0.00	2.09	0.001	-0.002	0.000
OCCMAX	4	3486.	0.	-4370.	0.	0.	0.	0.	0.19	0.00	0.59	-0.001	-0.004	0.000
OCCMIN			0.	4073.	0.	0.	0.	0.	-0.19	0.00	-0.44	0.001	0.002	0.000
MODFLEX	15	862.	0.	-9053.	0.	0.	0.	0.	-0.91	0.00	1.95	0.001	-0.002	0.000
MODFLEX	17	4142.	0.	-13411.	0.	0.	0.	0.	1.10	0.00	3.00	0.002	0.006	0.000
MODFLEX	18	5771.	0.	-18245.	0.	0.	0.	0.	1.33	0.00	4.62	0.003	0.012	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc 1-1 R.1
Att. 1, p 43

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 170 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1D8-H5 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7621.	11299.	211.	7833.

(FT) GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-68.77	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	948.	0.	-12797.	0.	0.	0.	0.	0.02	0.00	0.02	0.000	0.000	0.000
OBEI	10	3677.	0.	-1458.	0.	0.	0.	0.	0.15	0.00	2.30	0.001	0.002	0.000
OBEA	NOT SPECIFIED													
SSEI	11	8826.	0.	-3499.	0.	0.	0.	0.	0.35	0.00	5.51	0.001	0.005	0.000
NORM	2	197.	0.	16.	0.	0.	0.	0.	-2.48	0.00	1.03	0.001	-0.002	0.000
THERANC	3	211.	0.	17.	0.	0.	0.	0.	-2.67	0.00	1.10	0.001	-0.002	0.000
OCCMAX	4	3527.	0.	-474.	0.	0.	0.	0.	0.20	0.00	-1.20	-0.001	0.002	0.000
OCCMIN			0.	413.	0.	0.	0.	0.	-0.20	0.00	0.76	0.001	-0.002	0.000
MODFLEX	15	963.	0.	-12797.	0.	0.	0.	0.	-2.46	0.00	1.04	0.001	-0.002	0.000
MODFLEX	17	3907.	0.	-14240.	0.	0.	0.	0.	2.66	0.00	3.34	0.001	0.005	0.000
MODFLEX	18	8994.	0.	-16297.	0.	0.	0.	0.	3.00	0.00	6.63	0.002	0.007	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
App. 1, p 44

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

****
* POINT NO. 210 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H6 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7549.	11646.	810.	8359.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-106.94	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	875.	0.	-12306.	0.	0.	0.	0.	0.02	0.00	0.02	0.000	0.000	0.000
OBEI	10	3453.	0.	-1823.	0.	0.	0.	0.	0.15	0.00	1.90	0.000	0.003	0.000
OBEA	NOT SPECIFIED													
SSEI	11	8286.	0.	-4376.	0.	0.	0.	0.	0.35	0.00	4.56	0.001	0.007	0.000
NORM	2	753.	0.	-63.	0.	0.	0.	0.	-4.05	0.00	0.14	0.001	-0.002	0.000
THERANC	3	810.	0.	-68.	0.	0.	0.	0.	-4.36	0.00	0.15	0.001	-0.002	0.000
OCCMAX	4	4097.	0.	429.	0.	0.	0.	0.	-0.21	0.00	-1.04	0.000	0.002	0.000
OCCMIN			0.	-321.	0.	0.	0.	0.	0.20	0.00	0.72	0.000	-0.002	0.000
MODFLEX	15	1163.	0.	-12369.	0.	0.	0.	0.	-4.03	0.00	0.16	0.000	-0.002	0.000
MODFLEX	17	4920.	0.	-14192.	0.	0.	0.	0.	4.24	0.00	2.06	0.001	0.005	0.000
MODFLEX	18	9175.	0.	-16749.	0.	0.	0.	0.	4.70	0.00	4.74	0.001	0.009	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
App. 1, p 45

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 240 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1D8-H7 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7537.	12681.	1508.	9045.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-144.93	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	863.	0.	-12440.	0.	0.	0.	0.	0.02	0.00	0.04	0.000	0.000	0.000
OBEI	10	5144.	0.	-2980.	0.	0.	0.	0.	0.15	0.00	0.27	0.000	0.004	0.000
OBEA	NOT SPECIFIED													
SSEI	11	12345.	0.	-7152.	0.	0.	0.	0.	0.36	0.00	0.65	0.001	0.009	0.000
NORM	2	1402.	0.	2.	0.	0.	0.	0.	-5.62	0.00	-0.35	0.000	0.000	0.000
THERANC	3	1508.	0.	2.	0.	0.	0.	0.	-6.04	0.00	-0.38	0.000	0.000	0.000
OCCMAX	4	3964.	0.	-624.	0.	0.	0.	0.	-0.21	0.00	0.22	0.000	-0.003	0.000
OCCMIN			0.	601.	0.	0.	0.	0.	0.20	0.00	-0.18	0.000	0.002	0.000
MODFLEX	15	1655.	0.	-12440.	0.	0.	0.	0.	-5.60	0.00	-0.32	0.000	0.000	0.000
MODFLEX	17	6665.	0.	-15418.	0.	0.	0.	0.	5.81	0.00	0.59	0.000	0.004	0.000
MODFLEX	18	13958.	0.	-19593.	0.	0.	0.	0.	6.38	0.00	0.99	0.001	0.009	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
APP 1, p46

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 250 *
* FUNCTION: SNUBBER *
****

****
* SUPPORT MARK NO. *
* 1D8-S7A *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6786.	12944.	1623.	8409.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-151.14	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	112.	0.	0.	0.	0.	0.	0.	0.02	0.00	0.04	0.000	0.000	0.000
OBEI	10	6158.	0.	0.	-45159.	0.	0.	0.	0.15	0.02	0.00	0.000	0.004	0.000
OBEA		NOT SPECIFIED												
SSEI	11	14780.	0.	0.	-108382.	0.	0.	0.	0.36	0.04	0.00	0.001	0.009	0.001
NORM	2	1508.	0.	0.	0.	0.	0.	0.	-5.87	0.00	-0.37	0.000	0.000	0.000
THERANC	3	1623.	0.	0.	0.	0.	0.	0.	-6.32	0.00	-0.40	0.000	0.000	0.000
OCCMAX	4	4532.	0.	0.	41710.	0.	0.	0.	-0.21	0.00	0.00	0.000	-0.003	0.000
OCCMIN			0.	0.	-36102.	0.	0.	0.	0.20	0.00	0.00	0.000	0.003	0.000
MODFLEX	15	1523.	0.	0.	0.	0.	0.	0.	-5.86	0.00	-0.33	0.000	0.000	0.000
MODFLEX	17	7675.	0.	0.	-45159.	0.	0.	0.	6.07	0.02	0.33	0.000	0.004	0.000
MODFLEX	18	16412.	0.	0.	-108382.	0.	0.	0.	6.66	0.05	0.36	0.001	0.009	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

SEE NOTE 4 ON PAGE 36, USE LOAD FACTOR OF 2.0

Calc. 1-1 R. 1 App. 1, p47

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 275 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1DB-H9B *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7133.	10047.	1545.	8677.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-160.33	153.83	110.75

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	459.	0.	-8687.	0.	0.	0.	0.	0.02	0.00	0.04	0.000	0.000	0.000
OBEI	10	2741.	0.	-3972.	0.	0.	0.	0.	0.17	0.00	0.38	0.000	0.001	0.000
OBEA	NOT SPECIFIED													
SSEI	11	6579.	0.	-9532.	0.	0.	0.	0.	0.41	0.00	0.90	0.001	0.002	0.000
NORM	2	1436.	0.	115.	0.	0.	0.	0.	-6.02	0.00	0.13	0.000	0.002	0.000
THERANC	3	1545.	0.	124.	0.	0.	0.	0.	-6.47	0.00	0.14	0.000	0.002	0.000
OCCMAX	4	2914.	0.	-840.	0.	0.	0.	0.	0.33	0.00	-0.33	0.000	-0.003	0.000
OCCMIN			0.	755.	0.	0.	0.	0.	-0.30	0.00	0.32	0.000	0.003	0.000
MODFLEX	15	1511.	0.	-8687.	0.	0.	0.	0.	-5.99	0.00	0.18	0.000	0.002	0.000
MODFLEX	17	4360.	0.	-12543.	0.	0.	0.	0.	6.32	0.00	0.55	0.000	0.005	0.000
MODFLEX	18	8187.	0.	-18219.	0.	0.	0.	0.	6.86	0.00	1.09	0.001	0.005	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
Att. 1, p 48

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 305 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1DB-H10 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7065.	12056.	877.	7941.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-160.33	153.83	141.40

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	391.	0.	136.	0.	0.	0.	0.	0.05	0.05	0.04	0.000	0.000	0.000
OBEI	10	1594.	0.	-463.	0.	0.	0.	0.	0.27	0.15	0.38	0.000	0.001	0.000
OBEA	NOT SPECIFIED													
SSEI	11	3825.	0.	-1111.	0.	0.	0.	0.	0.65	0.37	0.91	0.001	0.002	0.001
NORM	2	815.	0.	108.	0.	0.	0.	0.	-5.03	0.04	1.40	0.000	0.003	0.000
THERANC	3	877.	0.	116.	0.	0.	0.	0.	-5.42	0.04	1.50	0.000	0.003	0.000
OCCMAX	4	4991.	0.	-77.	0.	0.	0.	0.	-0.94	-0.03	-0.34	0.000	0.001	0.000
OCCMIN			0.	75.	0.	0.	0.	0.	0.88	0.03	0.33	0.000	-0.001	0.000
MODFLEX	15	904.	0.	243.	0.	0.	0.	0.	-4.99	0.08	1.44	0.000	0.003	0.000
MODFLEX	17	5808.	0.	-707.	0.	0.	0.	0.	5.92	0.24	1.82	0.001	0.004	0.001
MODFLEX	18	4779.	0.	-1363.	0.	0.	0.	0.	6.02	0.45	2.46	0.001	0.005	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. 1, p 49

****
* POINT NO. 325 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H11 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7169.	9980.	341.	7510.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-160.33	153.83	165.59

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	495.	0.	215.	0.	0.	0.	0.	0.07	0.10	0.04	0.000	0.000	0.000
OBEI	10	1684.	0.	-354.	0.	0.	0.	0.	0.20	0.16	0.38	0.000	0.001	0.000
OBEA	NOT SPECIFIED													
SSEI	11	4043.	0.	-849.	0.	0.	0.	0.	0.47	0.39	0.91	0.001	0.002	0.001
NORM	2	317.	0.	215.	0.	0.	0.	0.	-4.05	0.10	2.39	0.000	0.004	0.000
THERANC	3	341.	0.	231.	0.	0.	0.	0.	-4.36	0.11	2.58	0.000	0.004	0.000
OCCMAX	4	2811.	0.	-48.	0.	0.	0.	0.	-0.60	-0.02	-0.34	0.000	0.003	0.000
OCCMIN			0.	45.	0.	0.	0.	0.	0.51	0.02	0.33	0.000	-0.002	0.000
MODFLEX	15	598.	0.	430.	0.	0.	0.	0.	-3.99	0.20	2.44	0.000	0.004	-0.001
MODFLEX	17	3154.	0.	-784.	0.	0.	0.	0.	4.59	0.36	2.82	0.001	0.006	0.001
MODFLEX	18	4511.	0.	-1295.	0.	0.	0.	0.	4.77	0.60	3.53	0.001	0.006	0.002

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
App. I, p50

****
* POINT NO. 340 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H12 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7161.	8587.	107.	7268.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-160.33	153.83	178.56

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	487.	0.	335.	0.	0.	0.	0.	0.08	0.11	0.04	0.000	0.000	0.000
OBEI	10	1190.	0.	-499.	0.	0.	0.	0.	0.06	0.17	0.38	0.000	0.001	0.001
OBEA	NOT SPECIFIED													
SSEI	11	2855.	0.	-1197.	0.	0.	0.	0.	0.14	0.40	0.91	0.001	0.002	0.001
NORM	2	99.	0.	416.	0.	0.	0.	0.	-3.49	0.14	2.93	0.000	0.004	0.000
THERANC	3	107.	0.	448.	0.	0.	0.	0.	-3.76	0.15	3.15	0.000	0.004	0.000
OCCMAX	4	1426.	0.	-79.	0.	0.	0.	0.	-0.13	-0.03	-0.34	0.000	0.003	0.000
OCCMIN			0.	78.	0.	0.	0.	0.	0.12	0.03	0.33	0.000	-0.003	0.000
MODFLEX	15	572.	0.	750.	0.	0.	0.	0.	-3.42	0.25	2.97	0.000	0.004	-0.001
MODFLEX	17	1593.	0.	-1249.	0.	0.	0.	0.	3.55	0.42	3.35	0.001	0.007	0.001
MODFLEX	18	3067.	0.	-1979.	0.	0.	0.	0.	3.82	0.66	4.10	0.001	0.006	0.002

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
All 1, PSI

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

****
* POINT NO. 370 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H13 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6752.	9198.	651.	7402.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-140.31	153.83	183.00

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	78.	0.	60.	0.	0.	0.	0.	0.08	0.02	0.03	0.000	0.000	0.000
OBEI	10	2447.	0.	-67.	0.	0.	0.	0.	0.00	0.03	0.07	0.000	0.001	0.000
OBEA	NOT SPECIFIED													
SSEI	11	5872.	0.	-160.	0.	0.	0.	0.	0.00	0.07	0.16	0.000	0.002	0.001
NORM	2	605.	0.	137.	0.	0.	0.	0.	-2.47	0.06	2.26	0.000	0.003	0.000
THERANC	3	651.	0.	148.	0.	0.	0.	0.	-2.66	0.06	2.43	0.000	0.004	-0.001
OCCMAX	4	1961.	0.	12.	0.	0.	0.	0.	0.00	0.00	0.06	0.000	0.001	0.000
OCCMIN			0.	-11.	0.	0.	0.	0.	0.00	0.00	-0.04	0.000	-0.001	0.000
MODFLEX	15	604.	0.	197.	0.	0.	0.	0.	-2.39	0.08	2.29	0.000	0.004	-0.001
MODFLEX	17	3009.	0.	-263.	0.	0.	0.	0.	2.40	0.11	2.36	0.000	0.005	0.001
MODFLEX	18	6471.	0.	-367.	0.	0.	0.	0.	2.58	0.15	2.62	0.000	0.006	0.002

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
Att. 1, p52

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

****
* POINT NO. 390 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* MSU-4 INLET *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7247.	13371.	1720.	8966.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-131.70	153.83	183.00

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	275.	0.	809.	0.	3412.	0.	0.	0.08	0.00	0.02	0.000	0.000	0.000
OBEI	10	216.	0.	-3488.	0.	-9356.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
OBEA	NOT SPECIFIED													
SSEI	11	519.	0.	-8372.	0.	-22454.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
NORM	2	600.	0.	-2523.	0.	3766.	0.	0.	-2.12	0.00	1.91	0.000	0.003	-0.001
THERANC	3	646.	0.	-2714.	0.	4053.	0.	0.	-2.28	0.00	2.05	0.000	0.004	-0.001
OCCMAX	4	119.	0.	658.	0.	2702.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
OCCMIN			0.	-647.	0.	-2067.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	15	502.	0.	-1714.	0.	7178.	0.	0.	-2.04	0.00	1.93	0.000	0.003	-0.001
MODFLEX	17	623.	0.	-5202.	0.	-16534.	0.	0.	2.04	0.00	1.93	0.000	0.004	0.001
MODFLEX	18	996.	0.	-10277.	0.	-29918.	0.	0.	2.20	0.00	2.08	0.000	0.004	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
App. I, p53

****
* POINT NO. 390 *
* FUNCTION: SNUBBER *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* MSV-4 (INLET) *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7247.	13371.	1720.	8966.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-131.70	153.83	183.00

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	275.	0.	0.	0.	0.	0.	0.	0.08	0.00	0.02	0.000	0.000	0.000
OBEI	10	216.	-7070.	0.	-8904.	0.	-160197.	-59496.	0.00	0.00	0.00	0.000	0.000	0.000
OBEA	NOT SPECIFIED													
SSEI	11	519.	-16967.	0.	-21369.	0.	-384472.	-142791.	0.00	0.00	0.00	0.000	0.000	0.000
NORM	2	600.	0.	0.	0.	0.	0.	0.	-2.12	0.00	1.91	0.000	0.003	-0.001
THERANC	3	646.	0.	0.	0.	0.	0.	0.	-2.28	0.00	2.05	0.000	0.004	-0.001
OCCMAX	4	119.	21099.	0.	9056.	0.	145276.	-10567.	0.00	0.00	0.00	0.000	0.000	0.000
OCCMIN			-15658.	0.	-6323.	0.	-101216.	9890.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	15	502.	0.	0.	0.	0.	0.	0.	-2.04	0.00	1.93	0.000	0.003	-0.001
MODFLEX	17	623.	-21099.	0.	-9056.	0.	-160197.	-59496.	2.04	0.00	1.93	0.000	0.004	0.001
MODFLEX	18	996.	-16967.	0.	-21369.	0.	-384472.	-142791.	2.20	0.00	2.08	0.000	0.004	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc - 1-1 R.1
APP. 1, p54

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 5 *
* FUNCTION: ANCHOR *
****

****
* SUPPORT MARK NO. *
* FLUED HEAD PEN N-7D *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
10033.	19268.	1513.	11546.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-11.00	138.15	45.00

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	3359.	14.	-19374.	-11.	99833.	190.	-1491.	0.00	0.00	0.00	0.000	0.000	0.000
OBEI	10	6112.	-10042.	-13731.	-13144.	-122936.	-82962.	-104916.	0.00	0.00	0.00	0.000	0.000	0.000
OBEA	NOT SPECIFIED													
SSEI	11	14668.	-24102.	-32953.	-31547.	-295047.	-199110.	-251797.	0.00	0.00	0.00	0.000	0.000	0.000
NORM	2	1407.	860.	-1507.	-737.	28938.	6930.	-9885.	0.00	0.00	0.00	0.000	0.000	0.000
THERANC	3	1513.	926.	-1622.	-792.	31136.	7457.	-10636.	0.00	0.00	0.00	0.000	0.000	0.000
OCCMAX	4	9235.	13806.	14991.	23713.	221335.	123683.	-159087.	0.00	0.00	0.00	0.000	0.000	0.000
OCCMIN			-13471.	-8853.	-18742.	-169844.	-113924.	149699.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	15	4356.	875.	-20881.	-747.	128771.	7120.	-11376.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	17	12845.	-14681.	-35872.	-24460.	-350106.	-130803.	-170463.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	18	18239.	-25042.	-53949.	-32350.	-426016.	-206756.	-263924.	0.00	0.00	0.00	0.001	0.000	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. I, p55

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

****
* POINT NO. 75 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H1 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6793.	10950.	453.	7246.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-11.00	153.83	61.25

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	119.	0.	-80.	0.	0.	0.	0.	0.01	-0.05	0.06	0.000	0.000	0.000
OBEI	10	2133.	0.	-197.	0.	0.	0.	0.	0.34	0.13	0.32	0.001	0.001	0.001
OBEA	NOT SPECIFIED													
SSEI	11	5120.	0.	-472.	0.	0.	0.	0.	0.81	0.31	0.76	0.002	0.002	0.003
NORM	2	421.	0.	838.	0.	0.	0.	0.	0.03	0.56	0.77	0.001	0.000	0.000
THERANC	3	453.	0.	901.	0.	0.	0.	0.	0.04	0.60	0.83	0.001	0.000	0.000
OCCMAX	4	4157.	0.	-441.	0.	0.	0.	0.	0.58	-0.29	0.79	0.001	0.000	-0.002
OCCMIN			0.	328.	0.	0.	0.	0.	-0.52	0.22	-0.57	-0.001	0.000	0.002
MODFLEX	15	524.	0.	757.	0.	0.	0.	0.	0.04	0.50	0.83	0.001	0.000	0.000
MODFLEX	17	4671.	0.	-1199.	0.	0.	0.	0.	0.62	0.80	1.61	0.003	0.001	0.002
MODFLEX	18	5630.	0.	-1294.	0.	0.	0.	0.	0.85	0.86	1.65	0.003	0.002	0.003

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R-1
App 1, p58

****
* POINT NO. 100 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H2 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6728.	11850.	850.	7578.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-11.00	153.83	91.39

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	55.	0.	-82.	0.	0.	0.	0.	0.01	-0.04	0.06	0.000	0.000	0.000
OBEI	10	3910.	0.	-234.	0.	0.	0.	0.	0.04	0.11	0.32	0.001	0.001	0.001
OBEA	NOT SPECIFIED													
SSEI	11	9384.	0.	-563.	0.	0.	0.	0.	0.08	0.26	0.76	0.002	0.003	0.001
NORM	2	790.	0.	246.	0.	0.	0.	0.	-0.04	0.11	2.01	0.001	0.000	0.000
THERANC	3	850.	0.	265.	0.	0.	0.	0.	-0.04	0.12	2.17	0.001	-0.001	0.000
OCCMAX	4	5122.	0.	-407.	0.	0.	0.	0.	0.08	-0.19	0.79	-0.001	-0.003	-0.001
OCCMIN			0.	292.	0.	0.	0.	0.	-0.06	0.14	-0.57	0.001	0.003	0.001
MODFLEX	15	804.	0.	165.	0.	0.	0.	0.	-0.02	0.08	2.07	0.001	0.000	0.000
MODFLEX	17	5925.	0.	-572.	0.	0.	0.	0.	0.10	0.26	2.86	0.002	0.004	0.001
MODFLEX	18	10245.	0.	-746.	0.	0.	0.	0.	0.11	0.35	2.99	0.003	0.004	0.002

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R-1
All, p57

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 105 *
* FUNCTION: SNUBBER *
****

****
* SUPPORT MARK NO. *
* 1DB-S2A *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6771.	12030.	894.	7666.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-11.00	153.83	93.33

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	98.	0.	0.	0.	0.	0.	0.	0.01	-0.03	0.06	0.000	0.000	0.000
OBEI	10	4283.	-46797.	0.	0.	0.	0.	0.	0.00	0.09	0.32	0.001	0.002	0.001
OBEA		NOT SPECIFIED												
SSEI	11	10279.	-112312.	0.	0.	0.	0.	0.	0.00	0.21	0.76	0.002	0.004	0.001
NORM	2	831.	0.	0.	0.	0.	0.	0.	-0.05	0.08	2.09	0.001	-0.001	0.000
THERANC	3	894.	0.	0.	0.	0.	0.	0.	-0.05	0.09	2.25	0.001	-0.001	0.000
OCCMAX	4	5259.	-61204.	0.	0.	0.	0.	0.	0.00	-0.15	0.79	-0.002	-0.003	-0.001
OCCMIN			39393.	0.	0.	0.	0.	0.	0.00	0.11	-0.57	0.001	0.003	0.001
MODFLEX	15	858.	0.	0.	0.	0.	0.	0.	-0.04	0.05	2.15	0.001	-0.001	0.000
MODFLEX	17	6115.	-61204.	0.	0.	0.	0.	0.	0.04	0.21	2.94	0.002	0.004	0.001
MODFLEX	18	11186.	-112312.	0.	0.	0.	0.	0.	0.04	0.27	3.07	0.003	0.004	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
A11-1, p58

****
* POINT NO. 125 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H3 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6991.	9864.	904.	7895.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-17.65	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	317.	0.	-4924.	0.	0.	0.	0.	0.01	0.00	0.06	0.000	0.000	0.000
OBEI	10	2029.	0.	-11665.	0.	0.	0.	0.	0.15	0.00	0.53	0.001	0.004	0.000
OBEA	NOT SPECIFIED													
SSEI	11	4870.	0.	-27997.	0.	0.	0.	0.	0.35	0.00	1.27	0.003	0.009	0.000
NORM	2	840.	0.	358.	0.	0.	0.	0.	-0.37	0.00	2.23	0.001	-0.002	0.000
THERANC	3	904.	0.	385.	0.	0.	0.	0.	-0.40	0.00	2.40	0.001	-0.002	0.000
OCCMAX	4	2872.	0.	-15083.	0.	0.	0.	0.	-0.28	0.00	0.59	-0.001	-0.004	0.000
OCCMIN			0.	10842.	0.	0.	0.	0.	0.20	0.00	-0.46	0.001	0.003	0.000
MODFLEX	15	907.	0.	-4924.	0.	0.	0.	0.	-0.36	0.00	2.29	0.001	-0.002	0.000
MODFLEX	17	3771.	0.	-19649.	0.	0.	0.	0.	0.64	0.00	2.87	0.002	0.006	0.000
MODFLEX	18	5812.	0.	-32921.	0.	0.	0.	0.	0.74	0.00	3.72	0.003	0.011	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1, R-1
App. 1, p59

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 140 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1DB-H4 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7278.	10444.	662.	7940.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-31.00	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	605.	0.	-8931.	0.	0.	0.	0.	0.01	0.00	0.06	0.000	0.000	0.000
OBEI	10	2166.	0.	-4542.	0.	0.	0.	0.	0.15	0.00	1.13	0.001	0.004	0.000
OBEA		NOT SPECIFIED												
SSEI	11	5197.	0.	-10900.	0.	0.	0.	0.	0.35	0.00	2.71	0.002	0.010	0.000
NORM	2	615.	0.	65.	0.	0.	0.	0.	-0.92	0.00	1.96	0.001	-0.002	0.000
THERANC	3	662.	0.	70.	0.	0.	0.	0.	-0.99	0.00	2.11	0.001	-0.002	0.000
OCCMAX	4	3166.	0.	6474.	0.	0.	0.	0.	-0.28	0.00	0.60	-0.001	-0.004	0.000
OCCMIN			0.	-6224.	0.	0.	0.	0.	0.21	0.00	-0.48	0.001	0.003	0.000
MODFLEX	15	860.	0.	-8931.	0.	0.	0.	0.	-0.91	0.00	2.02	0.001	-0.002	0.000
MODFLEX	17	3842.	0.	-15339.	0.	0.	0.	0.	1.19	0.00	3.15	0.002	0.006	0.000
MODFLEX	18	5919.	0.	-19831.	0.	0.	0.	0.	1.33	0.00	4.88	0.003	0.012	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
App. 1, p 60

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 170 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1DB-H5 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7624.	11950.	204.	7827.

(FT) GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-68.77	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	950.	0.	-12810.	0.	0.	0.	0.	0.01	0.00	0.05	0.000	0.000	0.000
OBEI	10	3730.	0.	-1531.	0.	0.	0.	0.	0.15	0.00	2.35	0.001	0.002	0.000
OBEA		NOT SPECIFIED												
SSEI	11	8952.	0.	-3674.	0.	0.	0.	0.	0.36	0.00	5.65	0.002	0.005	0.000
NORM	2	189.	0.	10.	0.	0.	0.	0.	-2.48	0.00	1.04	0.001	-0.002	0.000
THERANC	3	204.	0.	11.	0.	0.	0.	0.	-2.67	0.00	1.12	0.001	-0.002	0.000
OCCMAX	4	4327.	0.	737.	0.	0.	0.	0.	-0.29	0.00	-1.19	-0.001	0.002	0.000
OCCMIN			0.	-695.	0.	0.	0.	0.	0.21	0.00	0.94	0.001	-0.002	0.000
MODFLEX	15	961.	0.	-12810.	0.	0.	0.	0.	-2.47	0.00	1.09	0.001	-0.002	0.000
MODFLEX	17	4506.	0.	-14330.	0.	0.	0.	0.	2.75	0.00	3.45	0.002	0.004	0.000
MODFLEX	18	9120.	0.	-16483.	0.	0.	0.	0.	3.01	0.00	6.82	0.002	0.007	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R-1
App. 1, p61

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

PIPE SUPPORT SUMMARY

****
* POINT NO. 210 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1DB-H6 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7547.	11880.	810.	8356.

(FT) GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-106.94	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	873.	0.	-12285.	0.	0.	0.	0.	0.01	0.00	0.05	0.000	0.000	0.000
OBEI	10	3434.	0.	-1873.	0.	0.	0.	0.	0.15	0.00	1.94	0.001	0.003	0.000
OBEA		NOT SPECIFIED												
SSEI	11	8241.	0.	-4494.	0.	0.	0.	0.	0.36	0.00	4.66	0.001	0.007	0.000
NORM	2	753.	0.	-54.	0.	0.	0.	0.	-4.05	0.00	0.15	0.001	-0.002	0.000
THERANC	3	810.	0.	-58.	0.	0.	0.	0.	-4.36	0.00	0.16	0.001	-0.002	0.000
OCCMAX	4	4334.	0.	-961.	0.	0.	0.	0.	-0.29	0.00	-1.06	-0.001	-0.002	0.000
OCCMIN			0.	829.	0.	0.	0.	0.	0.21	0.00	1.01	0.001	0.002	0.000
MODFLEX	15	1159.	0.	-12339.	0.	0.	0.	0.	-4.04	0.00	0.20	0.000	-0.002	0.000
MODFLEX	17	5157.	0.	-14211.	0.	0.	0.	0.	4.33	0.00	2.14	0.001	0.005	0.000
MODFLEX	18	9135.	0.	-16837.	0.	0.	0.	0.	4.71	0.00	4.87	0.002	0.009	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. 1, p62

****
* POINT NO. 240 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H7 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7548.	12457.	1510.	9059.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-144.93	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	875.	0.	-12492.	0.	0.	0.	0.	0.01	0.00	0.05	0.000	0.000	0.000
OBEI	10	4909.	0.	-2988.	0.	0.	0.	0.	0.15	0.00	0.27	0.000	0.004	0.000
OBEA		NOT SPECIFIED												
SSEI	11	11781.	0.	-7172.	0.	0.	0.	0.	0.36	0.00	0.66	0.001	0.009	0.000
NORM	2	1404.	0.	-20.	0.	0.	0.	0.	-5.62	0.00	-0.35	0.000	0.000	0.000
THERANC	3	1510.	0.	-22.	0.	0.	0.	0.	-6.05	0.00	-0.37	0.000	0.000	0.000
OCCMAX	4	3955.	0.	-1141.	0.	0.	0.	0.	-0.30	0.00	0.24	0.000	-0.003	0.000
OCCMIN			0.	1122.	0.	0.	0.	0.	0.21	0.00	-0.21	0.000	0.003	0.000
MODFLEX	15	1667.	0.	-12512.	0.	0.	0.	0.	-5.60	0.00	-0.30	0.000	0.000	0.000
MODFLEX	17	6447.	0.	-15500.	0.	0.	0.	0.	5.90	0.00	0.57	0.000	0.004	0.000
MODFLEX	18	13410.	0.	-19686.	0.	0.	0.	0.	6.39	0.00	0.98	0.001	0.009	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 11-1 R-1
App-1, p63

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

****
* POINT NO. 250 *
* FUNCTION: SNUBBER *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-S7A *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6797.	12663.	1626.	8423.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-151.14	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	123.	0.	0.	0.	0.	0.	0.	0.01	-0.01	0.05	0.000	0.000	0.000
OBEI	10	5866.	0.	0.	-42514.	0.	0.	0.	0.15	0.02	0.00	0.000	0.004	0.000
OBEA		NOT SPECIFIED												
SSEI	11	14079.	0.	0.	-102034.	0.	0.	0.	0.36	0.04	0.00	0.001	0.009	0.001
NORM	2	1511.	0.	0.	0.	0.	0.	0.	-5.87	0.00	-0.37	0.000	0.000	0.000
THERANC	3	1626.	0.	0.	0.	0.	0.	0.	-6.32	0.00	-0.39	0.000	0.000	0.000
OCCMAX	4	4586.	0.	0.	41265.	0.	0.	0.	-0.30	0.01	0.00	0.000	-0.003	0.000
OCCMIN			0.	0.	-34971.	0.	0.	0.	0.21	0.00	0.00	0.000	0.003	0.000
MODFLEX	15	1533.	0.	0.	0.	0.	0.	0.	-5.86	-0.01	-0.31	0.000	0.000	0.000
MODFLEX	17	7395.	0.	0.	-42514.	0.	0.	0.	6.16	0.02	0.32	0.000	0.004	0.000
MODFLEX	18	15723.	0.	0.	-102034.	0.	0.	0.	6.67	0.05	0.34	0.001	0.009	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

SEE NOTE 4 IN PAGE 36, USE LOAD FACTOR OF 2.0

Calc. 1-1 R.1
App. 1, p64

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

****
* POINT NO. 275 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H9B *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7141.	9974.	1548.	8689.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-160.33	153.83	110.75

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	468.	0.	-8657.	0.	0.	0.	0.	0.02	0.00	0.05	0.000	0.000	0.000
OBEI	10	2686.	0.	-3960.	0.	0.	0.	0.	0.18	0.00	0.38	0.000	0.001	0.000
OBEA	NOT SPECIFIED													
SSEI	11	6446.	0.	-9503.	0.	0.	0.	0.	0.44	0.00	0.91	0.001	0.002	0.000
NORM	2	1439.	0.	128.	0.	0.	0.	0.	-6.02	0.00	0.14	0.000	0.002	0.000
THERANC	3	1548.	0.	138.	0.	0.	0.	0.	-6.47	0.00	0.15	0.000	0.002	0.000
OCCMAX	4	2833.	0.	1110.	0.	0.	0.	0.	0.43	0.00	-0.34	0.000	0.004	0.000
OCCMIN			0.	-1036.	0.	0.	0.	0.	-0.36	0.00	0.33	0.000	-0.004	0.000
MODFLEX	15	1525.	0.	-8657.	0.	0.	0.	0.	-6.00	0.00	0.19	0.000	0.002	0.000
MODFLEX	17	4293.	0.	-12489.	0.	0.	0.	0.	6.43	0.00	0.57	0.000	0.006	0.000
MODFLEX	18	8068.	0.	-18160.	0.	0.	0.	0.	6.90	0.00	1.11	0.001	0.004	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
Att. 1, p65

****
* POINT NO. 305 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1D8-H10 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7068.	13235.	879.	7948.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-160.33	153.83	141.40

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	395.	0.	138.	0.	0.	0.	0.	0.04	0.05	0.05	0.000	0.000	0.000
OBEI	10	1595.	0.	-455.	0.	0.	0.	0.	0.31	0.15	0.38	0.000	0.001	0.000
OBEA	NOT SPECIFIED													
SSEI	11	3828.	0.	-1092.	0.	0.	0.	0.	0.74	0.36	0.91	0.001	0.002	0.001
NORM	2	817.	0.	108.	0.	0.	0.	0.	-5.04	0.04	1.40	0.000	0.003	0.000
THERANC	3	879.	0.	117.	0.	0.	0.	0.	-5.42	0.04	1.51	0.000	0.003	0.000
OCCMAX	4	6167.	0.	83.	0.	0.	0.	0.	-1.22	0.03	-0.34	0.000	0.001	0.000
OCCMIN			0.	-73.	0.	0.	0.	0.	1.21	-0.02	0.33	0.000	-0.001	0.000
MODFLEX	15	914.	0.	246.	0.	0.	0.	0.	-4.99	0.08	1.46	0.000	0.003	0.000
MODFLEX	17	6992.	0.	-701.	0.	0.	0.	0.	6.22	0.23	1.84	0.001	0.004	0.001
MODFLEX	18	4792.	0.	-1346.	0.	0.	0.	0.	6.11	0.45	2.47	0.001	0.005	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
Att-1, p66

****
* POINT NO. 325 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H11 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7170.	9956.	343.	7513.

(FT) GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-160.33	153.83	165.59

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	496.	0.	216.	0.	0.	0.	0.	0.06	0.10	0.05	0.000	0.000	0.000
OBEI	10	1628.	0.	-308.	0.	0.	0.	0.	0.19	0.14	0.38	0.000	0.001	0.000
OBEA		NOT SPECIFIED												
SSEI	11	3907.	0.	-740.	0.	0.	0.	0.	0.47	0.34	0.91	0.001	0.002	0.001
NORM	2	319.	0.	215.	0.	0.	0.	0.	-4.05	0.10	2.40	0.000	0.004	0.000
THERANC	3	343.	0.	231.	0.	0.	0.	0.	-4.36	0.11	2.58	0.000	0.004	0.000
OCCMAX	4	2786.	0.	42.	0.	0.	0.	0.	-0.72	0.02	-0.34	0.000	0.003	0.000
OCCMIN			0.	-41.	0.	0.	0.	0.	0.64	-0.02	0.33	0.000	-0.003	0.000
MODFLEX	15	603.	0.	431.	0.	0.	0.	0.	-3.99	0.20	2.45	0.000	0.004	-0.001
MODFLEX	17	3145.	0.	-739.	0.	0.	0.	0.	4.71	0.34	2.83	0.001	0.007	0.001
MODFLEX	18	4383.	0.	-1187.	0.	0.	0.	0.	4.77	0.55	3.55	0.001	0.006	0.002

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
App. 1, p 67

****
* POINT NO. 340 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1D8-H12 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7161.	9437.	108.	7268.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-160.33	153.83	178.56

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	487.	0.	334.	0.	0.	0.	0.	0.08	0.11	0.05	0.000	0.000	0.000
OBEI	10	1190.	0.	-488.	0.	0.	0.	0.	0.05	0.16	0.38	0.000	0.001	0.001
OBEA	NOT SPECIFIED													
SSEI	11	2856.	0.	-1170.	0.	0.	0.	0.	0.13	0.39	0.91	0.001	0.002	0.001
NORM	2	100.	0.	416.	0.	0.	0.	0.	-3.49	0.14	2.93	0.000	0.004	0.000
THERANC	3	108.	0.	447.	0.	0.	0.	0.	-3.76	0.15	3.16	0.000	0.004	0.000
OCCMAX	4	2276.	0.	-88.	0.	0.	0.	0.	-0.15	-0.03	-0.34	0.000	0.004	0.000
OCCMIN			0.	73.	0.	0.	0.	0.	0.14	0.02	0.33	0.000	-0.003	0.000
MODFLEX	15	572.	0.	750.	0.	0.	0.	0.	-3.42	0.25	2.99	0.000	0.004	-0.001
MODFLEX	17	2404.	0.	-1237.	0.	0.	0.	0.	3.57	0.41	3.37	0.001	0.007	0.001
MODFLEX	18	3067.	0.	-1952.	0.	0.	0.	0.	3.81	0.65	4.12	0.001	0.006	0.002

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. I, p68

****
* POINT NO. 370 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H13 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
6753.	9200.	650.	7403.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-140.31	153.83	183.00

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	79.	0.	59.	0.	0.	0.	0.	0.08	0.02	0.04	0.000	0.000	0.000
OBEI	10	2447.	0.	-66.	0.	0.	0.	0.	0.00	0.03	0.07	0.000	0.001	0.000
OBEA	NOT SPECIFIED													
SSEI	11	5872.	0.	-157.	0.	0.	0.	0.	0.00	0.07	0.16	0.000	0.002	0.001
NORM	2	604.	0.	137.	0.	0.	0.	0.	-2.48	0.06	2.26	0.000	0.003	0.000
THERANC	3	650.	0.	147.	0.	0.	0.	0.	-2.66	0.06	2.43	0.000	0.004	-0.001
OCCMAX	4	1977.	0.	-15.	0.	0.	0.	0.	0.00	-0.01	0.06	0.000	0.001	0.000
OCCMIN			0.	12.	0.	0.	0.	0.	0.00	0.01	-0.06	0.000	-0.001	0.000
MODFLEX	15	603.	0.	196.	0.	0.	0.	0.	-2.40	0.08	2.30	0.000	0.004	-0.001
MODFLEX	17	3006.	0.	-262.	0.	0.	0.	0.	2.40	0.11	2.37	0.000	0.005	0.001
MODFLEX	18	6468.	0.	-364.	0.	0.	0.	0.	2.58	0.15	2.64	0.000	0.006	0.002

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. 1, p69

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

****
* POINT NO. 390 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* MSV-4 INLET *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7249.	13354.	1719.	8967.

GLOBAL COORDINATES (FT)

X COORD	Y COORD	Z COORD
-131.70	153.83	183.00

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	276.	0.	814.	0.	3541.	0.	0.	0.08	0.00	0.03	0.000	0.000	0.000
OBEI	10	214.	0.	-3453.	0.	-9790.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
OBEA	NOT SPECIFIED													
SSEI	11	513.	0.	-8286.	0.	-23495.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
NORM	2	600.	0.	-2521.	0.	3823.	0.	0.	-2.12	0.00	1.91	0.000	0.003	-0.001
THERANC	3	646.	0.	-2712.	0.	4114.	0.	0.	-2.28	0.00	2.06	0.000	0.004	-0.001
OCCMAX	4	119.	0.	-1046.	0.	-3742.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
OCCMIN			0.	847.	0.	3420.	0.	0.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	15	504.	0.	-1707.	0.	7364.	0.	0.	-2.04	0.00	1.94	0.000	0.003	-0.001
MODFLEX	17	622.	0.	-5159.	0.	-17154.	0.	0.	2.04	0.00	1.94	0.000	0.004	0.001
MODFLEX	18	992.	0.	-10185.	0.	-31150.	0.	0.	2.20	0.00	2.09	0.000	0.004	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. 1, p 70

****
* POINT NO. 390 *
* FUNCTION: SNUBBER *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* MSV-4 (INLET) *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7249.	13354.	1719.	8967.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-131.70	153.83	183.00

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	276.	0.	0.	0.	0.	0.	0.	0.08	0.00	0.03	0.000	0.000	0.000
OBEI	10	214.	-7181.	0.	-8805.	0.	-159991.	-58664.	0.00	0.00	0.00	0.000	0.000	0.000
OBEA	NOT SPECIFIED													
SSEI	11	513.	-17234.	0.	-21132.	0.	-383979.	-140794.	0.00	0.00	0.00	0.000	0.000	0.000
NORM	2	600.	0.	0.	0.	0.	0.	0.	-2.12	0.00	1.91	0.000	0.003	-0.001
THERANC	3	646.	0.	0.	0.	0.	0.	0.	-2.28	0.00	2.06	0.000	0.004	-0.001
OCCMAX	4	119.	21112.	0.	10543.	0.	146139.	14081.	0.00	0.00	0.00	0.000	0.000	0.000
OCCMIN			-17488.	0.	-7220.	0.	-128094.	-11119.	0.00	0.00	0.00	0.000	0.000	0.000
MODFLEX	15	504.	0.	0.	0.	0.	0.	0.	-2.04	0.00	1.94	0.000	0.003	-0.001
MODFLEX	17	622.	-21112.	0.	-10543.	0.	-159991.	-58664.	2.04	0.00	1.94	0.000	0.004	0.001
MODFLEX	18	992.	-17234.	0.	-21132.	0.	-383979.	-140794.	2.20	0.00	2.09	0.000	0.004	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
Att. 1, p21

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

▲5010.65P

CALCULATION IDENTIFICATION NUMBER				PAGE
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	App. 1
03040	NP (C)	~~PM~~ ~~786~~ /-1 R-1		72

COMPUTER LOG

S&W COMPUTER AUTH. NO. 0170

PROGRAM NAME / LIBRARY REF. NO.	VERSION /LEVEL	RUN NO.	JOB NO.	FICHE LOC / SECT	PREPARED BY / DATE	COMMENTS
NUPIPE / ME-110	V06/L03	001	3762	Att. 5 / A	F.CAPUANO / 02/23/93	RJE STORAGE: FCC.PM786:072
NUPIPE / ME-110	V06/L03	002	3823	Att. 5 / B	F.CAPUANO / 02/23/93	RJE STORAGE: FCC.PM786.WO41:072
NUPIPE / ME-110	V06/L03	008	7541	Att. 5 / C	F.CAPUANO / 03/24/93	RJE STORAGE: FCC.PM786.TB165:072
NUPIPE / ME-110	V06/L03	023	6343	Att. 5 / D	F.CAPUANO / 03/30/93	RJE STORAGE: FCC.PM786.WO9B7:072

INPUT DATA ECHO

```
 STMT   ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
NUMBER          0         0         0         0         0         0         0         0
   1    PECO PBAPS UNIT#2  03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV
   2    CONTROL             5    2.                   1.             .001
   3    CONTROL                  1.                                                 1.
   4    FLEXAN         1    1    3.
   5    DEADWEIGHT
   6    FLEXAN         2    1    2.
   7    THERMAL ANALYSIS (NORMAL)  551 DEG F
   8    FLEXAN         3    2    2.
   9    THERMAL ANALYSIS (MAXIMUM) 583 DEG F
  10    FLEXAN         4    1        18.      300.      200.        3.
  11    FT = FLUID TRANSIENT DUE TO TURBINE TRIP
  12    FFLEXAN        5    1         5.       20.       20.        1.
  13    FFLEXAN       -1
  14    X DIRECTION OBE EARTHQUAKE
  15    FFLEXAN        6    1         6.       20.       20.        2.
  16    FFLEXAN       -1
  17    Y DIRECTION OBE EARTHQUAKE
  18    FFLEXAN        7    1         7.       20.       20.        1.
  19    FFLEXAN       -1
  20    Z DIRECTION OBE EARTHQUAKE
  21    MODFLEX        8  5 6       1.        1.        1.
  22    ABS(X+Y) OBE EARTHQUAKE
  23    MODFLEX        9  6 7       1.        1.        1.
  24    ABS(Y+Z) OBE EARTHQUAKE
  25    MODFLEX       10  8 9       1.        1.        4.
  26    OBEI     MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
  27    MODFLEX       11 10         2.4
  28    SSEI     MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
  29    MODFLEX       12  410       1.        1.        4.
  30    UPSET    MAX OF (OBEI OR FT)
  31    MOD           13  1 2       1.        1.
  32    ALG.SUM (DWT,TH NORM)
  33    MOD           14  1 3       1.        1.
  34    ALG.SUM (DWT,TH MAX)
  35    MOD           15  113       1.        1.        3.
  36    LC#1      MAX. VALUE (DWT,(DWT+TH NORM))
  37    MOD           16  114       1.        1.        3.
  38    MAX. VALUE (DWT,(DWT+TH MAX))
  39    MOD           17 1213       1.        1.        1.
  40    LC#2      ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
  41    MOD           18 1116       1.        1.        1.
  42    LC#3      ABS.SUM(DWT OR (DWT+TH MAX),SSEI)
  43    TITLE               1
  44    AMPLIFIED RESPONSE SPECTRA (ARS) - RB EL.135'-165',TB EL.150'- 165'.5% DAMPING
  45    SPEC           1    1   0.010       .12      .033       .12      .037       .15
  46    SPEC           1    1    .045       .20      .077       .33      .100       .60
  47    SPEC           1    1    .111      1.92      .125      1.92      .133      2.27
  48    SPEC           1    1    .164      2.27      .167      2.09      .196       .64
  49    SPEC           1    1    .244       .36      .435       .29      .833       .29
  50    SPEC           1    1   1.220       .13    10.000       .00
        ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
                0         0         0         0         0         0         0         0
```

ATTACHMENT NO. 1

Calc. ... R. 1
App. 1
P 1 of 12

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

STMT NUMBER											
		0		0	0	0	0	0	0		0
51	SPEC		1	3	0.010	.10	.033	.10	.037		.15
52	SPEC		1	3	.045	.23	.071	.36	.091		.84
53	SPEC		1	3	.095	1.89	.111	1.89	.118		.93
54	SPEC		1	3	.122	1.09	.133	2.27	.164		2.27
55	SPEC		1	3	.167	2.09	.196	.64	.238		.39
56	SPEC		1	3	.500	.39	.769	.36	1.250		.12
57	SPEC		1	3	10.00	.00					
58	TITLE			2							
59	AMPLIFIED RESPONSE SPECTRA (ARS) - (2/3) GROUND SPECTRA .5% DAMPING										
60	SPEC		2	2	.000	.043	.025	.043	.033		.06
61	SPEC		2	2	.050	.087	.100	.113	.111		.122
62	SPEC		2	2	.125	.133	.143	.153	.167		.167
63	SPEC		2	2	.182	.173	.222	.173	.250		.167
64	SPEC		2	2	.333	.153	.500	.113	1.000		.057
65	SPEC		2	2	10.000	.057					
66	XSE26STM			1	26.00	1.086	317.0	29.9	1115.	1.	
67	XSE6"WTR			2	6.625	.432	50.5	27.9	1115.	2.	
68	XSEAOVDUM			3	26.00	1.086	.001	29.9	0.	3.	
69	XSE14STM			4	14.00	.750	123.0	27.9	1115.	3.	
70	XSE28STM			5	28.00	1.375	.001	29.9	1115.	3.	
71	OPV551		1	1	27.04	.04120					
72	OPV551		1	2	26.04	.04120					
73	OPV583		2	1	26.82	.04433					
74	OPV583		2	2	25.82	.04433					
75	ANCHOR			5	-11.00	138.15	45.00				
76	MARKNO	FLUED HEAD PEN N-7D									
77	RUN		5	10			2.583	1.	1.	1.9	
78	VALVE		10	15			3.583				
79	VALVE		15	20			1.250				
80	ELBOW		20	35							
81	DUMMY					.1521	.9884				
82	ELBOW		35	40			3.02				
83	DUMMY					.9884	.1521				
84	ELBOW		40	45							
85	RUN		45	54		.521					
86	RUN		54	56		4.161					
87	RUN		56	60		2.926					
88	RUN		60	65		5.074					
89	ELBOW		65	70							
90	RUN		70	75			5.833				
91	RESTRAINT			75		1500					
92	MARKNO	1DB-H1									
93	RUN		75	76			3.292				
94	RUN		76	80			5.403				
95	RUN		80	82			3.847				
96	RUN		82	90			5.542				
97	RUN		90	95			6.028				
98	RUN		95	100			6.028				
99	RESTRAINT			100		2160					
100	MARKNO	1DB-H2									
		0		0	0	0	0	0	0		0

See Att 2. For unit 3 spring settings

Calc. 1-1 R-1
Att-1
P2

ATTACHMENT NO. 1

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

STMT NUMBER										
	----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8									
		0	0	0	0	0	0	0	0	
101	RUN	100	105			1.943				
102	SNUBBER		105	1.0E8						
103	MARKNO	1DB-S2A								
104	RUN	105	110			5.833				
105	ELBOW	110	115							
106	RUN	115	125	-6.646						
107	RESTRAINT		125		1.0E8					
108	MARKNO	1DB-H3								
109	RUN	125	130	-4.451						
110	RUN	130	135	-4.451						
111	RUN	135	140	-4.451						
112	RESTRAINT		140		1.0E8					
113	MARKNO	1DB-H4								
114	RUN	140	145	-6.295						
115	RUN	145	150	-6.295						
116	RUN	150	155	-6.295						
117	RUN	155	160	-6.295						
118	RUN	160	165	-6.295						
119	RUN	165	170	-6.295						
120	RESTRAINT		170		1.0E8					
121	MARKNO	1DB-H5								
122	RUN	170	175	-4.771						
123	RUN	175	180	-4.771						
124	RUN	180	185	-4.771						
125	RUN	185	190	-4.771						
126	RUN	190	195	-4.771						
127	RUN	195	200	-4.771						
128	RUN	200	205	-4.771						
129	RUN	205	210	-4.771						
130	RESTRAINT		210		1.0E8					
131	MARKNO	1DB-H6								
132	RUN	210	215	-6.333						
133	RUN	215	220	-6.333						
134	RUN	220	225	-6.333						
135	RUN	225	230	-6.333						
136	RUN	230	235	-6.333						
137	RUN	235	240	-6.333						
138	RESTRAINT		240		1.0E8					
139	MARKNO	1DB-H7								
140	RUN	240	245	-3.104						
141	RUN	245	250	-3.104						
142	SNUBBER		250			1.0E8				
143	MARKNO	1DB-S7A								
144	RUN	250	255	-4.594						
145	RUN	255	260	-4.594						
146	ELBOW	260	265							
147	RUN	265	270			5.792				
148	RUN	270	275			5.792				
149	RESTRAINT		275		1.0E8					
150	MARKNO	1DB-H9B								
	----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8									
		0	0	0	0	0	0	0	0	

ATTACHMENT NO. 1 p3

Calc. 1-1 R-1
App. 1

PECO PBAPS UNIT#2 03040-NP(C)-~~PM-786~~ (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

STMT NUMBER									
		0	0	0	0	0	0	0	0
151	RUN	275	280			5.108			
152	RUN	280	285			5.108			
153	RUN	285	290			5.108			
154	RUN	290	295			5.108			
155	RUN	295	300			5.108			
156	RUN	300	305			5.108			
157	RESTRAINT		305		3000				
158	MARKNO	1DB-H10							
159	RUN	305	310			6.047			
160	RUN	310	315			6.047			
161	RUN	315	320			6.047			
162	RUN	320	325			6.047			
163	RESTRAINT		325		2160				
164	MARKNO	1DB-H11							
165	RUN	325	330			4.325			
166	RUN	330	335			4.325			
167	RUN	335	340			4.325			
168	RESTRAINT		340		3000				
169	MARKNO	1DB-H12							
170	RUN	340	345			4.443			
171	ELBOW	345	350						
172	RUN	350	355	4.875					
173	RUN	355	360	5.049					
174	RUN	360	365	5.049				1.3	
175	RUN	365	370	5.049				1.3	
176	RESTRAINT		370		2400				
177	MARKNO	1DB-H13							
178	RUN	370	375	3.302					
179	RUN	375	380	3.302				1.3	
180	RUN	380	385	1.000					
181	RUN	385	390	1.000				1.9	
182	RESTRAINT		390		1.0E8		1.0E10		
183	SNUBBER		390	1.0E8		1.0E8		1.0E10	1.0E10
184	MARKNO	MSV-4 (INLET)							
185	VALVE	15	25		-2.758	-2.758	3.		
186	MVALVE	25	30		-3.960	-3.960			
187	RUN	35	36		-2.29		2.	2.	3.02
188	RUN	40	41		-2.75		1.	1.	
189	RESTRAINT		41		1.0E8				
190	MARKNO	RESTRAINT #5							
191	RUN	355	356		2.583		4.	2.	
192	TEE	355	356	1.7					
193	RUN	385	386		-2.29		2.	2.	
194	TEE	385	386	1.41					
195	VALVE	390	400	11.083	-12.646		5.	1.	
196	RUN	400	405		-11.927				
197	RUN	405	410		-11.927				
198	ELBOW	410	415	11.000					
199	RUN	415	425	17.958					
200	RUN	425	435	17.958					
		0	0	0	0	0	0	0	0

ATTACHMENT NO. 1 p 4

Calc. 1-1 R.1
App. 1

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

STMT NUMBER													
		0	0	0	0	0	0	0	0	0	0	0	0
201	ELBOW	435	440	11.000									
202	RUN	440	450		12.950								
203	RUN	450	455		12.950								
204	RUN	455	460		12.950								
205	RUN	460	470		12.950								
206	ELBOW	470	475										
207	RUN	475	480			-4.08							
208	ANCHOR		480										
209	LMASS	10	54	56	76	82	105	125	140	170	210	240	250
210	LMASS	275	305	325	340	370							
211	LMASS	15	25	30	35	36	40	60	65	75	80		
212	LMASS	90	95	100	110	130	135	145	150	155	160	165	
213	LMASS	175	180	185	190	195	200	205	215	220	225	230	235
214	LMASS	245	255	260	270	280	285	290	295	300	310	315	
215	LMASS	320	330	335	345	355	356	360	365	375	380	385	386
216	CWEVLVBODY		25				8060.						
217	CWEVLVOPER		30				2015.						
218	CWEHGR R5		40				580.						
219	CWEREST 4		54				1080.						
220	CWEREST 3		56				1080.						
221	CWEREST 2		76				1080.						
222	CWEREST 1		82				170.						
223	CWEHGR H1		75				109.						
224	CWEHGR H2		100				109.						
225	CWEHGR H11		325				109.						
226	CWEHGR H12		340				109.						
227	CWEHGR S2A		105				620.						
228	CWEHGR H3		125				330.						
229	CWEHGR H4		140				300.						
230	CWEHGR H5		170				300.						
231	CWEHGR H6		210				300.						
232	CWEHGR H7		240				300.						
233	CWEHGR H9B		275				300.						
234	CWEHGR S7A		250				1450.						
235	CWEHGR H10		305				162.						
236	CWEHGR H13		370				220.						
237	CWE14"PIPE		356				1970.						
238	CWE4"PIPE		380				170.						
239	FORCE	1	75				8887.						
240	FORCE	1	100				6125.						
241	FORCE	1	305				8697.						
242	FORCE	1	325				6434.						
243	FORCE	1	340				8571.						
244	FORCE	1	370				7200.						
245	TFORCE	7	10							-.25			
246	TFORCE	8	15							-1.00			
247	TFORCE	9	65					-1.00					
248	TFORCE	10	110							-1.00			
249	TFORCE	11	260				1.00						
250	TFORCE	12	345							-1.00			
		0	0	0	0	0	0	0	0	0	0	0	0

Calc. 1-1 R. 1
APP. 1
ATTACHMENT NO. 1 P5

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

```
 STMT    ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
NUMBER          0         0         0         0         0         0         0         0
  251   TFORCE       13  360                 -1.00
  252   9CN           1        12
  253   9CF           1        11
  254   10CASES       2    3
  255   SUMMARY       1    2    3    4   10   11
  256   SUPPORT       1   10        11    2    3    4   15   17   18
  257   STITLE
  258   STITLE    MS "D" (CONTMT TO TSV)
  259   STITLE    03040-NP(C)-PM-786
  260   ALLDONE
  261    STORED AS:  FCC.PM786:072
  262   ALLDONE
```

ATTACHMENT NO. 1 p6

Calc. 1-1 R-1
App. 1

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

```
 STMT   ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
NUMBER          0         0         0         0         0         0         0         0
    1   PECO PBAPS UNIT#2  03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV
    2   CONTROL             5    2.                   1.          .001
    3   CONTROL                  1.                                        1.
    4   FLEXAN         1    1    3.
    5   DEADWEIGHT
    6   FLEXAN         2    1    2.
    7   THERMAL ANALYSIS (NORMAL)  551 DEG F
    8   FLEXAN         3    2    2.
    9   THERMAL ANALYSIS (MAXIMUM) 583 DEG F
   10   FLEXAN         4    1       18.      300.       200.        3.
   11   FT = FLUID TRANSIENT DUE TO TURBINE TRIP
   12   FFLEXAN        5    1       5.       20.        20.        1.
   13   FFLEXAN       -1
   14   X DIRECTION OBE EARTHQUAKE
   15   FFLEXAN        6    1       6.       20.        20.        2.
   16   FFLEXAN       -1
   17   Y DIRECTION OBE EARTHQUAKE
   18   FFLEXAN        7    1       7.       20.        20.        1.
   19   FFLEXAN       -1
   20   Z DIRECTION OBE EARTHQUAKE
   21   MODFLEX        8  5 6       1.        1.         1.
   22   ABS(X+Y) OBE EARTHQUAKE
   23   MODFLEX        9  6 7       1.        1.         1.
   24   ABS(Y+Z) OBE EARTHQUAKE
   25   MODFLEX       10  8 9       1.        1.         4.
   26   OBEI     MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
   27   MODFLEX       11 10        2.4
   28   SSEI     MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
   29   MODFLEX       12  410       1.        1.         4.
   30   UPSET    MAX OF (OBEI OR FT)
   31   MOD           13  1 2       1.        1.
   32   ALG.SUM (DWT,TH NORM)
   33   MOD           14  1 3       1.        1.
   34   ALG.SUM (DWT,TH MAX)
   35   MOD           15  113       1.        1.         3.
   36   LC#1      MAX. VALUE (DWT,(DWT+TH NORM))
   37   MOD           16  114       1.        1.         3.
   38   MAX. VALUE (DWT,(DWT+TH MAX))
   39   MOD           17 1213       1.        1.         1.
   40   LC#2      ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
   41   MOD           18 1116       1.        1.         1.
   42   LC#3      ABS.SUM(DWT OR (DWT+TH MAX),SSEI)
   43   TITLE              1
   44   AMPLIFIED RESPONSE SPECTRA (ARS) - RB EL.135'-165',TB EL.150'- 165',5% DAMPING
   45   SPEC          1    1     0.010      .12       .033       .12       .037      .15
   46   SPEC          1    1      .045      .20       .077       .33       .100      .60
   47   SPEC          1    1      .111     1.92       .125      1.92       .133     2.27
   48   SPEC          1    1      .164     2.27       .167      2.09       .196      .64
   49   SPEC          1    1      .244      .36       .435       .29       .833      .29
   50   SPEC          1    1     1.220      .13     10.000       .00
        ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
                 0         0         0         0         0         0         0         0
```

ATTACHMENT NO. 1 P7

Calc. 1-1 R. 1
APP. 1

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

STMT NUMBER										
		0	0	0	0	0	0	0	0	
51	SPEC	1	3	0.010	.10	.033	.10	.037	.15	
52	SPEC	1	3	.045	.23	.071	.36	.091	.84	
53	SPEC	1	3	.095	1.89	.111	1.89	.118	.93	
54	SPEC	1	3	.122	1.09	.133	2.27	.164	2.27	
55	SPEC	1	3	.167	2.09	.196	.64	.238	.39	
56	SPEC	1	3	.500	.39	.769	.36	1.250	.12	
57	SPEC	1	3	10.00	.00					
58	TITLE		2							
59	AMPLIFIED RESPONSE SPECTRA (ARS) - (2/3) GROUND SPECTRA .5% DAMPING									
60	SPEC	2	2	.000	.043	.025	.043	.033	.06	
61	SPEC	2	2	.050	.087	.100	.113	.111	.122	
62	SPEC	2	2	.125	.133	.143	.153	.167	.167	
63	SPEC	2	2	.182	.173	.222	.173	.250	.167	
64	SPEC	2	2	.333	.153	.500	.113	1.000	.057	
65	SPEC	2	2	10.000	.057					
66	XSE26STM		1	26.00	1.086	317.0	29.9	1115.	1.	
67	XSE6"WTR		2	6.625	.432	50.5	27.9	1115.	2.	
68	XSEAOVDUM		3	26.00	1.086	.001	29.9	0.	3.	
69	XSE14STM		4	14.00	.750	123.0	27.9	1115.	3.	
70	XSE28STM		5	28.00	1.375	.001	29.9	1115.	3.	
71	OPV551	1	1	27.04	.04120					
72	OPV551	1	2	26.04	.04120					
73	OPV583	2	1	26.82	.04433					
74	OPV583	2	2	25.82	.04433					
75	ANCHOR		5	-11.00	138.15	45.00				
76	MARKNO	FLUED HEAD PEN N-7D								
77	RUN	5	10			2.583	1.	1.	1.9	
78	VALVE	10	15			3.583				
79	VALVE	15	20			1.250				
80	ELBOW	20	35							
81	DUMMY				.1521	.9884				
82	ELBOW	35	40			3.02				
83	DUMMY				.9884	.1521				
84	ELBOW	40	45							
85	RUN	45	54		.521					
86	RUN	54	56		4.161					
87	RUN	56	60		2.926					
88	RUN	60	65		5.074					
89	ELBOW	65	70							
90	RUN	70	75			5.833				
91	RESTRAINT		75		1500					
92	MARKNO	1DB-H1								
93	RUN	75	76			3.292				
94	RUN	76	80			5.403				
95	RUN	80	82			3.847				
96	RUN	82	90			5.542				
97	RUN	90	95			6.028				
98	RUN	95	100			6.028				
99	RESTRAINT		100		2160					
100	MARKNO	1DB-H2								
		0	0	0	0	0	0	0	0	

Calc. 1-1 R.1
App. 1
ATTACHMENT NO. 1 P8

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

STMT NUMBER							
	0	0	0	0	0	0	0
101	RUN	100	105		1.943		
102	SNUBBER		105	1.0E8			
103	MARKNO	1DB-S2A					
104	RUN	105	110		5.833		
105	ELBOW	110	115				
106	RUN	115	125	-6.646			
107	RESTRAINT		125		1.0E8		
108	MARKNO	1DB-H3					
109	RUN	125	130	-4.451			
110	RUN	130	135	-4.451			
111	RUN	135	140	-4.451			
112	RESTRAINT		140		1.0E8		
113	MARKNO	1DB-H4					
114	RUN	140	145	-6.295			
115	RUN	145	150	-6.295			
116	RUN	150	155	-6.295			
117	RUN	155	160	-6.295			
118	RUN	160	165	-6.295			
119	RUN	165	170	-6.295			
120	RESTRAINT		170		1.0E8		
121	MARKNO	1DB-H5					
122	RUN	170	175	-4.771			
123	RUN	175	180	-4.771			
124	RUN	180	185	-4.771			
125	RUN	185	190	-4.771			
126	RUN	190	195	-4.771			
127	RUN	195	200	-4.771			
128	RUN	200	205	-4.771			
129	RUN	205	210	-4.771			
130	RESTRAINT		210		1.0E8		
131	MARKNO	1DB-H6					
132	RUN	210	215	-6.333			
133	RUN	215	220	-6.333			
134	RUN	220	225	-6.333			
135	RUN	225	230	-6.333			
136	RUN	230	235	-6.333			
137	RUN	235	240	-6.333			
138	RESTRAINT		240		1.0E8		
139	MARKNO	1DB-H7					
140	RUN	240	245	-3.104			
141	RUN	245	250	-3.104			
142	SNUBBER		250		1.0E8		
143	MARKNO	1DB-S7A					
144	RUN	250	255	-4.594			
145	RUN	255	260	-4.594			
146	ELBOW	260	265				
147	RUN	265	270		5.792		
148	RUN	270	275		5.792		
149	RESTRAINT		275		1.0E8		
150	MARKNO	1DB-H9B					
	0	0	0	0	0	0	0

ATTACHMENT NO. 1 pg

Calc. 1-1 R. 1
App. 1

INPUT DATA ECHO

STMT NUMBER										
		0	0	0	0	0	0	0	0	
151	RUN	275	280			5.108				
152	RUN	280	285			5.108				
153	RUN	285	290			5.108				
154	RUN	290	295			5.108				
155	RUN	295	300			5.108				
156	RUN	300	305			5.108				
157	RESTRAINT		305		3000					
158	MARKNO	1DB-H10								
159	RUN	305	310			6.047				
160	RUN	310	315			6.047				
161	RUN	315	320			6.047				
162	RUN	320	325			6.047				
163	RESTRAINT		325		2160					
164	MARKNO	1DB-H11								
165	RUN	325	330			4.325				
166	RUN	330	335			4.325				
167	RUN	335	340			4.325				
168	RESTRAINT		340		3000					
169	MARKNO	1DB-H12								
170	RUN	340	345			4.443				
171	ELBOW	345	350							
172	RUN	350	355	4.875						
173	RUN	355	360	5.049						
174	RUN	360	365	5.049					1.3	
175	RUN	365	370	5.049					1.3	
176	RESTRAINT		370		2400					
177	MARKNO	1DB-H13								
178	RUN	370	375	3.302						
179	RUN	375	380	3.302					1.3	
180	RUN	380	385	1.000						
181	RUN	385	390	1.000					1.9	
182	RESTRAINT		390		1.0E8		1.0E10			
183	SNUBBER		390	1.0E8		1.0E8		1.0E10		1.0E10
184	MARKNO	MSV-4 (INLET)								
185	VALVE	15	25		-2.758	-2.758	3.			
186	MVALVE	25	30		-3.960	-3.960				
187	RUN	35	36		-2.29		2.	2.		3.02
188	RUN	355	356		2.583		4.	2.		
189	TEE	355	356	1.7						
190	RUN	385	386		-2.29		2.	2.		
191	TEE	385	386	1.41						
192	VALVE	390	400	11.083	-12.646		5.	1.		
193	RUN	400	405		-11.927					
194	RUN	405	410		-11.927					
195	ELBOW	410	415	11.000						
196	RUN	415	425	17.958						
197	RUN	425	435	17.958						
198	ELBOW	435	440	11.000						
199	RUN	440	450		12.950					
200	RUN	450	455		12.950					
		0	0	0	0	0	0	0	0	

ATTACHMENT NO. 1 P 10

Calc. 1-1 R. 1
App. 1

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

STMT NUMBER													
	----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8												
		0	0	0	0	0	0	0	0	0	0	0	0
201	RUN	455	460			12.950							
202	RUN	460	470			12.950							
203	ELBOW	470	475										
204	RUN	475	480					-4.08					
205	ANCHOR		480										
206	LMASS	10	54	56	76	82	105	125	140	170	210	240	250
207	LMASS	275	305	325	340	370							
208	LMASS	15	25	30	35	36	40	60	65	75	80		
209	LMASS	90	95	100	110	130	135	145	150	155	160	165	
210	LMASS	175	180	185	190	195	200	205	215	220	225	230	235
211	LMASS	245	255	260	270	280	285	290	295	300	310	315	
212	LMASS	320	330	335	345	355	356	360	365	375	380	385	386
213	CWEVLVBODY		25				8060.						
214	CWEVLVOPER		30				2015.						
215	CWEHGR R5		40				580.						
216	CWEREST 4		54				1080.						
217	CWEREST 3		56				1080.						
218	CWEREST 2		76				1080.						
219	CWEREST 1		82				170.						
220	CWEHGR H1		75				109.						
221	CWEHGR H2		100				109.						
222	CWEHGR H11		325				109.						
223	CWEHGR H12		340				109.						
224	CWEHGR S2A		105				620.						
225	CWEHGR H3		125				330.						
226	CWEHGR H4		140				300.						
227	CWEHGR H5		170				300.						
228	CWEHGR H6		210				300.						
229	CWEHGR H7		240				300.						
230	CWEHGR H9B		275				300.						
231	CWEHGR S7A		250				1450.						
232	CWEHGR H10		305				162.						
233	CWEHGR H13		370				220.						
234	CWE14"PIPE		356				1970.						
235	CWE4"PIPE		380				170.						
236	FORCE	1	75				8887.						
237	FORCE	1	100				6125.						
238	FORCE	1	305				8697.						
239	FORCE	1	325				6434.						
240	FORCE	1	340				8571.						
241	FORCE	1	370				7200.						
242	TFORCE	7	10								-.25		
243	TFORCE	8	15								-1.00		
244	TFORCE	9	65						-1.00				
245	TFORCE	10	110								-1.00		
246	TFORCE	11	260				1.00						
247	TFORCE	12	345								-1.00		
248	TFORCE	13	360				-1.00						
249	9CN	1		12									
250	9CF	1		11									
	----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8												
		0	0	0	0	0	0	0	0	0	0	0	0

ATTACHMENT NO. 1 P 11

Calc. 1-1 R. 1
APP. 1

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" CONTMT TO TSV

INPUT DATA ECHO

```
 STMT    ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
NUMBER          0         0         0         0         0         0         0         0
   251   10CASES       2    3
   252   SUMMARY       1    2    3    4   10   11
   253   SUPPORT       1   10        11    2    3    4   15   17   18
   254   STITLE
   255   STITLE    MS "D" (CONTMT TO TSV)
   256   STITLE    03040-NP(C)-PM-786
   257   ALLDONE
   258    STORED AS:  FCC.PM786.W041:072
   259   ALLDONE
```

ATTACHMENT NO. 1 p12

Calc. 1-1 R. 1
App. 1

Calc. 1-1 R.1 App. 1

03040-~~NE(C)~~-PM786, ATTACHMENT 2 p1 of 3

Grinnell CORPORATION

1341 Elmwood Avenue
Cranston, RI 02910 USA
Tel: 401-941-8000
Fax: 401-781-7150

Fax: 401-781-7150

FAX TRANSMISSION

DATE: 3/23/93

TO:
NAME: Y.C. JEN
FIRM: STONE & WEBSTER ENGR. CORP.
FAX NO: 609-482-3283

FROM:
NAME: JEAN P. GOULET

NUMBER OF PAGES TO FOLLOW (EXCLUDING COVER PAGE): 8

SUBJECT: Design Report Summary for FCP 200N & FCP 201N is enclosed for your information.

calc. 1-1 R-1 App-1

03040-NP(L)-Pm786, ATTACHMENT 2 p2

GRINNELL CORPORATION

DESIGN REPORT SUMMARY FOR FIG. 200N & FIG. 201N HYDRAULIC SNUBBERS

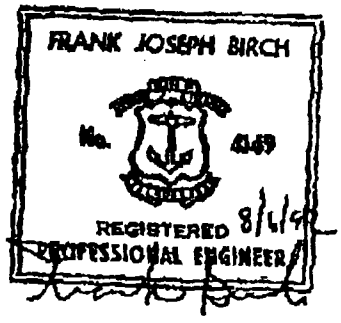
1. GENERAL INFORMATION

CODE CLASS:	1, 2, 3, MC	SERVICE LIMITS:	Levels A,B,C,D
MATERIAL DATA:	See Page 2 & 3	DESIGN TEMPERATURE:	200°F*
LOAD RATINGS:	See Page 4		650°F(Clamps)
DESIGN BY:	Analysis	DIMENSIONAL DATA:	See Page 5-8

2. CERTIFICATION

I CERTIFY THAT THE LOAD CAPACITY OF THIS COMPONENT STANDARD SUPPORT IS RATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE A.S.M.E. B&PV CODE, SECTION III, SUBSECTIONS NCA & NF AND GRINNELL'S DESIGN SPECIFICATION PE188-1 Rev.7.

THE SUBSTANTIATING DESIGN REPORT DR200, DESIGN REPORT CERTIFICATION, AND GRINNELL'S DESIGN SPECIFICATION ARE LOCATED AT THE PIPE SUPPORT DIVISION - CRANSTON, RI.



3. REVISIONS

DRS Rev.	Report Rev.	Code** Edition	Code** Addenda	P.E.	Date
0	5	1989	1991	FJB	8/6/92

* 340°F for 3 hours maximum

** When sizes 3 1/4 thru 8 are used to support components other than piping (such as valves & pumps) the applicable Code Year is up to and including 1980, S-82.

(2188S)

Calc. 1-1 R-1 App. 1

03040-NP(c)-AM786, ATTACHMENT 2 p3

GRINNELL CORPORATION

DESIGN REPORT SUMMARY
FOR
FIG. 200N/201N HYDRAULIC SNUBBERS

LOAD RATINGS (LBS)

Bore Size	Design & Levels A&B	Level C	Level D
1 1/2*	3000/1250	3600/1650	4000/1950
2 1/2	10350	13750	19100
3 1/4	17600	23450	30800
4	27300	37300	45000
5	45500	62000	75000
6	68200	92900	112600
8	110000	132000	165000

* Lesser load rating is for 10" stroke.

Calc. 1-1 R.1 APP.1

03040-NP(L)-PM-786 ATTACHMENT 3 P1OF1

J.O. 8364824.11

PECO PBAPS 2&3
POWER RERATE PROJECT

SWEC OPEN ITEMS NOTIFICATION/RESOLUTION REPORT JAN 04 1993

OPEN ITEM NO: OI-PR-024

SWEC INITIATOR: X. G. Jan

PHONE: (609)482-9121

INITIATION DATE: 12/24/92

c.c TRMadden
Job book 245/R2.4.1
LJCorsi
CSLai

RESPONSE REQUIRED BY 01/15/93

SUBJECT: Restraint Supports of Main Steam Piping for power rerate review

POTENTIAL CONCERNS/QUESTIONS

There is no official document to address the qualification of these supports, the only reference document is based on the 'BECHTEL' Main Steam 6280 Binder # 19 for initial review. Due to the 1.76 % thermal load increase and approximately 17% fluid transient load increase in the Main Steam Piping, an average screening criteria 16 % for MSS pipe support is calculated. No calculation for the support structure qualification is included in the referenced document. The following supports exceed allowables in the component part of sway strut for upset condition (see pg.2 for component part evaluation) at the rerate condition:

1DB-H4, H5, H6, H26, H17, H27, H28, H29, H30, H41 & H42.

It is recommended that these loads be re-reviewed based on the main steam piping reanalysis being performed using the new detailed fluid transient loads. Component acceptability will be based on the revised loads. Until then, these items will be "open" relative to acceptability for rerate.

Please provide PECO's concurrence with this approach, or alternate direction by 1/15/93.

PECo RESPONSE/CLOSEOUT:

The SWEC recommendation seems appropriate. Please prepare a task scoping change notice and description of your proposed action

RESPONSE BY: D. T. Clohecy

PHONE: (215)640-6574

RESPONSE DATE: 1-19-93

CALCULATION IDENTIFICATION NUMBER				
JOB NUMBER	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
03040	NP(C)	~~PM-786~~ 1-1 R-1	N/A	1 of 15

SUPPORT LOAD COMPARISON (PM-786 vs. PREVIOUS ANALYSES)

In order to facilitate a) the evaluation of the support loads generated in this calculation and b) the resolution of Power Rerate Open Item PB-OI-024, the support load comparisons and computer analysis addressed below are provided in this attachment.

Description	page
Tabulation and comparison of rigid hanger loads and snubber loads for Unit 2 main steam line D. The loads from this calculation (Jobs 3762, 3823) are compared to the loads from previous analyses (ref. 20, 22, 23).	2
Tabulation and comparison of rigid hanger loads for Unit 2 main steam line A, B, C in support of the resolution of PB-OI-024. The loads from this calculation (Jobs 3762, 3823) are used for the Line C supports and the loads from Job 6343 are used for the Line A and B supports. See notes 5 and 12d for detailed explanation of the differences between lines A/B and C/D and Job 6343. These loads are compared to the loads from previous analyses (ref. 20, 22, 23).	3
Support load summary from Job 6343	4-7
System restraints from Job 6343	8
Cold loads at "spring hangers" from Job 6343	9
Input data echo from Job 6343	10-15

Load combinations used for support comparisons on pages 2 and 3

UPSET = Max of (DWT or DWT+THERMAL) + Max of (OBE or FT)

FAULTED = Max of (DWT or DWT+THERMAL) + SSE

Note that this approach conservatively excludes the thermal load if it will decrease the total loading.

Calc. 1-1 R.1 APP. 1

LOAD COMPARISON (MAIN STEAM LINE D) RIGID HANGER AND SNUBBER LOADS

LOADS FROM ~~PM-786~~ 1-1

LOAD (lb)	HANGER (NODE)								
	R5 (41)	H3 (125)	H4 (140)	H5 (170)	H6 (210)	H7 (240)	H9B (275)	S2A (105)	S7A (250)
DWT	-10837	-4924	-9053	-12810	-12306	-12492	-8687	0	0
THERMAL (583F)	-4724	549	70	17	-68	-22	138	0	0
FT+	0	10842	6474	737	829	1122	1110	39393	83420
FT-	-40395	-15083	-6224	-695	-961	-1141	-1036	-61204	-72204
OBE	-15807	11665	4542	1531	1873	2988	3972	47626	90318
SSE	-37938	27997	10900	3674	4494	7172	9532	112600	216764
UPSET+	0	7290	0	0	0	0	0	47626	90318
UPSET-	-55956	-20007	-15277	-14341	-14247	-15502	-12659	-61204	-90318
FAULTED+	0	23622	1917	0	0	0	983	112600	216764
FAULTED-	-53499	-32921	-19953	-16484	-16868	-19686	-18219	-112600	-216764

LOADS FROM PREVIOUS ANALYSES 1-1W,S,T, D-007, BINDER 19 (REF 20,22,23)

LOAD (lb)	REF.	HANGER (NODE)							
		H3 (125)	H4 (140)	H5 (170)	H6 (210)	H7 (240)	H9B (275)	S2A (105)	S7A (250)
DWT	1-1W	-4726	-9236	-12785	-12501	-10429	-8507	0	0
THERMAL (583F)	1-1W,T	784	-91	9	-17	431	1451	0	0
FT+	D007,BR19	13936	8329	1615	1310	2005	1261	82248	190000
FT-	D007,BR19	-21153	-4329	-1623	-1276	-2572	-994	-82248	-190000
OBE	1-1S,BR19	11209	4109	269	185	4697	17266	4364	20000
SSE	1-1S,BR19	26902	9862	646	444	11273	41438	10474	48000
UPSET+		9994	0	0	0	0	10210	82248	190000
UPSET-		-25879	-13656	-14408	-13794	-15126	-25773	-82248	-190000
FAULTED+		22960	626	0	0	1275	34382	10474	48000
FAULTED-		-31628	-19189	-13431	-12962	-21702	-49945	-10474	-48000

IDENTIFICATION OF LOAD RATIOS GREATER THAN 1.0 (~~PM-786~~ 1-1 LOADS / PREVIOUS LOADS)

		HANGER (NODE)							
		H3 (125)	H4 (140)	H5 (170)	H6 (210)	H7 (240)	H9B (275)	S2A (105)	S7A (250)
UPSET+									
UPSET-			1.12		1.03	1.02			
FAULTED+		1.03	3.06					10.75	4.52
FAULTED-		1.04	1.04	1.23	1.30			10.75	4.52

Calc. 1-1 R-1 App. 1

LOAD COMPARISON (MAIN STEAM LINES A, B, C) RIGID HANGER LOADS

LOADS FROM PREVIOUS ANALYSES 1-1W,S,T, D-007, BINDER 19 (REF 20,22,23)

	HANGER (LOOP)							
LOAD (lb)	H17	H26	H27	H28	H29	H30	H41	H42
	(C)	(C)	(B)	(B)	(B)	(B)	(A)	(A)
SIMILAR "D" HGR	H5	H3	H3	H4	H5	H6	H5	H6
DW	-12911	-5152	-7918	-10261	-13722	-14146	-13128	-13790
THERMAL (583F)	61	503	422	242	-368	473	-421	568
FT+	1600	14000	14000	8500	1600	1300	1600	2000
FT-	-1600	-22000	-22000	-4500	-1600	-1300	-1600	-1800
OBE	1807	3975	3450	2339	4706	6966	7889	12390
SSE	4337	9540	8280	5614	11294	16718	18934	29736
UPSET+	0	9351	6504	0	0	0	0	0
UPSET-	-14718	-27152	-29918	-14761	-18796	-21112	-21438	-26180
FAULTED+	0	4891	784	0	0	3045	5806	16514
FAULTED-	-17248	-14692	-16198	-15875	-25384	-30864	-32483	-43526

LOADS FROM ~~PM-786~~ 1-1 (SEE NOTES 5 AND 12D ADDRESSING DIFFERENCES BETWEEN LOOPS)

	HANGER (LOOP)							
LOAD (lb)	H17	H26	H27	H28	H29	H30	H41	H42
	(C)	(C)	(B)	(B)	(B)	(B)	(A)	(A)
SIMILAR "D" HGR	H5	H3	H3	H4	H5	H6	H5	H6
COMPUTER JOB	3762,3823	3762,3823	6343	6343	6343	6343	6343	6343
NODE	(170)	(125)	(125)	(140)	(170)	(210)	(170)	(210)
DW	refer to loads from previous analyses above							
THERMAL (583F)	refer to loads from previous analyses above							
FT+	737	10842	10326	7457	831	1790	831	1790
FT-	-695	-15083	-14902	-6026	-843	-2104	-843	-2104
OBE	1531	11665	11757	5299	3665	4876	3665	4876
SSE	3674	27997	28218	12718	8796	11702	8796	11702
UPSET+	0	7016	4261	0	0	0	0	0
UPSET-	-14442	-20235	-22820	-16287	-17755	-19022	-17214	-18666
FAULTED+	0	23348	20722	2699	0	0	0	0
FAULTED-	-16585	-33149	-36136	-22979	-22886	-25848	-22345	-25492

IDENTIFICATION OF LOAD RATIOS GREATER THAN 1.0 (~~PM-786~~ 1-1 LOADS / PREVIOUS LOADS)

	HANGER (LOOP)							
	H17	H26	H27	H28	H29	H30	H41	H42
	(C)	(C)	(B)	(B)	(B)	(B)	(A)	(A)
SIMILAR "D" HGR	H5	H3	H3	H4	H5	H6	H5	H6
UPSET+								
UPSET-				1.10				
FAULTED+		4.77	26.43	2699.00				
FAULTED-		2.26	2.23	1.45				

****
* POINT NO. 125 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H3 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)			
EQ.8	EQ.9	EQ.10	EQ.11
6991.	9861.	903.	7894.

GLOBAL COORDINATES (FT)		
X COORD	Y COORD	Z COORD
-17.65	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	317.	0.	-4924.	0.	0.	0.	0.	0.01	0.00	0.06	0.000	0.000	0.000
OBEI	10	2033.	0.	-11757.	0.	0.	0.	0.	0.15	0.00	0.53	0.001	0.004	0.000
OBEA	NOT SPECIFIED													
SSEI	11	4878.	0.	-28218.	0.	0.	0.	0.	0.35	0.00	1.26	0.003	0.009	0.000
NORM	2	839.	0.	333.	0.	0.	0.	0.	-0.37	0.00	2.23	0.001	-0.002	0.000
THERANC	3	903.	0.	358.	0.	0.	0.	0.	-0.40	0.00	2.40	0.001	-0.002	0.000
OCCMAX	4	2870.	0.	-14902.	0.	0.	0.	0.	-0.28	0.00	0.59	-0.001	-0.004	0.000
OCCMIN			0.	10326.	0.	0.	0.	0.	0.20	0.00	-0.47	0.001	0.003	0.000
MODFLEX	15	907.	0.	-4924.	0.	0.	0.	0.	-0.36	0.00	2.29	0.001	-0.002	0.000
MODFLEX	17	3768.	0.	-19493.	0.	0.	0.	0.	0.64	0.00	2.87	0.002	0.006	0.000
MODFLEX	18	5822.	0.	-33142.	0.	0.	0.	0.	0.74	0.00	3.72	0.004	0.011	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

ATTACHMENT NO. 4 p4

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" MODELED AS "A/B"

PIPE SUPPORT SUMMARY

****
* POINT NO. 140 *
* FUNCTION: RESTRAINT *
****

****
* SUPPORT MARK NO. *
* 1DB-H4 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7278.	10444.	661.	7939.

(FT) GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-31.00	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	605.	0.	-8931.	0.	0.	0.	0.	0.01	0.00	0.06	0.000	0.000	0.000
OBEI	10	2181.	0.	-5299.	0.	0.	0.	0.	0.15	0.00	1.13	0.001	0.004	0.000
OBEA		NOT SPECIFIED												
SSEI	11	5235.	0.	-12718.	0.	0.	0.	0.	0.36	0.00	2.71	0.003	0.010	0.000
NORM	2	614.	0.	112.	0.	0.	0.	0.	-0.92	0.00	1.96	0.001	-0.002	0.000
THERANC	3	661.	0.	121.	0.	0.	0.	0.	-0.99	0.00	2.11	0.001	-0.002	0.000
OCCMAX	4	3166.	0.	7457.	0.	0.	0.	0.	-0.28	0.00	0.60	-0.001	-0.004	0.000
OCCMIN			0.	-6026.	0.	0.	0.	0.	0.21	0.00	-0.48	0.001	0.003	0.000
MODFLEX	15	859.	0.	-8931.	0.	0.	0.	0.	-0.91	0.00	2.02	0.001	-0.002	0.000
MODFLEX	17	3864.	0.	-16276.	0.	0.	0.	0.	1.19	0.00	3.15	0.002	0.006	0.000
MODFLEX	18	5985.	0.	-21649.	0.	0.	0.	0.	1.34	0.00	4.87	0.003	0.012	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R. 1
App. 1

ATTACHMENT NO. 4 PS

STONE & WEBSTER ENGINEERING CORPORATION

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" MODELED AS "A/B"

****
* POINT NO. 170 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H5 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7624.	11967.	201.	7824.

(FT) GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-68.77	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	950.	0.	-12810.	0.	0.	0.	0.	0.01	0.00	0.05	0.000	0.000	0.000
OBEI	10	3776.	0.	-3665.	0.	0.	0.	0.	0.15	0.00	2.37	0.001	0.002	0.000
OBEA		NOT SPECIFIED												
SSEI	11	9061.	0.	-8796.	0.	0.	0.	0.	0.36	0.00	5.68	0.002	0.005	0.000
NORM	2	187.	0.	-105.	0.	0.	0.	0.	-2.48	0.00	1.04	0.001	-0.002	0.000
THERANC	3	201.	0.	-113.	0.	0.	0.	0.	-2.67	0.00	1.12	0.001	-0.002	0.000
OCCMAX	4	4344.	0.	-843.	0.	0.	0.	0.	-0.29	0.00	-1.19	-0.001	0.002	0.000
OCCMIN			0.	831.	0.	0.	0.	0.	0.21	0.00	0.94	0.001	-0.002	0.000
MODFLEX	15	976.	0.	-12915.	0.	0.	0.	0.	-2.47	0.00	1.09	0.001	-0.002	0.000
MODFLEX	17	4527.	0.	-16580.	0.	0.	0.	0.	2.75	0.00	3.46	0.002	0.004	0.000
MODFLEX	18	9322.	0.	-21719.	0.	0.	0.	0.	3.01	0.00	6.85	0.003	0.007	0.000

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

ATTACHMENT NO. 4 P6

Calc. 1-1 R.1 App. 1

****
* POINT NO. 210 *
* FUNCTION: RESTRAINT *
****

PIPE SUPPORT SUMMARY

****
* SUPPORT MARK NO. *
* 1DB-H6 *
****

GLOBAL

MINIMUM CLASS 2 STRESSES (PSI)

EQ.8	EQ.9	EQ.10	EQ.11
7546.	11887.	811.	8357.

(FT)
GLOBAL COORDINATES

X COORD	Y COORD	Z COORD
-106.94	153.83	99.17

LOAD TYPE	CASE	(PSI) MNS	FORCES (LBF) FX	FY	FZ	MOMENTS (FT-LBF) MX	MY	MZ	DEFLECTIONS (IN) DX	DY	DZ	ROTATIONS (RAD) RX	RY	RZ
DWT	1	873.	0.	-12284.	0.	0.	0.	0.	0.01	0.00	0.05	0.000	0.000	0.000
OBEI	10	3799.	0.	-4876.	0.	0.	0.	0.	0.15	0.00	1.95	0.001	0.003	0.001
OBEA	NOT SPECIFIED													
SSEI	11	9117.	0.	-11702.	0.	0.	0.	0.	0.36	0.00	4.68	0.002	0.007	0.001
NORM	2	754.	0.	91.	0.	0.	0.	0.	-4.05	0.00	0.15	0.001	-0.002	0.000
THERANC	3	811.	0.	97.	0.	0.	0.	0.	-4.36	0.00	0.16	0.001	-0.002	0.000
OCCMAX	4	4341.	0.	-2104.	0.	0.	0.	0.	-0.29	0.00	-1.06	-0.001	-0.002	0.000
OCCMIN			0.	1790.	0.	0.	0.	0.	0.21	0.00	1.02	0.001	0.002	0.000
MODFLEX	15	1153.	0.	-12284.	0.	0.	0.	0.	-4.04	0.00	0.20	0.000	-0.002	0.000
MODFLEX	17	5160.	0.	-17069.	0.	0.	0.	0.	4.33	0.00	2.15	0.001	0.005	0.001
MODFLEX	18	10231.	0.	-23986.	0.	0.	0.	0.	4.71	0.00	4.89	0.003	0.009	0.001

CASE	DESCRIPTION	TITLE
1	DEADWEIGHT	DEADWEIGHT
10	1/2 SSE INERTIA	OBEI MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
11	SSE INERTIA	SSEI MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
2	NORMAL OPERATING	THERMAL ANALYSIS (NORMAL) 551 DEG F
3	THERMAL EXPAN + ANC MVMTS	THERMAL ANALYSIS (MAXIMUM) 583 DEG F
4	TIME HISTORY DYNAMIC FORCE	FT = FLUID TRANSIENT DUE TO TURBINE TRIP
15	MODFLEX	LC#1 MAX. VALUE (DWT,(DWT+TH NORM))
17	MODFLEX	LC#2 ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
18	MODFLEX	LC#3 ABS.SUM(DWT OR (DWT+TH MAX),SSEI)

Calc. 1-1 R.1
App. 1
ATTACHMENT NO. 4 P7

PECO PBAPS UNIT#2 D3040-NP(C)~~-PM-786~~ (RERATE) MS "D" MODELED AS "A/B"

SYSTEM RESTRAINTS

ORTHOGONAL RESTRAINTS

NODE	GROUP	TYPE	TRANSLATIONAL (LBF/IN) X	Y	Z	ROTATIONAL (IN-LBF/RAD) X	Y	Z	MARK NO.
5	1	ANCHOR	1.E+08	1.E+08	1.E+08	1.E+10	1.E+10	1.E+10	FLUED HEAD PEN N-7D
75	1	RESTRAINT		1500.					1DB-H1
100	1	RESTRAINT		2160.					1DB-H2
105	1	SNUBBER	1.E+08						1DB-S2A
125	1	RESTRAINT		1.E+08					1DB-H3
140	1	RESTRAINT		1.E+08					1DB-H4
170	1	RESTRAINT		1.E+08					1DB-H5
210	1	RESTRAINT		1.E+08					1DB-H6
240*	1	RESTRAINT		1.					1DB-H7
250	1	SNUBBER			1.E+08				1DB-S7A
275*	1	RESTRAINT		1.					1DB-H9B
305	1	RESTRAINT		3000.					1DB-H10
325	1	RESTRAINT		2160.					1DB-H11
340	1	RESTRAINT		3000.					1DB-H12
370	1	RESTRAINT		2400.					1DB-H13
390	1	RESTRAINT		1.E+08		1.E+10			
390	1	SNUBBER	1.E+08		1.E+08		1.E+10	1.E+10	MSV-4 (INLET)
480	1	ANCHOR	1.E+08	1.E+08	1.E+08	1.E+10	1.E+10	1.E+10	

* H7 AND H9B MODELED AS "SPRINGS" TO SIMULATE LOOPS A AND B
SEE NOTES 5 AND 12D IN MAIN BODY OF CALC FOR DETAILS
STIFFNESS OF 1.0 IS CONSERVATIVELY USED

Calc. 1-1 R.1
App. 1
ATTACHMENT NO. 4 P8

NODAL LOADS

STATIC FORCES

NODE	THERMAL MODE	FORCES (LBF) X	Y	Z	MOMENTS (FT-LBF) X	Y	Z
75	1	0.	8887.	0.	0.	0.	0.
100	1	0.	6125.	0.	0.	0.	0.
305	1	0.	8697.	0.	0.	0.	0.
325	1	0.	6434.	0.	0.	0.	0.
340	1	0.	8571.	0.	0.	0.	0.
370	1	0.	7200.	0.	0.	0.	0.
275	1	0.	8657.*	0.	0.	0.	0.
240	1	0.	12492.*	0.	0.	0.	0.

* BASED ON DWT LOAD from JOB 3823

Calc. 1-1 R.1
Att. 1

ATTACHMENT NO. 4 p 9

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" MODELED AS "A/B"

INPUT DATA ECHO

```
 STMT   ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
NUMBER          0         0         0         0         0         0         0         0
    1   PECO PBAPS UNIT#2  03040-NP(C)-PM-786 (RERATE) MS "D" MODELED AS "A/B"
    2   CONTROL              5    2.                   1.          .001
    3   CONTROL                   1.                                        1.
    4   FLEXAN         1     1    3.
    5   DEADWEIGHT
    6   FLEXAN         2     1    2.
    7   THERMAL ANALYSIS (NORMAL)  551 DEG F
    8   FLEXAN         3     2    2.
    9   THERMAL ANALYSIS (MAXIMUM) 583 DEG F
   10   FLEXAN         4     1       18.       300.       200.        3.
   11   FT = FLUID TRANSIENT DUE TO TURBINE TRIP
   12   FFLEXAN        5     1        5.        20.        20.        1.
   13   FFLEXAN       -1
   14   X DIRECTION OBE EARTHQUAKE
   15   FFLEXAN        6     1        6.        20.        20.        2.
   16   FFLEXAN       -1
   17   Y DIRECTION OBE EARTHQUAKE
   18   FFLEXAN        7     1        7.        20.        20.        1.
   19   FFLEXAN       -1
   20   Z DIRECTION OBE EARTHQUAKE
   21   MODFLEX        8  5 6         1.         1.         1.
   22   ABS(X+Y) OBE EARTHQUAKE
   23   MODFLEX        9  6 7         1.         1.         1.
   24   ABS(Y+Z) OBE EARTHQUAKE
   25   MODFLEX       10  8 9         1.         1.         4.
   26   OBEI      MAX OF ABS(X+Y) OR ABS(Y+Z) OBE EARTHQUAKE COMBINATIONS
   27   MODFLEX       11 10          2.4
   28   SSEI      MAX OF ABS(X+Y) OR ABS(Y+Z) SSE EARTHQUAKE COMBINATIONS
   29   MODFLEX       12  410         1.         1.         4.
   30   UPSET     MAX OF (OBEI OR FT)
   31   MOD           13  1 2         1.         1.
   32   ALG.SUM (DWT,TH NORM)
   33   MOD           14  1 3         1.         1.
   34   ALG.SUM (DWT,TH MAX)
   35   MOD           15  113         1.         1.         3.
   36   LC#1       MAX. VALUE (DWT,(DWT+TH NORM))
   37   MOD           16  114         1.         1.         3.
   38   MAX. VALUE (DWT,(DWT+TH MAX))
   39   MOD           17 1213         1.         1.         1.
   40   LC#2       ABS.SUM(DWT OR (DWT+TH NORM), (OBEI OR FT)
   41   MOD           18 1116         1.         1.         1.
   42   LC#3       ABS.SUM(DWT OR (DWT+TH MAX),SSEI)
   43   TITLE              1
   44   AMPLIFIED RESPONSE SPECTRA (ARS) - RB EL.135'-165',TB EL.150'- 165'.5% DAMPING
   45   SPEC           1     1    0.010      .12       .033       .12       .037       .15
   46   SPEC           1     1     .045      .20       .077       .33       .100       .60
   47   SPEC           1     1     .111     1.92       .125      1.92       .133      2.27
   48   SPEC           1     1     .164     2.27       .167      2.09       .196       .64
   49   SPEC           1     1     .244      .36       .435       .29       .833       .29
   50   SPEC           1     1    1.220      .13     10.000       .00
        ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
                  0         0         0         0         0         0         0         0
```

ATTACHMENT NO. 4 P/O

Calc. 1-1 R. 1 App. 1

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" MODELED AS "A/B"

INPUT DATA ECHO

STMT NUMBER									
		0	0	0	0	0	0	0	0
51	SPEC	1	3	0.010	.10	.033	.10	.037	.15
52	SPEC	1	3	.045	.23	.071	.36	.091	.84
53	SPEC	1	3	.095	1.89	.111	1.89	.118	.93
54	SPEC	1	3	.122	1.09	.133	2.27	.164	2.27
55	SPEC	1	3	.167	2.09	.196	.64	.238	.39
56	SPEC	1	3	.500	.39	.769	.36	1.250	.12
57	SPEC	1	3	10.00	.00				
58	TITLE		2						
59	AMPLIFIED RESPONSE SPECTRA (ARS) - (2/3) GROUND SPECTRA .5% DAMPING								
60	SPEC	2	2	.000	.043	.025	.043	.033	.06
61	SPEC	2	2	.050	.087	.100	.113	.111	.122
62	SPEC	2	2	.125	.133	.143	.153	.167	.167
63	SPEC	2	2	.182	.173	.222	.173	.250	.167
64	SPEC	2	2	.333	.153	.500	.113	1.000	.057
65	SPEC	2	2	10.000	.057				
66	XSE26STM		1	26.00	1.086	317.0	29.9	1115.	1.
67	XSE6"WTR		2	6.625	.432	50.5	27.9	1115.	2.
68	XSEAOVDUM		3	26.00	1.086	.001	29.9	0.	3.
69	XSE14STM		4	14.00	.750	123.0	27.9	1115.	3.
70	XSE28STM		5	28.00	1.375	.001	29.9	1115.	3.
71	OPV551	1	1	27.04	.04120				
72	OPV551	1	2	26.04	.04120				
73	OPV583	2	1	26.82	.04433				
74	OPV583	2	2	25.82	.04433				
75	ANCHOR		5	-11.00	138.15	45.00			
76	MARKNO	FLUED HEAD PEN N-7D							
77	RUN	5	10			2.583	1.	1.	1.9
78	VALVE	10	15			3.583			
79	VALVE	15	20			1.250			
80	ELBOW	20	35						
81	DUMMY				.1521	.9884			
82	ELBOW	35	40			3.02			
83	DUMMY				.9884	.1521			
84	ELBOW	40	45						
85	RUN	45	54		.521				
86	RUN	54	56		4.161				
87	RUN	56	60		2.926				
88	RUN	60	65		5.074				
89	ELBOW	65	70						
90	RUN	70	75			5.833			
91	RESTRAINT		75		1500				
92	MARKNO	1DB-H1							
93	RUN	75	76			3.292			
94	RUN	76	80			5.403			
95	RUN	80	82			3.847			
96	RUN	82	90			5.542			
97	RUN	90	95			6.028			
98	RUN	95	100			6.028			
99	RESTRAINT		100		2160				
100	MARKNO	1DB-H2							
		0	0	0	0	0	0	0	0

ATTACHMENT NO. 4 P11

Calc 1-1 R1 App. 1

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" MODELED AS "A/B"

INPUT DATA ECHO

STMT NUMBER									
	----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8								
	0	0	0	0	0	0	0	0	
101	RUN	100	105			1.943			
102	SNUBBER		105	1.0E8					
103	MARKNO	1DB-S2A							
104	RUN	105	110			5.833			
105	ELBOW	110	115						
106	RUN	115	125	-6.646					
107	RESTRAINT		125		1.0E8				
108	MARKNO	1DB-H3							
109	RUN	125	130	-4.451					
110	RUN	130	135	-4.451					
111	RUN	135	140	-4.451					
112	RESTRAINT		140		1.0E8				
113	MARKNO	1DB-H4							
114	RUN	140	145	-6.295					
115	RUN	145	150	-6.295					
116	RUN	150	155	-6.295					
117	RUN	155	160	-6.295					
118	RUN	160	165	-6.295					
119	RUN	165	170	-6.295					
120	RESTRAINT		170		1.0E8				
121	MARKNO	1DB-H5							
122	RUN	170	175	-4.771					
123	RUN	175	180	-4.771					
124	RUN	180	185	-4.771					
125	RUN	185	190	-4.771					
126	RUN	190	195	-4.771					
127	RUN	195	200	-4.771					
128	RUN	200	205	-4.771					
129	RUN	205	210	-4.771					
130	RESTRAINT		210		1.0E8				
131	MARKNO	1DB-H6							
132	RUN	210	215	-6.333					
133	RUN	215	220	-6.333					
134	RUN	220	225	-6.333					
135	RUN	225	230	-6.333					
136	RUN	230	235	-6.333					
137	RUN	235	240	-6.333					
138	RESTRAINT		240		1.000				
139	MARKNO	1DB-H7							
140	RUN	240	245	-3.104					
141	RUN	245	250	-3.104					
142	SNUBBER		250			1.0E8			
143	MARKNO	1DB-S7A							
144	RUN	250	255	-4.594					
145	RUN	255	260	-4.594					
146	ELBOW	260	265						
147	RUN	265	270			5.792			
148	RUN	270	275			5.792			
149	RESTRAINT		275		1.000				
150	MARKNO	1DB-H9B							
	----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8								
	0	0	0	0	0	0	0	0	

ATTACHMENT NO. 4 P 12

Calc. 1-1 R. 1
App. 1

PECO PBAPS UNIT#2 03040-NP(C)-BM-786 (RERATE) MS "D" MODELED AS "A/B"

INPUT DATA ECHO

STMT NUMBER		1 0	2 0	3 0	4 0	5 0	6 0	7 0	8 0
151	RUN	275	280			5.108			
152	RUN	280	285			5.108			
153	RUN	285	290			5.108			
154	RUN	290	295			5.108			
155	RUN	295	300			5.108			
156	RUN	300	305			5.108			
157	RESTRAINT		305		3000				
158	MARKNO	1DB-H10							
159	RUN	305	310			6.047			
160	RUN	310	315			6.047			
161	RUN	315	320			6.047			
162	RUN	320	325			6.047			
163	RESTRAINT		325		2160				
164	MARKNO	1DB-H11							
165	RUN	325	330			4.325			
166	RUN	330	335			4.325			
167	RUN	335	340			4.325			
168	RESTRAINT		340		3000				
169	MARKNO	1DB-H12							
170	RUN	340	345			4.443			
171	ELBOW	345	350						
172	RUN	350	355	4.875					
173	RUN	355	360	5.049					
174	RUN	360	365	5.049				1.3	
175	RUN	365	370	5.049				1.3	
176	RESTRAINT		370		2400				
177	MARKNO	1DB-H13							
178	RUN	370	375	3.302					
179	RUN	375	380	3.302				1.3	
180	RUN	380	385	1.000					
181	RUN	385	390	1.000				1.9	
182	RESTRAINT		390		1.0E8		1.0E10		
183	SNUBBER		390	1.0E8		1.0E8		1.0E10	1.0E10
184	MARKNO	MSV-4 (INLET)							
185	VALVE	15	25		-2.758	-2.758	3.		
186	MVALVE	25	30		-3.960	-3.960			
187	RUN	35	36		-2.29		2.	2.	3.02
188	RUN	355	356		2.583		4.	2.	
189	TEE	355	356	1.7					
190	RUN	385	386		-2.29		2.	2.	
191	TEE	385	386	1.41					
192	VALVE	390	400	11.083	-12.646		5.	1.	
193	RUN	400	405		-11.927				
194	RUN	405	410		-11.927				
195	ELBOW	410	415	11.000					
196	RUN	415	425	17.958					
197	RUN	425	435	17.958					
198	ELBOW	435	440	11.000					
199	RUN	440	450		12.950				
200	RUN	450	455		12.950				
		1 0	2 0	3 0	4 0	5 0	6 0	7 0	8 0

ATTACHMENT NO. 4 p 13

Calc. 1-1 R. 1
App. I

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" MODELED AS "A/B"

INPUT DATA ECHO

STMT NUMBER													
		1	2	3	4	5	6	7	8				
		0	0	0	0	0	0	0	0				
201	RUN	455	460		12.950								
202	RUN	460	470		12.950								
203	ELBOW	470	475										
204	RUN	475	480			-4.08							
205	ANCHOR		480										
206	LMASS	10	54	56	76	82	105	125	140	170	210	240	250
207	LMASS	275	305	325	340	370							
208	LMASS	15	25	30	35	36	40	60	65	75	80		
209	LMASS	90	95	100	110	130	135	145	150	155	160	165	
210	LMASS	175	180	185	190	195	200	205	215	220	225	230	235
211	LMASS	245	255	260	270	280	285	290	295	300	310	315	
212	LMASS	320	330	335	345	355	356	360	365	375	380	385	386
213	CWEVLVBODY		25			8060.							
214	CWEVLVOPER		30			2015.							
215	CWEHGR R5		40			580.							
216	CWEREST 4		54			1080.							
217	CWEREST 3		56			1080.							
218	CWEREST 2		76			1080.							
219	CWEREST 1		82			170.							
220	CWEHGR H1		75			109.							
221	CWEHGR H2		100			109.							
222	CWEHGR H11		325			109.							
223	CWEHGR H12		340			109.							
224	CWEHGR S2A		105			620.							
225	CWEHGR H3		125			330.							
226	CWEHGR H4		140			300.							
227	CWEHGR H5		170			300.							
228	CWEHGR H6		210			300.							
229	CWEHGR H7		240			300.							
230	CWEHGR H9B		275			300.							
231	CWEHGR S7A		250			1450.							
232	CWEHGR H10		305			162.							
233	CWEHGR H13		370			220.							
234	CWE14"PIPE		356			1970.							
235	CWE4"PIPE		380			170.							
236	FORCE	1	75			8887.							
237	FORCE	1	100			6125.							
238	FORCE	1	305			8697.							
239	FORCE	1	325			6434.							
240	FORCE	1	340			8571.							
241	FORCE	1	370			7200.							
242	FORCE	1	275			8657.							
243	FORCE	1	240			12492.							
244	TFORCE	7	10				-.25						
245	TFORCE	8	15				-1.00						
246	TFORCE	9	65			-1.00							
247	TFORCE	10	110				-1.00						
248	TFORCE	11	260		1.00								
249	TFORCE	12	345				-1.00						
250	TFORCE	13	360		-1.00								
		1	2	3	4	5	6	7	8				
		0	0	0	0	0	0	0	0				

Calc. 1-1 R.1
App. 1

ATTACHMENT NO. 4 p14

PECO PBAPS UNIT#2 03040-NP(C)-PM-786 (RERATE) MS "D" MODELED AS "A/B"

INPUT DATA ECHO

```
 STMT    ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
NUMBER           0         0         0         0         0         0         0         0
   251   9CN           1         12
   252   9CF           1         11
   253   10CASES       2    3
   254   SUMMARY       1    2    3    4   10   11
   255   SUPPORT       1   10        11    2    3    4   15   17   18
   256   STITLE
   257   STITLE    MS "D" MODELED AS "A/B"
   258   STITLE    03040-NP(C)-PM-786
   259   ALLDONE
   260    STORED AS:  FCC.PM786.W09B7:072
   261   ALLDONE
```

Calc. 1-1 R.1
Att. 1

ATTACHMENT NO. 4 P15

Calc. 1-1 Rev 1
APP 2 Computer Run
For V3 spring setting changes

[redacted]

E
D
C
B
A

Calc. 1-1 R.1
~~03040-NP(c)-fm-186~~
ATTACHMENT 5 p1 of 1

Calc. 1-1 REV. 1
App. 1 Computer Room
page 107 of 107

Boorum™

212-40 T
MADE IN U.S.A. PATENT NO. 3,643,360

*** ACTION REQUEST *** PAGE: 01

A/R TYPE : EC ECR
REQUEST ORG : SMS
REQUEST DATE: 22SEP03
REQUESTED BY: WRIGHT, RM

A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

==========

EVALUATION NBR: 02
EVALUATING ORG: PEDM
EVAL ASIGND TO: KAZOUN, M MS OC
EVAL REQUEST ORG: PEX
EVAL REQUESTOR: KARASEK, M
EVAL RETURNED BY: JORDAN

ORIG DATE ASSIGNED:
EVAL DUE DATE: 30SEP03
DATE ASSIGNED: 23SEP03
EVAL STATUS : COMPLT

IMPORTANCE CODE: O OEAP: SCHEDULE CODE: 3R14 DATE FIXED:

EVAL DESC: EVALUATE THE AS-FOUND CONDITIONS OF MAIN STEAM SUPPORTS

PLEASE PERFORM AN ENGINEERING EVALUATION OF THE AS-FOUND	MAC0 23SEP03
CONDITION OF THE MAIN STEAM SPRING HANGERS (1DB-H32,	MAC0 23SEP03
1DB-H34, 1DB-H43, 1DB-H44, AND 1DB-H46) AS DESCRIBED IN	MAC0 23SEP03
AR A1435400, A1435401, A1435403, A1435404, AND A1435406.	MAC0 23SEP03
THE RESULTS OF THE EVALUATION WILL BE USED TO DETERMINE	MAC0 23SEP03
IF ADDITIONAL SUPPORTS SHOULD BE INSPECTED TO MEET THE	MAC0 23SEP03
REQUIREMENTS FOR ASME SECTION XI INSPECTIONS FOR 3R14.	MAC0 23SEP03
IF REQUIRED, ADDITIONAL SUPPORTS WILL BE SELECTED IN	MAC0 23SEP03
ACCORDANCE WITH CODE CASE N-491-1 REQUIREMENTS.	MAC0 23SEP03
.	MAC0 23SEP03
.	JSB2 26SEP03
.	JSB2 26SEP03
.	JSB2 26SEP03
ENGINEERING TECHNICAL EVALUATION	JSB2 26SEP03
==========	JSB2 26SEP03
.	JSB2 26SEP03
.	JSB2 26SEP03
REASON FOR EVALUATION / SCOPE	JSB2 26SEP03
----------	JSB2 26SEP03
.	JSB2 26SEP03
THE ISI PROGRAM MANAGER HAS REQUESTED ENGINEERING TO	JSB2 26SEP03
EVALUATE THE AS-FOUND SPRING SETTINGS FOR MAIN STEAM	JSB2 26SEP03
SUPPORTS 1DB-H32, 1DB-H34, 1DB-H43, 1DB-H44, AND 1DB-H46.	JSB2 26SEP03
THE SUBJECT SUPPORTS WERE FOUND TO BE BEYOND THE 10%	JSB2 26SEP03
ACCEPTANCE TOLERANCE BASED ON THE ISI INSPECTION PROGRAM.	JSB2 26SEP03
INFORMATION FOR THESE SUPPORTS IS PROVIDED IN A/R'S	JSB2 26SEP03
A1435400, A1435401, A1435403, A1435404, AND A1435406.	JSB2 26SEP03
.	JSB2 26SEP03
.	JSB2 26SEP03
DETAILED EVALUATION	JSB2 26SEP03
----------	JSB2 26SEP03
.	JSB2 26SEP03
THE ABOVE-IDENTIFIED SUPPORTS ARE PART OF THE (4) MAIN	JSB2 26SEP03
STEAM SYSTEM PIPING, OUTSIDE PRIMARY CONTAINMENT, WHICH	JSB2 26SEP03
RUNS FROM THE CONTAINMENT PENETRATION (N-7A,B,C,D),	JSB2 26SEP03
THROUGH THE MSIV VALVES (AO-86A,B,C,D) TO THE TURBINE	JSB2 26SEP03
STOP VALVES AND CONTROL VALVES, TO THE HIGH-PRESSURE	JSB2 26SEP03
TURBINE INLET. BASED ON INFORMATION PROVIDED TO	JSB2 26SEP03
ENGINEERING A NUMBER OF TASKS WERE PERFORMED TO ADDRESS	JSB2 26SEP03
THIS ISSUE:	JSB2 26SEP03
.	JSB2 26SEP03
1. A WALKDOWN WAS REQUESTED AND PERFORMED (BY NDE) TO	JSB2 26SEP03

Calc. 1-1 R.1 Att-2, P. 2

*** ACTION REQUEST *** PAGE: 02

A/R TYPE : EC ECR
REQUEST ORG : SMS
REQUEST DATE: 22SEP03
REQUESTED BY: WRIGHT, RM

A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

VERIFY COLD SETTINGS ON ALL SPRING CANS ON THE MAIN STEAM	JSB2 26SEP03
PIPING OUTSIDE CONTAINMENT.	JSB2 26SEP03
.	JSB2 26SEP03
2. A PIPING ANALYSIS CALCULATION IS PRESENTLY NOT	JSB2 26SEP03
AVAILABLE. THEREFORE, A NEW ME-101 ANALYSIS WAS	JSB2 26SEP03
RECREATED, OR RECONSTITUTED, MODELING THE MAIN STEAM	JSB2 26SEP03
PIPING, INCLUDING THE STOP VALVES, CONTROL VALVES AND	JSB2 26SEP03
BYPASS VALVES. THE MODELING WAS BASED ON THE HISO (HSO)	JSB2 26SEP03
DRAWINGS, SUPPORT DETAIL DRAWINGS, AND GE DRAWINGS FOR	JSB2 26SEP03
THE STOP AND CONTROL VALVES, AND PIPE ROUTING BETWEEN THE	JSB2 26SEP03
STOP AND CONTROL VALVES TO THE HP TURBINE INLETS.	JSB2 26SEP03
.	JSB2 26SEP03
3. TWO ANALYSES WERE PERFORMED:	JSB2 26SEP03
- FIRST ANALYSIS IS PERFORMED USING DESIGN	JSB2 26SEP03
SETTINGS FOR ALL SPRING HANGERS IN THE	JSB2 26SEP03
MAIN STEAM SYSTEM OUTSIDE CONTAINMENT, BASED	JSB2 26SEP03
ON DESIGN DETAIL DRAWINGS.	JSB2 26SEP03
- SECOND ALAYSIS IS PERFORMED USING	JSB2 26SEP03
AS-FOUND SETTINGS FOR THE SPRINGS, BASED ON	JSB2 26SEP03
INFORMATION OBTAINED FROM THE NDE WALKDOWN.	JSB2 26SEP03
- IT SHOULD BE NOTED THAT (2) SUPPORTS WERE NOT	JSB2 26SEP03
ACCESSIBLE DURING THE WALKDOWN PERFORMED BECAUSE	JSB2 26SEP03
OF SCAFFOLDING (7DB-H74 AND 7DBH77). FOR THESE	JSB2 26SEP03
TWO SUPPORTS, THE DESIGN VALUES WERE USED FOR COLD	JSB2 26SEP03
SETTINGS. IT WAS JUDGED THAT THE USE OF DESIGN	JSB2 26SEP03
VALUES VERSUS AS-FOUND VALUES WILL NOT ADVERSELY	JSB2 26SEP03
AFFECT THE RESULTS OF THE ANALYSIS.	JSB2 26SEP03
.	JSB2 26SEP03
4. FOR THE IDENTIFIED CONDITION, THE ISSUE OF CONCERN IS	JSB2 26SEP03
NORMAL OPERATING CONDITIONS, SINCE SPRING HANGERS HAVE	JSB2 26SEP03
RELATIVELY LOW STIFFNESS, AND PROVIDE LITTLE RESISTANCE	JSB2 26SEP03
DURING A SEISMIC EVENT. THEREFORE, THE ME-101 ANALYSIS	JSB2 26SEP03
PERFORMED EVALUATES THE SUPPORTS FOR DEADWEIGHT AND	JSB2 26SEP03
THERMAL LOADS ONLY.	JSB2 26SEP03
.	JSB2 26SEP03
5. DESIGN ATTRIBUTES (CC-AA-102) CONSIDERED FOR THIS	JSB2 26SEP03
TECHNICAL EVALUATION ARE:	JSB2 26SEP03
.	JSB2 26SEP03
BASIS FUNCTION	JSB2 26SEP03
----------	JSB2 26SEP03
THE MAIN STEAM SYSTEM IS DESIGNED:	JSB2 26SEP03
.	JSB2 26SEP03
- TO DELIVER STEAM FROM THE NUCLEAR BOILER TO THE MAIN	JSB2 26SEP03
TURBINE AT RATED FLOW, TEMPERATURE, AND PRESSURE FROM	JSB2 26SEP03
TURBINE WARM-UP TO VALVES WIDE OPEN.	JSB2 26SEP03
.	JSB2 26SEP03
- TO PROVIDE STEAM TO THE STEAM JET AIR EJECTORS	JSB2 26SEP03
(SJAE'S), STEAM SEAL REGULATOR, REACTOR FEED PUMP	JSB2 26SEP03
TURBINES (RFPT'S), OFF GAS RECOMBINER PREHEATER, AND	JSB2 26SEP03
CONDENSER HOTWELL DEAERATING STEAM COILS.	JSB2 26SEP03
.	JSB2 26SEP03
- TO BYPASS STEAM TO THE CONDENSERS DURING STARTUP AND	JSB2 26SEP03

A/R TYPE : EC ECR
REQUEST ORG : SMS
REQUEST DATE: 22SEP03
REQUESTED BY: WRIGHT, RM

A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

WHEN REACTOR STEAM PRODUCTION IS GREATER THAN REQUIRED BY	JSB2 26SEP03
THE TURBINE-GENERATOR.	JSB2 26SEP03
.	JSB2 26SEP03
THE MAIN STEAM SYSTEM CONSISTS OF FOUR 26-INCH CARBON	JSB2 26SEP03
STEEL LINES FROM THE OUTBOARD MAIN STEAM ISOLATION VALVES	JSB2 26SEP03
(MSIV'S) TO THE TURBINE STOP VALVES. FOUR MAIN STEAM	JSB2 26SEP03
LINES ARE USED TO SUPPLY STEAM TO THE MAIN TURBINE. THIS	JSB2 26SEP03
ALSO PERMITS TESTING OF INDIVIDUAL TURBINE STOP VALVES	JSB2 26SEP03
AND MSIVS WITH ONLY A MINIMUM LOAD REDUCTION. EACH MAIN	JSB2 26SEP03
STEAM LINE ALSO HAS A 14-INCH PRESSURE EQUALIZING LINE	JSB2 26SEP03
THAT CONNECTS TO A BYPASS VALVE CHEST VIA TWO 18-INCH	JSB2 26SEP03
HEADERS. THE BYPASS VALVES DIRECT STEAM TO THE MAIN	JSB2 26SEP03
CONDENSER IN ORDER TO PREVENT AN OVERPRESSURE CONDITION	JSB2 26SEP03
AND SUBSEQUENT OPENING OF THE SAFETY RELIEF VALVES	JSB2 26SEP03
(SRV'S) AT ANY TIME WHEN REACTOR STEAM PRODUCTION EXCEEDS	JSB2 26SEP03
TURBINE-GENERATOR REQUIREMENTS SUCH AS TURBINE STARTUP,	JSB2 26SEP03
SHUTDOWN, ELECTRIC LOAD REJECTION, OR TURBINE TRIP.	JSB2 26SEP03
.	JSB2 26SEP03
THE ABOVE PIPING IS THE PART OF THE MAIN STEAM SYSTEM	JSB2 26SEP03
AFFECTED BY THIS TECHNICAL EVAL. QUALIFICATION OF PIPING	JSB2 26SEP03
AND SUPPORT STRESSES TO WITHIN APPLICABLE CODE	JSB2 26SEP03
REQUIREMENTS ENSURES PRESSURE BOUNDARY FUNCTION, AND THAT	JSB2 26SEP03
THE SYSTEM WILL PERFORM ITS DESIGN FUNCTION.	JSB2 26SEP03
.	JSB2 26SEP03
SEISMIC/SAFETY/ISI CLASSIFICATION	JSB2 26SEP03
---	JSB2 26SEP03
THE AFFECTED PORTION OF THE MAIN STEAM PIPING IS	JSB2 26SEP03
CLASSIFIED AS SAFETY RELATED, ISI, AND SEISMIC. FOR	JSB2 26SEP03
PURPOSES OF THIS TECHNICAL EVALUATION THE AFFECTED	JSB2 26SEP03
SUPPORTS ARE SAFETY RELATED AND ISI, BUT ARE NOT	JSB2 26SEP03
TYPICALLY DESIGNED TO PROVIDE SEISMIC RESTRAINT SINCE	JSB2 26SEP03
SPRING HANGERS HAVE RELATIVELY LOW STIFFNESS AS COMPARED	JSB2 26SEP03
TO RIGID SUPPORTS. SPRING HANGERS ARE GENERALLY DESIGNED	JSB2 26SEP03
IN A SYSTEM TO ALLOW FREEDOM OF MOVEMENT OF THE PIPING	JSB2 26SEP03
FOR HIGH TEMPERATURE SYSTEMS, SUCH AS MAIN STEAM.	JSB2 26SEP03
SNUBBERS, OR DYNAMIC LOCKING RESTRAINTS ARE TYPICALLY	JSB2 26SEP03
DESIGNED WITHIN A SYSTEM TO COMPLIMENT SPRING HANGERS.	JSB2 26SEP03
THE AFFECTED PORTION OF THE MS SYSTEM IS ALSO PROVIDED	JSB2 26SEP03
WITH SNUBBERS TO PROVIDE RESTRAINT FOR THE PIPING AGAINST	JSB2 26SEP03
DYNAMIC EVENTS. RIGID SUPPORTS ARE EVALUATED TO ENSURE	JSB2 26SEP03
NO SIGNIFICANT EFFECT AS A RESULT OF THE IDENTIFIED	JSB2 26SEP03
CONDITION. THEREFORE, THE DYNAMIC CONFIGURATION (AND	JSB2 26SEP03
CONSEQUENTLY B31.1 CODE EQ'S 12U AND 12F) IS NOT CHANGED	JSB2 26SEP03
BY THIS ACTIVITY.	JSB2 26SEP03
.	JSB2 26SEP03
SPECIFICATIONS	JSB2 26SEP03
---	JSB2 26SEP03
PER SPECIFICATION M-300, THE FOLLOWING ARE DESIGN	JSB2 26SEP03
CONDITIONS FOR THE MAIN STEAM PIPING:	JSB2 26SEP03
.	JSB2 26SEP03
MS & TURBINE:	JSB2 26SEP03
.	JSB2 26SEP03

*** ACTION REQUEST *** PAGE: 04

A/R TYPE : EC ECR
REQUEST ORG : SMS
REQUEST DATE: 22SEP03
REQUESTED BY: WRIGHT, RM

A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

		DESIGN RATING		NORM RATING		MAX.	
							JSB2 26SEP03
	PIPE	PRESS	TEMP	PRESS	TEMP	PRESS	JSB2 26SEP03
DESCR.	CLASS	(PSI)	(F)	(PSI)	(F)	(PSI)	JSB2 26SEP03
AO-80 -	DBN	1115	583	1038	551	583	JSB2 26SEP03
AO-86							JSB2 26SEP03
AO-86 -	DB	1115	583	1038	551	583	JSB2 26SEP03
TSV'S							JSB2 26SEP03

.

NOTE:***
THE ABOVE CONDITIONS INCLUDE RERATE, WHICH WAS NOT INCLUDED IN THE ORIGINAL DESIGN OF THE MAIN STEAM PIPING.

.

THE FOLLOWING ARE MATERIAL ATTRIBUTES FOR CLASS DBN AND CLASS DB:

.

MATERIAL: 26" - ASTM A-672 GR. C-70 CLASS 22 (CS)
24" & SMALLER: - ASTM A-106 GR. B

THICKNESS: 26" - 0.95" MIN. WALL
(1.25" THICK 28" DIA FROM MSV TO TURBINE)
24" & SMALLER: SCHEDULE 80

.

BASED ON THE ABOVE, THE FOLLOWING INPUT PARAMETERS ARE USED FOR MS PIPING (BASED ON GRINNELL):

.

		WEIGHT		
OD	THICK	PIPE	INSUL	TOTAL
26"	0.95	254	30	284
14"	0.75	106	18	124
28"	1.25	357	32	389

.

AFFECTED CALCULATION

STRESS CALCULATION 1-1 IS AFFECTED BY THE AS-FOUND CONDITIONS OF THE SPRINGS. THIS CALCULATION IS STILL IN PROCESS OF BEING RECONSTRUCTED. THE ABOVE-IDENTIFIED CONDITION WILL BE ADDRESSED IN A PRELIMINARY ANALYSIS, AND DOCUMENTED IN THIS TECHNICAL EVALUATION. ACCEPTANCE CRITERIA FOR THE IDENTIFIED CONDITION IS:

.

A. REVIEW OF PIPING TO VERIFY THAT EQ. 11 STRESSES ARE WITHIN CODE REQUIREMENTS.

B. REVIEW OF THE PIPING DEADWEIGHT MOVEMENTS TO ENSURE THAT THERE ARE NO EXCESSIVE MOVEMENTS AS A RESULT OF THE CONDITION.

C. REVIEW AND COMPARISON OF SUPPORT LOADS TO ENSURE THAT THE LOADS MEET ONE OR MORE OF THE FOLLOWING CRITERIA:
SUPPORT LOADS ARE MINIMALLY IMPACTED BY THE AS FOUND SETTINGS.

A/R TYPE : EC ECR
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A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

- SUPPORT LOADS ARE WITHIN DESIGN LOADS PROVIDED IN	JSB2 26SEP03
THE ASSOCIATED SUPPORT DETAIL DRAWING.	JSB2 26SEP03
- IF THE ABOVE ARE NOT MET REVIEW SUPPORTS TO VERIFY	JSB2 26SEP03
QUALIFICATION TO THE APPLICABLE CODES AND	JSB2 26SEP03
STANDARDS.	JSB2 26SEP03
D. IT SHOULD BE NOTED THAT (2) EVALUATIONS WERE RUN.	JSB2 26SEP03
THE FIRST WAS TO INPUT THE AS-FOUND SPRING COLD LOADS,	JSB2 26SEP03
AND COMPARE THOSE LOADS WITH A LOAD CASE WHICH INPUTS THE	JSB2 26SEP03
AS DESIGN COLD LOADS. THE SECOND ANALYSIS TOOK THE	JSB2 26SEP03
AS-FOUND COLD LOADS, AND COMPUTATED NEW HOT LOADS, BASED	JSB2 26SEP03
ON THE DIFFERENCES BETWEEN HOT AND COLD LOADS AS PROVIDED	JSB2 26SEP03
IN THE DESIGN DRAWINGS. THE NEW HOT LOADS ARE EVALUATED	JSB2 26SEP03
FOR CONFORMANCE AS DESCRIBED ABOVE.	JSB2 26SEP03
.	JSB2 26SEP03
THE ABOVE CONDITIONS WILL BE DOCUMENTED IN THIS TECH	JSB2 26SEP03
EVAL, AND THE RECONSTITUTED STRESS ANALYSIS FOR CALC 1-1	JSB2 26SEP03
WHICH WILL CONSIDER THE AS-FOUND SPRING SETTINGS.	JSB2 26SEP03
.	JSB2 26SEP03
WALKDOWNS	JSB2 26SEP03
---------	JSB2 26SEP03
WALKDOWNS ARE PERFORMED TO VERIFY THE FIELD COLD LOAD	JSB2 26SEP03
SETTINGS ON ALL SPRINGS WITHIN THE AFFECTED PORTION OF	JSB2 26SEP03
THE MAIN STEAM SYSTEM TO BE USED FOR INPUT TO THE ME-101	JSB2 26SEP03
COMPUTER ANALYSIS.	JSB2 26SEP03
.	JSB2 26SEP03
6. ME-101 RESULTS:	JSB2 26SEP03
THE RESULTS OF THE ANALYSES WERE COMPARED TO IDENTIFY ANY	JSB2 26SEP03
SIGNIFICANT CHANGES IN THE PIPING SYSTEM OR STRESSES. IN	JSB2 26SEP03
ADDITION, RESULTS OF THE AS FOUND ANALYSIS WERE EVALUATED	JSB2 26SEP03
FOR CODE ACCEPTABILITY, AND AGAINST DESIGN SUPPORT	JSB2 26SEP03
LOADINGS BASED ON SUPPORT DRAWINGS. THE FOLLOWING ARE	JSB2 26SEP03
RESULTS OF THE EVALUATION:	JSB2 26SEP03
.	JSB2 26SEP03
A. PIPING STRESSES ARE WELL WITHIN B31.1 CODE	JSB2 26SEP03
REQUIREMENTS FOR EQUATION 11. THE MAXIMUM STRESS WAS	JSB2 26SEP03
IDENTIFIED TO BE AT THE INLET NOZZLE TO THE "B" MSV (NODE	JSB2 26SEP03
BSV), AND IS 8365 PSI, WHICH IS LESS THAN THE CODE	JSB2 26SEP03
ALLOWABLE OF 15,000 PSI. THE RESULTING MARGIN IS 0.44.	JSB2 26SEP03
THIS ANALYSIS WAS FOR EVALUATION OF HOT LOAD SETTINGS.	JSB2 26SEP03
THE COLD LOADS RESULTS ARE ENVELOPED BY THE HOT LOADS,	JSB2 26SEP03
AND NEED NO FURTHER EVALUATION.	JSB2 26SEP03
.	JSB2 26SEP03
B. PIPING WEIGHT MOVEMENTS WERE REVIEWED AND FOUND TO BE	JSB2 26SEP03
SMALL AND ACCEPTABLE. MOST PIPE MOVEMENTS ARE LESS THAN	JSB2 26SEP03
0.1". THE MOVEMENTS IN THE VICINITY OF HANGERS H10 TO	JSB2 26SEP03
H12 (A LOOP), AND H22 (B LOOP) ARE SLIGHTLY GREATER THAN	JSB2 26SEP03
0.10", BUT ARE LESS THAN 0.150", AND ARE CONSIDERED TO BE	JSB2 26SEP03
ACCEPTABLE GIVEN THE PIPE SIZE, THE LENGTH OF RUN OF THE	JSB2 26SEP03
PIPING, AND CONSIDERING THAT THE PIPING IS ALREADY IN ITS	JSB2 26SEP03
AS-INSTALLED STATE.	JSB2 26SEP03
.	JSB2 26SEP03
C. REVIEW OF SUPPORT LOADS FOUND MINIMAL EFFECT ON THE	JSB2 26SEP03

Calc. 1-1 R.1 App. 2, P. 6

A/R TYPE : EC ECR
REQUEST ORG : SMS
REQUEST DATE: 22SEP03
REQUESTED BY: WRIGHT, RM

A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

SPRING SUPPORTS, AND THAT MOST RIGID SUPPORTS HAD NO OR	JSB2 26SEP03
INSIGNIFICANT CHANGES (< 10%). ALL SUPPORT LOADINGS WERE	JSB2 26SEP03
REVIEWED AGAINST DESIGN LOADS PROVIDED ON THE ASSOCIATED	JSB2 26SEP03
SUPPORT DETAILS (SEE REFERENCE SUPPORT DRAWINGS). MOST	JSB2 26SEP03
SUPPORTS WERE IDENTIFIED TO HAVE LOADS LESS THAN OR	JSB2 26SEP03
WITHIN 10% OF THE APPROXIMATED LOADING ON THE SUPPORT	JSB2 26SEP03
DETAIL DRAWINGS. NO SUPPORTS WERE IDENTIFIED TO HAVE	JSB2 26SEP03
LOADS THAT EXCEEDED THE MAXIMUM LOADING ON THE SUPPORT	JSB2 26SEP03
DETAILS. BASED ON THESE RESULTS, THE AS-FOUND CONDITIONS	JSB2 26SEP03
ARE CONCLUDED TO BE ACCEPTABLE. FOLLOW UP ACTIONS ARE	JSB2 26SEP03
DISCUSSED IN THE CONCLUSIONS OF THIS TECH EVAL.	JSB2 26SEP03
.	JSB2 26SEP03
.	JSB2 26SEP03
CONCLUSIONS / FINDINGS	JSB2 26SEP03
----------	JSB2 26SEP03
.	JSB2 26SEP03
BASED ON THE EVALUATION PERFORMED, THE AS FOUND CONDITION	JSB2 26SEP03
OF SUPPORTS 1DB-H32, 1DB-H34, 1DB-H43, 1DB-H44, AND	JSB2 26SEP03
1DB-H46 ARE FOUND TO BE ACCEPTABLE WITH NO CORRECTIVE	JSB2 26SEP03
ACTIONS REQUIRED. IN ADDITION, THE AS-FOUND SETTINGS FOR	JSB2 26SEP03
ALL MAIN STEAM SUPPORTS ARE CONCLUDED TO BE ACCEPTABLE	JSB2 26SEP03
BASED ON THE ME-101 RESULTS. PIPING STRESSES ARE WITHIN	JSB2 26SEP03
CODE REQUIREMENTS, AND HANGER LOADS ARE CONCLUDED TO BE	JSB2 26SEP03
WITHIN DESIGN LOADINGS PROVIDED ON THE HANGER DETAIL	JSB2 26SEP03
DRAWINGS. THE FOLLOWING FOLLOW-UP ACTIONS NEED TO BE	JSB2 26SEP03
PERFORMED AS A RESULT OF THIS THE IDENTIFIED CONDITION,	JSB2 26SEP03
AND THIS TECHNICAL EVALUATION:	JSB2 26SEP03
.	JSB2 26SEP03
1. PROVIDE RECONSTITUTED STRESS CALCULATION FOR 1-1.	JSB2 26SEP03
THE CALCULATION SHOULD DOCUMENT THE AS-FOUND SETTINGS,	JSB2 26SEP03
AND THE SEISMIC EVALUATION.	JSB2 26SEP03
.	JSB2 26SEP03
2. PROVIDE DOCUMENTATION OF EVALUATION OF MAIN STEAM	JSB2 26SEP03
SUPPORTS.	JSB2 26SEP03
.	JSB2 26SEP03
3. AFTER PERFORMING STRESS AND SUPPORT ANALYSIS, UPDATE	JSB2 26SEP03
DRAWINGS WITH THE AS-FOUND SETTINGS. THE DRAWING UPDATE	JSB2 26SEP03
SHOULD INCLUDE THE SETTINGS PROVIDED AS FOLLOW UP	JSB2 26SEP03
WALKDOWN OF ALL SUPPORTS ON THE MAIN STEAM PIPING TO	JSB2 26SEP03
TURBINE.	JSB2 26SEP03
.	JSB2 26SEP03
4. ECR 03-00525 HAS BEEN GENERATED TO PERFORM THE ABOVE	JSB2 26SEP03
FOLLOW UP ACTIONS. THE ECR IS ASSIGNED TO PEDM.	JSB2 26SEP03
.	JSB2 26SEP03
.	JSB2 26SEP03
REFERENCES	JSB2 26SEP03
----------	JSB2 26SEP03
.	JSB2 26SEP03
1. ME-101 VERSION N2, MAY, 1993	JSB2 26SEP03
2. ANSI B31.1 POWER PIPING CODE, 1973 INCLUDING S73	JSB2 26SEP03
ADDENDA	JSB2 26SEP03
3. ISO DRAWINGS:	JSB2 26SEP03

A/R TYPE : EC ECR
REQUEST ORG : SMS
REQUEST DATE: 22SEP03
REQUESTED BY: WRIGHT, RM

A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

	A. HSO 171 REV. 2	JSB2 26SEP03
	B. HSO 172 REV. 1	JSB2 26SEP03
	C. HSO 173 REV. 1	JSB2 26SEP03
	D. HSO 174 REV. 1	JSB2 26SEP03
	E. HSO 760 REV. 2	JSB2 26SEP03
4.	HANGER DRAWINGS: (A LOOP)	JSB2 26SEP03
	A. M-2012 SHEET 1 REV. 2	JSB2 26SEP03
	B. M-2012 SHEET 2 REV. 0	JSB2 26SEP03
	C. M-2012 SHEET 3 REV. 0	JSB2 26SEP03
	D. M-2012 SHEET 4 REV. 0	JSB2 26SEP03
	E. M-2012 SHEET 5 REV. 0	JSB2 26SEP03
	F. M-2012 SHEET 6 REV. 0	JSB2 26SEP03
	G. M-2012 SHEET 7 REV. 0	JSB2 26SEP03
	H. M-2012 SHEET 9 REV. 1	JSB2 26SEP03
	I. M-2012 SHEET 10 REV. 0	JSB2 26SEP03
	J. M-2012 SHEET 11 REV. 0	JSB2 26SEP03
	K. M-2012 SHEET 12 REV. 0	JSB2 26SEP03
	L. M-2012 SHEET 13 REV. 0	JSB2 26SEP03
	M. M-2012 SHEET 14 REV. 0	JSB2 26SEP03
	N. M-2012 SHEET 15 REV. 1	JSB2 26SEP03
	O. M-2012 SHEET 16 REV. 1	JSB2 26SEP03
	P. M-2012 SHEET 17 REV. 1	JSB2 26SEP03
5.	HANGER DRAWINGS: (B LOOP)	JSB2 26SEP03
	A. M-2013 SHEET 1 REV. 1	JSB2 26SEP03
	B. M-2013 SHEET 2 REV. 0	JSB2 26SEP03
	C. M-2013 SHEET 3 REV. 0	JSB2 26SEP03
	D. M-2013 SHEET 4 REV. 0	JSB2 26SEP03
	E. M-2013 SHEET 5 REV. 0	JSB2 26SEP03
	F. M-2013 SHEET 6 REV. 0	JSB2 26SEP03
	G. M-2013 SHEET 7 REV. 0	JSB2 26SEP03
	H. M-2013 SHEET 8 REV. 0	JSB2 26SEP03
	I. M-2013 SHEET 9 REV. 0	JSB2 26SEP03
	J. M-2013 SHEET 10 REV 0	JSB2 26SEP03
	K. M-2013 SHEET 11 REV 0	JSB2 26SEP03
	L. M-2013 SHEET 12 REV 0	JSB2 26SEP03
	M. M-2013 SHEET 13 REV 0	JSB2 26SEP03
	N. M-2013 SHEET 14 REV 0	JSB2 26SEP03
6.	HANGER DRAWINGS: (C LOOP)	JSB2 26SEP03
	A. M-2014 SHEET 1 REV. 1	JSB2 26SEP03
	B. M-2014 SHEET 2 REV. 0	JSB2 26SEP03
	C. M-2014 SHEET 3 REV. 0	JSB2 26SEP03
	D. M-2014 SHEET 4 REV. 0	JSB2 26SEP03
	E. M-2014 SHEET 5 REV. 0	JSB2 26SEP03
	F. M-2014 SHEET 6 REV. 0	JSB2 26SEP03
	G. M-2014 SHEET 7 REV. 0	JSB2 26SEP03
	H. M-2014 SHEET 8 REV. 0	JSB2 26SEP03
	I. M-2014 SHEET 9 REV. 0	JSB2 26SEP03
	J. M-2014 SHEET 10 REV 0	JSB2 26SEP03
	K. M-2014 SHEET 11 REV 0	JSB2 26SEP03
	L. M-2014 SHEET 12 REV 0	JSB2 26SEP03
	M. M-2014 SHEET 13 REV 0	JSB2 26SEP03
	N. M-2014 SHEET 14 REV 0	JSB2 26SEP03

Calc. 1-1 R.1 App. 2, P. 8

*** ACTION REQUEST *** PAGE: 08

A/R TYPE : EC ECR
REQUEST ORG : SMS
REQUEST DATE: 22SEP03
REQUESTED BY: WRIGHT, RM

A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

	O. M-2014 SHEET 15 REV 0	JSB2 26SEP03
7.	HANGER DRAWINGS: (C LOOP)	JSB2 26SEP03
	A. M-2014 SHEET 1 REV. 1	JSB2 26SEP03
	B. M-2014 SHEET 2 REV. 0	JSB2 26SEP03
	C. M-2014 SHEET 3 REV. 0	JSB2 26SEP03
	D. M-2014 SHEET 4 REV. 0	JSB2 26SEP03
	E. M-2014 SHEET 5 REV. 0	JSB2 26SEP03
	F. M-2014 SHEET 6 REV. 0	JSB2 26SEP03
	G. M-2014 SHEET 7 REV. 0	JSB2 26SEP03
	H. M-2014 SHEET 8 REV. 0	JSB2 26SEP03
	I. M-2014 SHEET 9 REV. 0	JSB2 26SEP03
	J. M-2014 SHEET 10 REV 0	JSB2 26SEP03
	K. M-2014 SHEET 11 REV 0	JSB2 26SEP03
	L. M-2014 SHEET 12 REV 0	JSB2 26SEP03
	M. M-2014 SHEET 13 REV 0	JSB2 26SEP03
	N. M-2014 SHEET 14 REV 0	JSB2 26SEP03
	O. M-2014 SHEET 15 REV 0	JSB2 26SEP03
8.	HANGER DRAWINGS: (C LOOP)	JSB2 26SEP03
	A. M-2014 SHEET 1 REV. 1	JSB2 26SEP03
	B. M-2014 SHEET 2 REV. 0	JSB2 26SEP03
	C. M-2014 SHEET 3 REV. 0	JSB2 26SEP03
	D. M-2014 SHEET 4 REV. 0	JSB2 26SEP03
	E. M-2014 SHEET 5 REV. 0	JSB2 26SEP03
	F. M-2014 SHEET 6 REV. 0	JSB2 26SEP03
	G. M-2014 SHEET 7 REV. 0	JSB2 26SEP03
	H. M-2014 SHEET 8 REV. 0	JSB2 26SEP03
	I. M-2014 SHEET 9 REV. 0	JSB2 26SEP03
	J. M-2014 SHEET 10 REV 0	JSB2 26SEP03
	K. M-2014 SHEET 11 REV 0	JSB2 26SEP03
	L. M-2014 SHEET 12 REV 0	JSB2 26SEP03
	M. M-2014 SHEET 13 REV 0	JSB2 26SEP03
	N. M-2014 SHEET 14 REV 0	JSB2 26SEP03
	O. M-2014 SHEET 15 REV 0	JSB2 26SEP03
	P. M-2014 SHEET 16 REV 0	JSB2 26SEP03
	Q. M-2014 SHEET 17 REV 0	JSB2 26SEP03
	R. M-2014 SHEET 18 REV 0	JSB2 26SEP03
	S. M-2014 SHEET 19 REV 0	JSB2 26SEP03
	T. M-2014 SHEET 20 REV 0	JSB2 26SEP03
8.	SYSTEM 7 HANGER DRAWINGS:	JSB2 26SEP03
	A. M-2019 SHEET 1 REV. 0	JSB2 26SEP03
	B. M-2019 SHEET 2 REV. 0	JSB2 26SEP03
	C. M-2019 SHEET 3 REV. 0	JSB2 26SEP03
	D. M-2019 SHEET 4 REV. 0	JSB2 26SEP03
	E. M-2019 SHEET 5 REV. 0	JSB2 26SEP03
	F. M-2019 SHEET 6 REV. 0	JSB2 26SEP03
9.	OTHER DRAWINGS:	JSB2 26SEP03
	A. M-2-B31-1 SHEET 1	JSB2 26SEP03
	B. M-2-B31-1 SHEET 2	JSB2 26SEP03
	C. M-190 REV. 2	JSB2 26SEP03
	D. S-256 REV. 6	JSB2 26SEP03
	E. S-258 REV. 4	JSB2 26SEP03
	F. M-1-R-12 REV. 6 SHEETS 1 & 2	JSB2 26SEP03

*** ACTION REQUEST *** PAGE: 09

A/R TYPE : EC ECR
REQUEST ORG : SMS
REQUEST DATE: 22SEP03
REQUESTED BY: WRIGHT, RM

A/R NUMBER : A1435406
A/R STATUS : ASIGND
STATUS DATE: 25SEP03
LAST UPDATE: 06OCT03
PRINT DATE : 12FEB04

G. M-1-R-12 SHEET 3 REV. 0	JSB2	26SEP03
H. M-2-B31-1 SHEET 1	JSB2	26SEP03
I. M-2-B31-1 SHEET 1	JSB2	26SEP03
J. M-2-76-D-13 SHEETS 1 & 2	JSB2	26SEP03
10. GRINNELL PIPE HANGER, CATALOG PH-90	JSB2	26SEP03
11. SPEC M-300 REV. 16	JSB2	26SEP03
12. DBD PS-45 REV. 15	JSB2	26SEP03
13. PIPING DESIGN AND ENGINEERING BY ITT GRINNELL, 5TH	JSB2	26SEP03
EDITION	JSB2	26SEP03
.	JSB2	26SEP03
PREPARED BY: J.S. BOYER	JSB2	26SEP03
.	MLK1	26SEP03
IR BY: M. KAZOUN	MLK1	26SEP03
I REVIEWED THE EVAL AND AGREE WITH THE CONCLUSIONS. THE	MLK1	26SEP03
AS-FOUND CONDITIONS OF MAIN STEAM PIPING AND SPRINGS ARE	MLK1	26SEP03
ACCEPTABLE. NO FIELD WORK IS REQUIRED. ECR 03-00525 WAS	MLK1	26SEP03
CREATED TO DOCUMENT THE MS ANALYSIS AND REVISE AFFECTED	MLK1	26SEP03
DOCUMENTS AS REQUIRED. ALSO, BASED ON THIS EVALUATION, NO	MLK1	26SEP03
ADDITIONAL SUPPORT INSPECTION, PER N-491-1, IS REQUIRED.	MLK1	26SEP03
THIS TECH EVAL SHALL BE SENT TO RECORDS MANAGEMENT UNDER	MLK1	26SEP03
DOCTYPE 3015 SINCE IT IS RELATED TO AN ISI SSC.	MLK1	26SEP03
.	MLK1	26SEP03
APPROVED: JORDAN	JAJ1	26SEP03
.	MAC0	28SEP03
THIS EVAL IS ACCEPTABLE. NO ADDITIONAL SCOPE IS REQUIRED.	MAC0	28SEP03
NO SUCCESSIVE EXAMINATIONS ARE REQUIRED. EVAL COMPLETE.	MAC0	28SEP03
.	MAC0	28SEP03

==========END OF ACTION REQUEST==========

Date: September 25, 2003 W.O. # C0206838

To: Dave Branciaroli (Exelon)

From: Philip Gainer (GE)

Subject: Per Exelon engineering, General Electric Visual technicians inspected 28 mainsteam spring can hangers for cold settings only. Here is a summary of the results.

Component ID	Detail Cold Setting	Tolerance Plus 10%	Tolerance Minus 10%	As - Found Setting	Acc / Rej	Tech	Remarks
1DB-H10	8697	9566	7828	7200	Reject	L. Eiler	Calculated per MAG-CG-407
1DB-H12	8571	9428	7713	5200	Reject	L. Eiler	
1DB-H13	3600	3960	3240	2750 Both	Reject	L. Eiler	
1DB-H14	8687	9555	7818	8250	Acceptable	J. Mizak	
1DB-H15	8754	9629	7879	8250	Acceptable	J. Mizak	
1DB-H2	6125	6737	5513	5940	Acceptable	L. Eiler	
1DB-H20	8941	9836	8047	8600	Acceptable	L. Eiler	
1DB-H21	11,758	12,933	10,583	9900	Reject	L. Eiler	
1DB-H1	8887	9776	7999	8250	Acceptable	J. Mizak	
1DB-H22	9000	9900	8100	5700	Reject	L. Eiler	Calculated per MAG-CG-407
1DB-H23	3434	3778	3091	a=2640 b=2950	Reject	L. Eiler	
1DB-H24	8887	9776	7999	8250	Acceptable	J. Mizak	
1DB-H25	1800	1980	1620	4500	Reject	J. Price	
1DB-H31	8751	9627	7876	7900	Acceptable	J. Price	
1DB-H33	9000	9900	8100	7500	Reject	J. Price	
1DB-H35	3253	3579	2928	a=2300 b=2400	Reject	J. Price	
1DB-H11	6434	7077	5790	4050	Reject	L. Eiler	Calculated per MAG-CG-407
1DB-H36	8387	9226	7549	8250	Acceptable	J. Mizak	
1DB-H37	8126	8938	7313	7800	Acceptable	S. Woodyard	

Calc. 1-1 R. 1 App. 2, p. 19

Component ID	Detail Cold Setting	Tolerance Plus 10%	Tolerance Minus 10%	As - Found Setting	Acc / Rej	Tech	Remarks
1DB-H38	2966	3263	2670	2950	Acceptable	S. Woodyard	
1DB -H45	6337	6971	5704	4860	Reject	S. Woodyard	
1DB-H47	3225	3548	2903	2550	Reject	S. Woodyard	
7DB-H74	3975	4373	3578			S. Woodyard	Need Scaffolding
7DB-H75	3710	4081	3339	3150	Reject	S. Woodyard	
7DB-H76	3519	3871	3168	3300	Acceptable	L. Eller	
7DB-H77	5928	6521	5336			L. Eller	Need Scaffolding
7DB-H78	3372	3710	3035	2650	Reject	J. Price	
7DB-H79	3906	4296	3516	3155	Reject	L. Eller	

Calc. 1-1 R1
App. 2 P. 11

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MMM         MMM      EEEEEEEEE       11        0000000        11
 MMM       MMM       EE      E      111      00      00      111
 MM MM MM MM MM      EE              11      00      00       11
 MM  MMM  MM MM      EEEE            11      00      00       11
 MM   M   MM MM      EE              11      00      00       11
 MM       MM MM      EE      E       11      00      00       11
MMMM     MMMM      EEEEEEEEE      1111       0000000       1111
```

VERSION : N2

RELEASED : MAY, 1993

USER MANUAL VERSION : N2

THEORETICAL MANUAL VERSION : 9

VALIDATION MANUAL VERSION : N2

SUPPLEMENTAL MANUAL VERSION : 6

IN CASE OF PROBLEMS WITH ME101, CONTACT THE
PIPE STRESS USER REPRESENTATIVES :

	NAME	LOCATION	EXTENSION
- CHICAGO	- B. MCCALL	CAO	2400
- GAITHERSBURG	- R. LEE	GRO	5549
- HOUSTON	- D. RAVAD	HRO	2234
- NORWALK	- K. MORGAN	LARO	2464
- SAN FRANCISCO	- L. T. NICHOLSON	SFRO	973-9965
PROGRAM SPONSOR	- M. KHLAFALLAH	SF 45/30	768-2261
TECHNICAL SPECIALIST	- M. Y. DONG	SF 45/30	768-8482

* FOR COMPLETE ME101 OUTPUT, SEE PAGE 107 OF APP. I MICROFICHE (JOB 24236, DATED 02/12/94)

Calc. 1-1 R-1
APP-2, P. 18

ME101

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                              I N P U T   C A R D   I M A G E S
INPUT
CARD     1       11        21        31        41         51        61        71      80
 SEQ  .  +       +         +         +         +          +         +         +        +   .  LOAD CASE(S)
  1   .  ***    SPRING COLD SETTTING LOADS USED                                            .
  2   .  RUN                                              LDCASE=WT01(1),                  .
  3   .  ****    WT01(1) AS DESIGNED SPRING SETTINGS                                       .
  4   .  RUN                                              LDCASE=WT02(2),                  .
  5   .  ****    WT02(2) AS FOUND SPRING SETTINGS                                          .
  6   .  RUN                                              LDCASE=THRM01,                   .
  7   .  HED                                              TIT=U3 MAIN STEAM LINES O/C,     .
  8   .                                                   PROJNO=03-00525,                 .
  9   .                                                   PROBNO=1-1,                      .
 10   .                                                   USER=KAZOUN,UNITS=2,             .
 11   .                                                   LOOPTL=24,                       .
 12   .  ******@**@**********@**********@**********@*******@***************************@@  .
 13   .  ******     HSO-171                                                                .
 14   .  ANC    A05                                                                        .
 15   .                                                   COSAZ=1,COSCX=1,                 .
 16   .                                                   DTI=X-7A,                        .
 17   .                                                   SIF=1.08,CLASS=2,                .
 18   .                                                   CODE=B31S73,                     .
 19   .                                                   OD=26,THI=0.950,LBS/FT=284,      .
 20   .                                                   E=26.04E6,EXP=4.12,              .
 21   .                                                   SC=15000,SH=15000,               .
 22   .                                                   DPRESS=1115,PPRESS=1337,         .
 23   .                                                   PRESS=1038,                      .
 24   .         A06                   4-8                 ADDWT=10075,DTI=AO-86A,          .
 25   .         A07                   7-10                SIF=7.4,                         .
 26   .         A10            15-8                L      SEG=3,                           .
 27   .         A15                  5-2.5                DTI=1DB-H1,                      .
 28   .  SPR    A15             1                         AA=1500,FORCE=8887,          *1  .  WT01
 29   .  SPR    A15             1                         AA=1500,FORCE=8250,          *2  .  WT02
 30   .  ******@**@**********@**********@**********@*******@***************************@@  .
 31   .         A20                  30-9.188             DTI=1DB-H2,SEG=4,                .
 32   .  SPR    A20             1                         AA=2160,FORCE=6125,          *1  .  WT01
 33   .  SPR    A20             1                         AA=2160,FORCE=5940,          *2  .  WT02
 34   .         A25                  2-1.313              DTI=1DB-S2A,                     .
 35   .  SNB    A25    1                                                                   .
 36   .         A30                  5-9               L                                   .
 37   .         A35    6-7.375                            DTI=1DB-H3,                      .
 38   .  RAD    A35             1                                                          .
 39   .         A40    13-3.625                           DTI=1DB-H4,SEG=3,                .
 40   .  RAD    A40             1                                                          .
 41   .         A45    37-10                              DTI=1DB-H5,SEG=6,                .
 42   .  RAD    A45             1                                                          .
 43   .         A50    37-11                              DTI=1GB-H6,SEG=6,                .
 44   .  RAD    A50             1                                                          .
 45   .  ******@**@**********@**********@**********@*******@***************************@@  .
 46   .         A55    37-10.75                            DTI=1DB-H7,SEG=6,               .
 47   .  RAD    A55             1                                                          .
 48   .         A60    6-6.75                              DTI=1DB-S7A,                    .
 49   .  SNB    A60                    1                                                   .
 50   .         A65    9-2.25                              L                               .
 51   .         A70                   10-11.688            DTI=1DB-H9,SEG=2,               .
 52   .  RAD    A70             1                                                          .
 53   .         A75                   31-2.063             DTI=1DB-H10,SEG=5,              .
 54   .  SPR    A75             1                         AA=3000,FORCE=8697,          *1  .  WT01
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Calc. 1-1 R.1, App. 2, p 19

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55  .  SPR   A75              1                          AA=3000,FORCE=7200,          *2  .  WT02
56  .       A80                                 24-2.25    DTI=1DB-H11,SEG=4,           .
57  .  SPR   A80              1                          AA=2160,FORCE=6434,          *1  .  WT01
58  .  SPR   A80              1                          AA=2160,FORCE=4050,          *2  .  WT02
59  .       A85                                 12-11.688    DTI=1DB-H12,SEG=2,         .
60  .  SPR   A85              1                          AA=3000,FORCE=8571,          *1  .  WT01
61  .  SPR   A85              1                          AA=3000,FORCE=5200,          *2  .  WT02
62  .                                                                                    .
63  .       A88                                 4-5.313        L                         .
64  .       A90  -4-10.5                                    TEE=WTEE,                  .
65  .       A95  -15-3.813                                   DTI=1DB-H13,SEG=2,        .
66  .  SPR   A95              1                             AA=2400,FORCE=7200,       *1  .  WT01
67  .  SPR   A95              1                          AA=2400,FORCE=5500,          *2  .  WT02
68  .       ASV  -8-5.188                                    SEG=2,                    .
69  .       A97  -4-0                                        DTI=MSV-1,THI=2,OD=48,    .
70  .                                                         ADDWT=80200,             .
71  .       MS1                                 3-7.5         DTI=MS-1,                .
72  .  RAD   MS1              1                                                         .
73  .       S02                                 0-6           DTI=1DB-S102,            .
74  .  SNB   S02                                  1                                   .
75  .  ******@**@**********@**********@**********@*******@*****************************@@
76  .     A97GA1  -7-1        -8-7.75                       DTI=CV-1,OD=36,            .
77  .                                                       ADDWT=44700,               .
78  .       CV1  -2-8.625                                   DTI=CV1-SPR,               .
79  .  SPD   CV1                1                                                       .
80  .     GA1GA2                -20-2.25                L     OD=28,THI=1.25,LBS/FT=389, .
81  .                                                         SEG=3,                   .
82  .       GA4  -35-11                       -1-4        L     SEG=6,                 .
83  .       GA5                51-1                       S     SEG=8,                 .
84  .       GA6                                -3-0             DTI=TRBN NOZZLE,       .
85  .  ANC   GA6   0.17          0.46          0.21                                    .
86  .  ******@**@**********@**********@**********@*******@*****************************@@
87  .  ***          HSO-172                                                           .
88  .  ANC   B05                                                                       .
89  .                                                       OD=26,THI=0.950,LBS/FT=284,.
90  .                                                       COSAZ=1,COSCX=1,           .
91  .                                                       DTI=X-7B,                  .
92  .                                                       SIF=1.08,                  .
93  .       B06                                 4-8         ADDWT=10075,DTI=AO-86B,    .
94  .       B07                                 7-10        SIF=7.4,                   .
95  .       B10                15-8                     L     SEG=3,                   .
96  .       B15                                5-2.688       DTI=1DB-H14,             .
97  .  SPR   B15                1                          AA=1500,FORCE=8887,          *1  .  WT01
98  .  SPR   B15                1                          AA=1500,FORCE=8250,          *2  .  WT02
99  .       B20                                31-3.063      DTI=1DB-H15,SEG=4,       .
100 .  SPR   B20                1                          AA=3000,FORCE=8754,          *1  .  WT01
101 .  SPR   B20                1                          AA=3000,FORCE=8250,          *2  .  WT02
102 .       B25                                6-2.25        DTI=1DB-S15A,            .
103 .  SNB   B25   1                                                                   .
104 .       B30                                5-0       L                           .
105 .       B35  9-.438                                     DTI=1DB-H26,SEG=2,         .
106 .  RAD   B35                1                                                     .
107 .       B40  13-10.125                                  DTI=1DB-H16,SEG=2,         .
108 .  RAD   B40                1                                                     .
109 .       B45  35-10.875                                  DTI=1DB-H17,SEG=6,         .
110 .  RAD   B45                1                                                     .
111 .       B50  37-10.875                                  DTI=1GB-H18,SEG=6,         .
112 .  RAD   B50                1                                                     .
113 .  ******@**@**********@**********@**********@*******@*****************************@@
114 .       B55  37-10.813                                  DTI=1DB-H19,SEG=6,         .
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Calc. 1-1 R-1
App. 2. P. 20

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 .  RAD   B55              1                                                                    .
 .        B60  12-10.625                                  DTI=1DB-S7A,                          .
 .  SNB   B60                          1                                                        .
 .        B65  5-2.25                              L                                            .
 .        B70                          7-7.875              DTI=1DB-H20,                        .
 .  SPR   B70              1                              AA=3000,FORCE=8941,          *1   .  WT01
 .  SPR   B70              1                              AA=3000,FORCE=8600,          *2   .  WT02
 .        B75                          30-8.25                 DTI=1DB-H21,SEG=5,               .
 .  SPR   B75              1                              AA=4000,FORCE=11758,         *1   .  WT01
 .  SPR   B75              1                              AA=4000,FORCE=9900,          *2   .  WT02
 .        B80                          30-7.938                DTI=1DB-H22,SEG=4,               .
 .  SPR   B80              1                              AA=3000,FORCE=9000,          *1   .  WT01
 .  SPR   B80              1                              AA=3000,FORCE=5700,          *2   .  WT02
 .        B85                          4-4.938             L                                    .
 .        B90  -4-10.5                                     TEE=WTEE,                            .
 .        B95  -11-3.75                                    DTI=1DB-H23,SEG=2,                   .
 .  SPR   B95              1                              AA=2400,FORCE=6868,          *1   .  WT01
 .  SPR   B95              1                              AA=2400,FORCE=5590,          *2   .  WT02
 .        BSV  -8-5.25                                      SEG=2,                              .
 .        B97  -4-0                                         DTI=MSV-2,THI=2,OD=48,              .
 .                                                           ADDWT=80200,                       .
 .  ******@**@**********@**********@**********@*******@****************************@@          .
 .        GB1  -7-1        -8-7.75                          DTI=CV-2,OD=36,                     .
 .                                                          ADDWT=44700,                        .
 .        CV2  -2-8.625                                     DTI=CV2-SPR,                        .
 .  SPD   CV2               1                                                                   .
 .     GB1GB2              -20-2.25                L        OD=28,THI=1.25,LBS/FT=389,          .
 .                                                          SEG=3,                              .
 .        GB4  -35-11                   -1-3       L        SEG=6,                              .
 .        GB5              39-2                             DTI=TRBN NOZZLE,SEG=8,              .
 .  ANC   GB5   0.17        -0.03        0.08                                                    .
 .  ******@**@**********@**********@**********@*******@****************************@@          .
 .  ***        HSO-173                                                                          .
 .  ANC   C05                                                                                   .
 .                                                        OD=26,THI=0.950,LBS/FT=284,           .
 .                                                        COSAZ=1,COSCX=1,                      .
 .                                                        DTI=X-7D, X-7C                        .
 .                                                        SIF=1.08,                             .
 .        C06                          4-8                ADDWT=10075,DTI=AO-86C,               .
 .        C07                          7-10               SIF=7.4,                              .
 .        C10             15-8                    L       SEG=3,                                .
 .        C15                         5-2.563             DTI=1DB-H24,                          .
 .  SPR   C15              1                              AA=1500,FORCE=8887,          *1   .  WT01
 .  SPR   C15              1                              AA=1500,FORCE=8250,          *2   .  WT02
 .        C20                         30-9.125            DTI=1DB-H25,SEG=5,                    .
 .  SPR   C20              1                              AA=3200,FORCE=9600,          *1   .  WT01
 .  SPR   C20              1                              AA=3200,FORCE=9000,          *2   .  WT02
 .        C25                         11-7.313            DTI=1DB-S25A,                         .
 .  SNB   C25   1                                                                               .
 .        C30                         3-11        L                                             .
 .        C35  8-7.125                                    DTI=1DB-H27,                          .
 .  RAD   C35              1                                                                    .
 .        C40  26-.063                                    DTI=1DB-H28,SEG=4,                    .
 .  RAD   C40              1                                                                    .
 .        C45  37-10.063                                  DTI=1DB-H29,SEG=6,                    .
 .  RAD   C45              1                                                                    .
 .        C50  37-10.875                                   DTI=1GB-H30,SEG=6,                   .
 .  RAD   C50              1                                                                    .
 .  ******@**@**********@**********@**********@*******@****************************@@          .
 .        C55  33-10.625                                   DTI=1DB-S42A,SEG=6,                  .
```

Calc. 1-1 R.1, App. 2, p. 21

```
 .  SNB   C55                          1
 .        C60   4-.563                                          DTI=1DB-H31,                              .
 .  SPR   C60              1                                   AA=3000,FORCE=8751,         *1  .  WT01
 .  SPR   C60              1                                   AA=3000,FORCE=7900,         *2  .  WT02
 .        C65   7-8.688                              L                                             .
 .        C70                          10-8.813                 DTI=1DB-H32,SEG=2,                 .
 .  SPR   C70              1                                   AA=2160,FORCE=6480,         *1  .  WT01
 .  SPR   C70              1                                   AA=2160,FORCE=5750,         *2  .  WT02
 .        C75                          23-8.188                 DTI=1DB-H33,SEG=4,                 .
 .  SPR   C75              1                                   AA=3000,FORCE=9000,         *1  .  WT01
 .  SPR   C75              1                                   AA=3000,FORCE=7500,         *2  .  WT02
 .        C80                          24-2                     DTI=1DB-H34,SEG=4,                 .
 .  SPR   C80              1                                   AA=2160,FORCE=6480,         *1  .  WT01
 .  SPR   C80              1                                   AA=2160,FORCE=4500,         *2  .  WT02
 .        C85                          4-6           L                                             .
 .        C90   -4-10.5                                        TEE=WTEE,                           .
 .        C95   -7-4.563                                        DTI=1DB-H35,                       .
 .  SPR   C95              1                                   AA=2400,FORCE=6506,         *1  .  WT01
 .  SPR   C95              1                                   AA=2400,FORCE=4700,         *2  .  WT02
 .        C96   -7-6                                            DTI=4" CONN,                       .
 .        CSV   -1-3                                                                               .
 .        C97   -4-0                                            DTI=MSV-3,THI=2,OD=48,             .
 .                                                               ADDWT=80200,                      .
 .  ******@**@**********@**********@**********@*******@**************************@@              .
 .        GC1   -7-1       -8-7.75                              DTI=CV-3,OD=36,                    .
 .                                                              ADDWT=44700,                       .
 .        CV3   -2-8.625                                        DTI=CV3-SPR,                       .
 .  SPD   CV3               1                                                                      .
 .     GC1GC2              -20-2.25                  L          OD=28,THI=1.25,LBS/FT=389,         .
 .                                                              SEG=3,                             .
 .        GC4   -35-11                  1-3          L          SEG=6,                             .
 .        GC5               39-2                                DTI=TRBN NOZZLE,SEG=8,             .
 .  ANC   GC5     0.17      -0.03       -0.08                                                      .
 .  ******@**@**********@**********@**********@*******@**************************@@              .
 .  ***         HSO-174                                                                            .
 .  ANC   D05                                                                                      .
 .                                                            OD=26,THI=0.950,LBS/FT=284,          .
 .                                                            COSAZ=1,COSCX=1,                     .
 .                                                            DTI=X-7C, X-7D                       .
 .                                                            SIF=1.08,                            .
 .        D06                          4-8                    ADDWT=10075,DTI=AO-86D,              .
 .        D07                          7-10                   SIF=7.4,                             .
 .        D10               15-8                     L        SEG=3,                               .
 .        D15                         5-2.563                 DTI=1DB-H36,                         .
 .  SPR   D15              1                                  AA=1500,FORCE=8887,          *1  .  WT01
 .  SPR   D15              1                                  AA=1500,FORCE=8250,          *2  .  WT02
 .        D20                         30-9.125                 DTI=1DB-H37,SEG=4,                  .
 .  SPR   D20              1                                  AA=3000,FORCE=8126,          *1  .  WT01
 .  SPR   D20              1                                  AA=3000,FORCE=7800,          *2  .  WT02
 .        D22                         15-4.125                DTI=1DB-H38,SEG=2,                   .
 .  SPR   D22              1                                  AA=2400,FORCE=5932,          *1  .  WT01
 .  SPR   D22              1                                  AA=2400,FORCE=5900,          *2  .  WT02
 .        D25                         0-1.188                  DTI=1DB-S38A,                       .
 .  SNB   D25    1                                                                                 .
 .        D30                         3-11           L                                             .
 .        D33   11-7.75                                       DTI=6" CONN,SEG=2,                   .
 .        D35   4-11.5                                        DTI=1DB-H39,                         .
 .  RAD   D35              1                                                                       .
 .        D40   25-2.125                                       DTI=1DB-H40,SEG=4,                  .
 .  RAD   D40              1                                                                       .
```

Calc. 1-1 R.1
Att. 2, p. 22

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235  .        D45  37-11.813                                  DTI=1DB-H41,SEG=6,                .
236  .  RAD   D45               1                                                              .
237  .        D50  37-10.938                                   DTI=1GB-H42,SEG=6,               .
238  .  RAD   D50               1                                                              .
239  .  ******@**@***********@**********@**********@*******@***************************@@       .
240  .        D55  33-10.5                                     DTI=1DB-S42A,SEG=6,              .
241  .  SNB   D55                          1                                                   .
242  .        D60  4-.438                                      DTI=1DB-H43,                     .
243  .  SPR   D60               1                              AA=3000,FORCE=7681,        *1    .  WT01
244  .  SPR   D60               1                              AA=3000,FORCE=6750,        *2    .  WT02
245  .        D65  3-8.813                           L                                         .
246  .        D70                         7-6                  DTI=1DB-H44,SEG=2,               .
247  .  SPR   D70               1                              AA=2160,FORCE=5148,        *1    .  WT01
248  .  SPR   D70               1                              AA=2160,FORCE=4300,        *2    .  WT02
249  .        D75                         20-8.938               DTI=1DB-H45,SEG=4,             .
250  .  SPR   D75               1                              AA=2160,FORCE=6337,        *1    .  WT01
251  .  SPR   D75               1                              AA=2160,FORCE=4860,        *2    .  WT02
252  .        D80                         18-4.813               DTI=1DB-H46,SEG=3,             .
253  .  SPR   D80               1                               AA=1600,FORCE=4237,       *1    .  WT01
254  .  SPR   D80               1                               AA=1600,FORCE=3000,       *2    .  WT02
255  .        D85                         6-1.25             L                                 .
256  .        D90  -4-10.5                                     TEE=WTEE,                        .
257  .        D95  -3-4.313                                      DTI=1DB-H47,                   .
258  .  SPR   D95               1                              AA=2400,FORCE=6450,        *1    .  WT01
259  .  SPR   D95               1                              AA=2400,FORCE=5100,        *2    .  WT02
260  .        D96  -7-4.688                                    DTI=CONN,                        .
261  .        DSV  -1-0                                                                        .
262  .        D97  -4-0                                        DTI=MSV-4,THI=2,OD=48,           .
263  .                                                           ADDWT=80200,                   .
264  .        MS4                          -3-7.5                  DTI=MS-4,                     .
265  .  RAD   MS4               1                                                              .
266  .  ******@**@***********@**********@**********@*******@***************************@@       .
267  .     D97GD1  -7-1         -8-7.75                            DTI=CV-4,OD=36,                .
268  .                                                             ADDWT=44700,                   .
269  .        CV4  -2-8.625                                        DTI=CV4-SPR,                   .
270  .  SPD   CV4                1                                                             .
271  .     GD1GD2               -20-2.25              L            OD=28,THI=1.25,LBS/FT=389,     .
272  .                                                             SEG=3,                         .
273  .        GD4  -35-11                  1-4        L            SEG=6,                         .
274  .        GD5               51-1                  S            SEG=8,                         .
275  .        GD6                          3-0                     DTI=TRBN NOZZLE,               .
276  .  ANC   GD6   0.17         0.46      -0.21                                                 .
277  .  ******@**@***********@**********@**********@*******@***************************@@       .
278  .  ***        HSO-760                                                                      .
279  .     A90105             2-7                    L          OD=14,THI=.75,                   .
280  .                                                          LBS/FT=124,                      .
281  .        110  -8-7.5                                       SEG=2,DTI=7DB-H79,               .
282  .  SPR   110               1                               AA=1600,FORCE=3906,        *1    .  WT01
283  .  SPR   110               1                               AA=1600,FORCE=3155,        *2    .  WT02
284  .        115  -10-5.75                                     SEG=2,TEE=WTEE,                  .
285  .        120                          16-3                 DTI=7DB-H77,SEG=3,               .
286  .                                                          OD=18,THI=0.937,                 .
287  .                                                          LBS/FT=193,                      .
288  .  SPR   120               1                               AA=2160,FORCE=5928,        *1    .  WT01
289  .  SPR   120               1                               AA=2160,FORCE=5928,        *2    .  WT02
290  .        125                          20-6                 DTI=7DB-H76,SEG=4,SIF=6,         .
291  .  SPR   125               1                               AA=1200,FORCE=3519,        *1    .  WT01
292  .  SPR   125               1                               AA=1200,FORCE=3300,        *2    .  WT02
293  .        130                          5-4        L                                         .
294  .        133  -4-6                               S                                         .
```

Calc. 1-1 R.1
App 2, p.23

```
.        135                 -1-7          DTI=7DB-S11,                .
. SNB    135 -.707           0.707                                     .
.        140                 -0-2          DTI=7DB-S12,                .
. SNB    140  0.707          0.707                                     .
.        144                 -0-9                                      .
.        145                 -2-5          DTI=BYPS VV SPPT,           .
.                                          LBS/FT=3621,                .
. RAD    145          1                                                .
.        146                 -10-6         DTI=BYPS VV SPPT,           .
. RAD    146          1                                                .
.        147                 -2-5                                      .
. ******@**@**********@**********@**********@*******@***************************@@ .
.        150                 -0-2          DTI=7DB-S10,LBS/FT=193,     .
. SNB    150  0.956    0.292                                           .
.        155                 -0-9       S                              .
.        160  3-0      2-1   -3-8       L                              .
.        165                 -3-8          DTI=7DB-H74,                .
. SPR    165          1                    AA=1600,FORCE=3975,     *1  .  WT01
. SPR    165          1                    AA=1600,FORCE=3975,     *2  .  WT02
.        170                 -22-9         TEE=WTEE,SEG=4,             .
.        175                 -2-0          JOINT=RED,                  .
.        180                 -5-8          DTI=7DB-H75,                .
.                                          OD=14,THI=.75,              .
.                                          LBS/FT=124,                 .
. SPR    180          1                    AA=1600,FORCE=3710,     *1  .  WT01
. SPR    180          1                    AA=1600,FORCE=3150,     *2  .  WT02
.        230                 -5-4       L                              .
.        235  8-7.75                    L   SEG=2,                     .
.        D90           -4-6                DTI=26"MS D,                .
.     115240                 -2-0          JOINT=RED,                  .
.                                          OD=18,THI=0.937,            .
.                                          LBS/FT=193,                 .
.        245                 -11-0      L  OD=14,THI=.75,              .
.                                          LBS/FT=124,SEG=2,           .
.        250  3-8                          DTI=7DB-H78,                .
. SPR    250          1                    AA=1200,FORCE=3372,     *1  .  WT01
. SPR    250          1                    AA=1200,FORCE=2650,     *2  .  WT02
.        255  7-5.75                    L                              .
.        C90           -2-7                                            .
.     170260 16-7.75                    L   SEG=3,                     .
.        B90            -4-6                                           .
. ******@**@**********@**********@**********@*******@***************************@@ .
.     B97S01                 3-3            DTI=1DB-S101,              .
.                                           OD=48,THI=2,LBS/FT=0,      .
. SNB    S01   0.932   -0.363                                          .
.        A97                 3-3                                       .
.     C97MS2                 3-3            DTI=MS2-MS3 SPR,           .
. SPD    MS2           1                                               .
.        B97                 3-3                                       .
.     D97S00                 3-3            DTI=1DB-S100,              .
. SNB    S00  0.932   -0.363                                           .
.        C97                 3-3                                       .
. *****************************************************************    .
.     A07AR5           -3-0               DTI=REST-5,OD=20,THI=1,      .
.                                         LBS/FT=209,                  .
. RAD    AR5          1                                                .
.     B07BR5           -3-0               DTI=REST-5,                  .
. RAD    BR5          1                                                .
.     C07CR5           -3-0               DTI=REST-5,                  .
. RAD    CR5          1                                                .
```

Calc. 1-1 R.1
App. 2, p.24

```
355  .    D07DR5             -3-0                    DTI=REST-5,                   .
356  .  RAD   DR5             1                                                    .
357  .  ********************************************************************       .
358  .  SLA                                             INCLUD=WT02,               .
359  .  TEA                                             INCLUD=WT02,               .
360  .  RLS                                             LIST=WT01+WT02+THRM01,     .
361  .  END                                                                        .
     .  +       +       +       +       +       +       +       +       +        .
```

```
              361 CARDS IN INPUT DECK
              328 CARDS IN LOAD CASE WT01
              328 CARDS IN LOAD CASE WT02
              295 CARDS IN LOAD CASE THRM01

                0 WARNINGS
                0 ERRORS
                0 FATAL ERRORS
ME101DK     Version N2     stop  on 09/26/03 at 02:24:22
ME101DK     Version N2     run time      .67 seconds
ME101I      Version N2     start on 09/26/03 at 02:24:23
```

Calc. 1-1 R. 1
App. 2, P. 25

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1 Rev. 1
USER : KAZOUN
LOAD CASE : WT01

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A05	TNGT	3	-10243	6	-420	-377	-27806	713.	1.080	1.000	1.000	B31S73
A06		-3	8918	-6	420	347	-16904	433.	1.000	1.000	1.000	
A06	TNGT	3	1157	6	-420	-347	16904	433.	1.000	1.000	1.000	B31S73
A07		-3	-3381	-6	420	297	868	144.	7.400	1.000	1.000	
A07	TNGT	1352	3	6	297	-420	-868	144.	7.400	1.000	1.000	B31S73
A07A		-177	-3	-6	-297	393	881	26.	1.000	1.000	1.000	
A07A	TNGT	177	3	6	297	-393	-881	26.	1.000	1.000	1.000	B31S73
A07B		998	-3	-6	-297	367	894	26.	1.000	1.000	1.000	
A07B	TNGT	-998	3	6	297	-367	-894	26.	1.000	1.000	1.000	B31S73
A10 B		2173	-3	-6	-297	340	907	26.	1.000	1.000	1.000	
A10 B	BEND	-2173	3	6	297	-340	-907	46.	2.356	6.986	6.986	B31S73
A10 M		2047	-2051	-6	25	436	3438	157.	2.356	6.986	6.986	
A10 M	BEND	-2047	2051	6	-25	-436	-3438	157.	2.356	6.986	6.986	B31S73
A10 E		-3	-3623	-6	319	276	10980	498.	2.356	6.986	6.986	
A10 E	TNGT	3	3623	6	-319	-276	-10980	282.	1.000	1.000	1.000	B31S73
A15		-3	-4179	-6	319	264	18619	477.	1.000	1.000	1.000	
A15	TNGT	3	-4713	6	-319	-264	-18619	477.	1.000	1.000	1.000	B31S73
A15A		-3	2529	-6	319	214	-9234	237.	1.000	1.000	1.000	
A15A	TNGT	3	-2529	6	-319	-214	9234	237.	1.000	1.000	1.000	B31S73
A15B		-3	346	-6	319	165	-20291	520.	1.000	1.000	1.000	
A15B	TNGT	3	-346	6	-319	-165	20291	520.	1.000	1.000	1.000	B31S73
A15C		-3	-1838	-6	319	116	-14553	373.	1.000	1.000	1.000	
A15C	TNGT	3	1838	6	-319	-116	14553	373.	1.000	1.000	1.000	B31S73
A20		-3	-4022	-6	319	66	7981	205.	1.000	1.000	1.000	
A20	TNGT	3	-2133	6	-319	-66	-7981	205.	1.000	1.000	1.000	B31S73
A25		-3	1534	-6	319	53	4113	106.	1.000	1.000	1.000	
A25	TNGT	3	-1534	6	-319	-53	-4113	106.	1.000	1.000	1.000	B31S73
A30 B		-3	825	-6	319	37	1165	31.	1.000	1.000	1.000	
A30 B	BEND	3	6	825	-319	-1165	37	55.	2.356	6.986	6.986	B31S73
A30 M		-7	-2	-100	499	-419	-25	30.	2.356	6.986	6.986	

Calc - 1-1 Rev. 1
App. 2 Page 26

ELEMENT FROM / TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI) .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A30 M	BEND	7	2	100	-499	419	25	30.	2.356	6.986	6.986	B31S73
A30 E		-6	3	625	197	0	-26	9.	2.356	6.986	6.986	
A30 E	TNGT	6	-625	3	-197	26	0	5.	1.000	1.000	1.000	B31S73
A35		-6	1580	-3	197	-37	-3709	95.	1.000	1.000	1.000	
A35	TNGT	6	285	3	-197	37	3709	95.	1.000	1.000	1.000	B31S73
A35A		-6	974	-3	197	-51	-5237	134.	1.000	1.000	1.000	
A35A	TNGT	6	-974	3	-197	51	5237	134.	1.000	1.000	1.000	B31S73
A35B		-6	2233	-3	197	-65	-12347	317.	1.000	1.000	1.000	
A35B	TNGT	6	-2233	3	-197	65	12347	317.	1.000	1.000	1.000	B31S73
A40		-6	3492	-3	197	-78	-25039	642.	1.000	1.000	1.000	
A40	TNGT	6	5069	3	-197	78	25039	642.	1.000	1.000	1.000	B31S73
A40A		-6	-3279	-3	197	-98	1283	33.	1.000	1.000	1.000	
A40A	TNGT	6	3279	3	-197	98	-1283	33.	1.000	1.000	1.000	B31S73
A40B		-6	-1489	-3	197	-118	16315	418.	1.000	1.000	1.000	
A40B	TNGT	6	1489	3	-197	118	-16315	418.	1.000	1.000	1.000	B31S73
A40C		-6	301	-3	197	-138	20060	514.	1.000	1.000	1.000	
A40C	TNGT	6	-301	3	-197	138	-20060	514.	1.000	1.000	1.000	B31S73
A40D		-6	2091	-3	197	-157	12516	321.	1.000	1.000	1.000	
A40D	TNGT	6	-2091	3	-197	157	-12516	321.	1.000	1.000	1.000	B31S73
A40E		-6	3882	-3	197	-177	-6315	162.	1.000	1.000	1.000	
A40E	TNGT	6	-3882	3	-197	177	6315	162.	1.000	1.000	1.000	B31S73
A45		-6	5672	-3	197	-197	-36436	934.	1.000	1.000	1.000	
A45	TNGT	6	5482	3	-197	197	36436	934.	1.000	1.000	1.000	B31S73
A45A		-6	-3688	-3	197	-217	-7463	191.	1.000	1.000	1.000	
A45A	TNGT	6	3688	3	-197	217	7463	191.	1.000	1.000	1.000	B31S73
A45B		-6	-1894	-3	197	-236	10173	261.	1.000	1.000	1.000	
A45B	TNGT	6	1894	3	-197	236	-10173	261.	1.000	1.000	1.000	B31S73
A45C		-6	-99	-3	197	-256	16470	422.	1.000	1.000	1.000	
A45C	TNGT	6	99	3	-197	256	-16470	422.	1.000	1.000	1.000	B31S73
A45D		-6	1695	-3	197	-276	11428	293.	1.000	1.000	1.000	
A45D	TNGT	6	-1695	3	-197	276	-11428	293.	1.000	1.000	1.000	B31S73
A45E		-6	3489	-3	197	-296	-4951	127.	1.000	1.000	1.000	
A45E	TNGT	6	-3489	3	-197	296	4951	127.	1.000	1.000	1.000	B31S73
A50		-6	5283	-3	197	-316	-32668	837.	1.000	1.000	1.000	

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A50	TNGT	6	5266	3	-197	316	32668	837.	1.000	1.000	1.000	B31S73
A50A		-6	-3473	-3	197	-335	-5069	130.	1.000	1.000	1.000	
A50A	TNGT	6	3473	3	-197	335	5069	130.	1.000	1.000	1.000	B31S73
A50B		-6	-1680	-3	197	-355	11203	287.	1.000	1.000	1.000	
A50B	TNGT	6	1680	3	-197	355	-11203	287.	1.000	1.000	1.000	B31S73
A50C		-6	113	-3	197	-375	16151	414.	1.000	1.000	1.000	
A50C	TNGT	6	-113	3	-197	375	-16151	414.	1.000	1.000	1.000	B31S73
A50D		-6	1906	-3	197	-395	9772	251.	1.000	1.000	1.000	
A50D	TNGT	6	-1906	3	-197	395	-9772	251.	1.000	1.000	1.000	B31S73
A50E		-6	3700	-3	197	-414	-7931	204.	1.000	1.000	1.000	
A50E	TNGT	6	-3700	3	-197	414	7931	204.	1.000	1.000	1.000	B31S73
A55		-6	5493	-3	197	-434	-36961	947.	1.000	1.000	1.000	
A55	TNGT	6	5324	3	-197	434	36961	947.	1.000	1.000	1.000	B31S73
A60		-6	-3461	-3	197	-455	-8136	209.	1.000	1.000	1.000	
A60	TNGT	6	3461	3	-197	455	8136	209.	1.000	1.000	1.000	B31S73
A65 B		-6	-1775	-3	197	-473	7407	190.	1.000	1.000	1.000	
A65 B	BEND	6	3	-1775	-197	-7407	-473	336.	2.356	6.986	6.986	B31S73
A65 M		-7	2	1050	6832	8299	474	487.	2.356	6.986	6.986	
A65 M	BEND	7	-2	-1050	-6832	-8299	-474	487.	2.356	6.986	6.986	B31S73
A65 E		-3	6	326	11464	2573	463	532.	2.356	6.986	6.986	
A65 E	TNGT	3	-326	6	-11464	-463	2573	301.	1.000	1.000	1.000	B31S73
A65A		-3	-771	-6	11464	438	-1714	297.	1.000	1.000	1.000	
A65A	TNGT	3	771	6	-11464	-438	1714	297.	1.000	1.000	1.000	B31S73
A70		-3	-1867	-6	11464	413	3381	307.	1.000	1.000	1.000	
A70	TNGT	3	-3866	6	-11464	-413	-3381	307.	1.000	1.000	1.000	B31S73
A70A		-3	2096	-6	11464	373	-15203	488.	1.000	1.000	1.000	
A70A	TNGT	3	-2096	6	-11464	-373	15203	488.	1.000	1.000	1.000	B31S73
A70B		-3	326	-6	11464	333	-22752	653.	1.000	1.000	1.000	
A70B	TNGT	3	-326	6	-11464	-333	22752	653.	1.000	1.000	1.000	B31S73
A70C		-3	-1444	-6	11464	293	-19266	575.	1.000	1.000	1.000	
A70C	TNGT	3	1444	6	-11464	-293	19266	575.	1.000	1.000	1.000	B31S73
A70D		-3	-3214	-6	11464	253	-4746	318.	1.000	1.000	1.000	
A70D	TNGT	3	3214	6	-11464	-253	4746	318.	1.000	1.000	1.000	B31S73
A75		-3	-4984	-6	11464	213	20810	609.	1.000	1.000	1.000	

App. 2, p. 23

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A75	TNGT	3	-3256	6	-11464	-213	-20810	609.	1.000	1.000	1.000	B31S73
A75A		-3	1539	-6	11464	175	6315	335.	1.000	1.000	1.000	
A75A	TNGT	3	-1539	6	-11464	-175	-6315	335.	1.000	1.000	1.000	B31S73
A75B		-3	-178	-6	11464	136	2201	299.	1.000	1.000	1.000	
A75B	TNGT	3	178	6	-11464	-136	-2201	299.	1.000	1.000	1.000	B31S73
A75C		-3	-1895	-6	11464	97	8467	365.	1.000	1.000	1.000	
A75C	TNGT	3	1895	6	-11464	-97	-8467	365.	1.000	1.000	1.000	B31S73
A80		-3	-3612	-6	11464	58	25116	708.	1.000	1.000	1.000	
A80	TNGT	3	-2225	6	-11464	-58	-25116	708.	1.000	1.000	1.000	B31S73
A80A		-3	383	-6	11464	17	16656	518.	1.000	1.000	1.000	
A80A	TNGT	3	-383	6	-11464	-17	-16656	518.	1.000	1.000	1.000	B31S73
A85		-3	-1459	-6	11464	-25	20145	594.	1.000	1.000	1.000	
A85	TNGT	3	-6191	6	-11464	25	-20145	594.	1.000	1.000	1.000	B31S73
A88 B		-3	5853	-6	11464	-32	12962	444.	1.000	1.000	1.000	
A88 B	BEND	3	-6	-5853	-11464	12962	32	784.	2.356	6.986	6.986	B31S73
A88 M		2	7	5128	4277	-4701	-50	288.	2.356	6.986	6.986	
A88 M	BEND	-2	-7	-5128	-4277	4701	50	288.	2.356	6.986	6.986	B31S73
A88 E		6	3	4403	4347	4557	-63	285.	2.356	6.986	6.986	
A88 E	TNGT	-6	-4403	3	-4347	63	4557	161.	1.000	1.000	1.000	B31S73
A90		6	3942	-3	4347	-68	-11338	437.	1.871	1.000	1.000	
A90	TNGT	-144	-4660	113	-3226	-589	7421	292.	1.871	1.000	1.000	B31S73
A90A		144	2486	-113	3226	-278	-34787	895.	1.000	1.000	1.000	
A90A	TNGT	-144	-2486	113	-3226	278	34787	895.	1.000	1.000	1.000	B31S73
A95		144	311	-113	3226	-1146	-45498	1169.	1.000	1.000	1.000	
A95	TNGT	-144	-7390	113	-3226	1146	45498	1169.	1.000	1.000	1.000	B31S73
A95A		144	6193	-113	3226	-1624	-74131	1902.	1.000	1.000	1.000	
A95A	TNGT	-144	-6193	113	-3226	1624	74131	1902.	1.000	1.000	1.000	B31S73
ASV		144	4996	-113	3226	-2102	-97716	2506.	1.000	1.000	1.000	
ASV	TNGT	-144	-4996	113	-3226	2102	97716	353.	1.000	1.000	1.000	B31S73
A97		144	3859	-113	3226	-2555	-115426	417.	1.000	1.000	1.000	
A97	TNGT	0	60962	0	0	0	222817	804.	1.000	1.000	1.000	B31S73
MS1		0	-61992	0	0	0	36	0.	1.000	1.000	1.000	
MS1	TNGT	0	-142	0	0	0	-36	0.	1.000	1.000	1.000	B31S73
S02		0	0	0	0	0	0	0.	1.000	1.000	1.000	

Calc. 1-1 Rev. 2, Page 159

ELEMENT FROM / TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI) .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A97	TNGT	-6698	-5301	241	-1227	-9040	81758	544.	1.000	1.000	1.000	B31S73
GA1		4240	3287	-241	1227	6345	-129755	859.	1.000	1.000	1.000	
GA1	TNGT	0	53880	0	0	0	147538	975.	1.000	1.000	1.000	B31S73
CV1		0	-54653	0	0	0	0	0.	1.000	1.000	1.000	
GA1	TNGT	-14544	-241	144	-4970	17783	-4131	323.	1.000	1.000	1.000	B31S73
GA1A		12379	241	-144	4970	-18586	2789	332.	1.000	1.000	1.000	
GA1A	TNGT	-12379	-241	144	-4970	18586	-2789	332.	1.000	1.000	1.000	B31S73
GA1B		10214	241	-144	4970	-19390	1448	343.	1.000	1.000	1.000	
GA1B	TNGT	-10214	-241	144	-4970	19390	-1448	343.	1.000	1.000	1.000	B31S73
GA2 B		8049	241	-144	4970	-20193	107	355.	1.000	1.000	1.000	
GA2 B	BEND	-8049	-153	-236	-4970	856	20175	543.	2.038	5.622	5.622	B31S73
GA2 M		5044	-4827	236	3150	-3537	-13026	362.	2.038	5.622	5.622	
GA2 M	BEND	-5044	4827	-236	-3150	3537	13026	362.	2.038	5.622	5.622	B31S73
GA2 E		153	-5910	236	-32	-4146	2693	129.	2.038	5.622	5.622	
GA2 E	TNGT	-153	-5910	236	32	-4146	2693	84.	1.000	1.000	1.000	B31S73
GA2A		153	4032	-236	-32	3009	-26671	458.	1.000	1.000	1.000	
GA2A	TNGT	-153	-4032	236	31	-3009	26671	458.	1.000	1.000	1.000	B31S73
GA2B		153	2155	-236	-31	1873	-41594	711.	1.000	1.000	1.000	
GA2B	TNGT	-153	-2155	236	32	-1873	41594	711.	1.000	1.000	1.000	B31S73
GA2C		153	278	-236	-32	737	-47461	811.	1.000	1.000	1.000	
GA2C	TNGT	-153	-278	236	32	-737	47461	811.	1.000	1.000	1.000	B31S73
GA2D		153	-1600	-236	-32	-400	-44273	756.	1.000	1.000	1.000	
GA2D	TNGT	-153	1600	236	32	400	44273	756.	1.000	1.000	1.000	B31S73
GA2E		153	-3477	-236	-32	-1536	-32030	548.	1.000	1.000	1.000	
GA2E	TNGT	-153	3477	236	32	1536	32030	548.	1.000	1.000	1.000	B31S73
GA4 B		153	-5354	-236	-32	-2672	-10732	189.	1.000	1.000	1.000	
GA4 B	BEND	-153	-5354	-236	32	-2672	-10732	289.	2.038	5.622	5.622	B31S73
GA4 M		4651	4434	236	2109	2495	-3613	127.	2.038	5.622	5.622	
GA4 M	BEND	-4651	-4434	-236	-2109	-2495	3613	127.	2.038	5.622	5.622	B31S73
GA4 E		7494	-153	236	3497	856	-10192	282.	2.038	5.622	5.622	
GA4 E	TNGT	-7494	241	144	-3497	-10217	-478	185.	1.000	1.000	1.000	B31S73
GA4A		9695	-241	-144	3497	9400	1841	174.	1.000	1.000	1.000	
GA4A	TNGT	-9695	241	144	-3497	-9400	-1841	174.	1.000	1.000	1.000	B31S73
GA4B		11896	-241	-144	3497	8583	3205	168.	1.000	1.000	1.000	

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
GA4B	TNGT	-11896	241	144	-3497	-8583	-3205	168.	1.000	1.000	1.000	B31S73
GA4C		14098	-241	-144	3497	7766	4569	165.	1.000	1.000	1.000	
GA4C	TNGT	-14098	241	144	-3497	-7766	-4569	165.	1.000	1.000	1.000	B31S73
GA4D		16299	-241	-144	3497	6949	5932	167.	1.000	1.000	1.000	
GA4D	TNGT	-16299	241	144	-3497	-6949	-5932	167.	1.000	1.000	1.000	B31S73
GA4E		18501	-241	-144	3497	6132	7296	173.	1.000	1.000	1.000	
GA4E	TNGT	-18501	241	144	-3497	-6132	-7296	173.	1.000	1.000	1.000	B31S73
GA4F		20702	-241	-144	3497	5315	8660	184.	1.000	1.000	1.000	
GA4F	TNGT	-20702	241	144	-3497	-5315	-8660	184.	1.000	1.000	1.000	B31S73
GA4G		22903	-241	-144	3497	4497	10023	197.	1.000	1.000	1.000	
GA4G	TNGT	-22903	241	144	-3497	-4497	-10023	197.	1.000	1.000	1.000	B31S73
GA5 B		25105	-241	-144	3497	3680	11387	213.	1.000	1.000	1.000	
GA5 B	BEND	-25105	-241	-144	-3497	3680	11387	427.	2.670	8.433	8.433	B31S73
GA5 M		18426	-18085	144	-31	-4837	5694	256.	2.670	8.433	8.433	
GA5 M	BEND	-18426	18085	-144	31	4837	-5694	256.	2.670	8.433	8.433	B31S73
GA5 E		241	-26531	144	-3343	-3160	48747	1675.	2.670	8.433	8.433	
GA5 E	TNGT	-241	-26531	144	3343	-3160	48747	836.	1.000	1.000	1.000	B31S73
GA6		241	26791	-144	-3343	3063	-66521	1139.	1.000	1.000	1.000	
B05	TNGT	5	-10539	12	274	-643	-28884	741.	1.080	1.000	1.000	B31S73
B06		-5	9214	-12	-274	585	-17206	441.	1.000	1.000	1.000	
B06	TNGT	5	861	12	274	-585	17206	441.	1.000	1.000	1.000	B31S73
B07		-5	-3085	-12	-274	488	-1750	261.	7.400	1.000	1.000	
B07	TNGT	885	5	12	488	274	1750	261.	7.400	1.000	1.000	B31S73
B07A		290	-5	-12	-488	-326	-1731	47.	1.000	1.000	1.000	
B07A	TNGT	-290	5	12	488	326	1731	47.	1.000	1.000	1.000	B31S73
B07B		1465	-5	-12	-488	-377	-1711	47.	1.000	1.000	1.000	
B07B	TNGT	-1465	5	12	488	377	1711	47.	1.000	1.000	1.000	B31S73
B10 B		2640	-5	-12	-488	-428	-1691	46.	1.000	1.000	1.000	
B10 B	BEND	-2640	5	12	488	428	1691	82.	2.356	6.986	6.986	B31S73
B10 M		2376	-2383	-12	-660	14	1288	66.	2.356	6.986	6.986	
B10 M	BEND	-2376	2383	12	660	-14	-1288	66.	2.356	6.986	6.986	B31S73
B10 E		-5	-4090	-12	-469	448	9904	449.	2.356	6.986	6.986	
B10 E	TNGT	5	4090	12	469	-448	-9904	254.	1.000	1.000	1.000	B31S73
B15		-5	-4650	-12	-469	423	18530	475.	1.000	1.000	1.000	

Calc. 1-1 Rev. 1
App. 2, p. 161

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
B15	TNGT	5	-4233	12	469	-423	-18530	475.	1.000	1.000	1.000	B31S73
B15A		-5	2014	-12	-469	326	-5875	151.	1.000	1.000	1.000	
B15A	TNGT	5	-2014	12	469	-326	5875	151.	1.000	1.000	1.000	B31S73
B15B		-5	-204	-12	-469	229	-12945	332.	1.000	1.000	1.000	
B15B	TNGT	5	204	12	469	-229	12945	332.	1.000	1.000	1.000	B31S73
B15C		-5	-2423	-12	-469	132	-2682	70.	1.000	1.000	1.000	
B15C	TNGT	5	2423	12	469	-132	2682	70.	1.000	1.000	1.000	B31S73
B20		-5	-4641	-12	-469	35	24917	639.	1.000	1.000	1.000	
B20	TNGT	5	-4091	12	469	-35	-24917	639.	1.000	1.000	1.000	B31S73
B25		-5	2334	-12	-469	-42	5041	130.	1.000	1.000	1.000	
B25	TNGT	5	-2334	12	469	42	-5041	130.	1.000	1.000	1.000	B31S73
B30 B		-5	1837	-12	-469	-64	1391	38.	1.000	1.000	1.000	
B30 B	BEND	5	12	1837	469	-1391	-64	67.	2.356	6.986	6.986	B31S73
B30 M		-12	-5	-1112	-862	-2028	88	100.	2.356	6.986	6.986	
B30 M	BEND	12	5	1112	862	2028	-88	100.	2.356	6.986	6.986	B31S73
B30 E		-12	5	-388	-2867	-2503	89	172.	2.356	6.986	6.986	
B30 E	TNGT	12	388	5	2867	-89	-2503	98.	1.000	1.000	1.000	B31S73
B30A		-12	434	-5	-2867	75	2436	96.	1.000	1.000	1.000	
B30A	TNGT	12	-434	5	2867	-75	-2436	96.	1.000	1.000	1.000	B31S73
B35		-12	1255	-5	-2867	61	-7	74.	1.000	1.000	1.000	
B35	TNGT	12	272	5	2867	-61	7	74.	1.000	1.000	1.000	B31S73
B35A		-12	1693	-5	-2867	28	-4926	146.	1.000	1.000	1.000	
B35A	TNGT	12	-1693	5	2867	-28	4926	146.	1.000	1.000	1.000	B31S73
B40		-12	3659	-5	-2867	-5	-23449	605.	1.000	1.000	1.000	
B40	TNGT	12	4885	5	2867	5	23449	605.	1.000	1.000	1.000	B31S73
B40A		-12	-3186	-5	-2867	-33	700	76.	1.000	1.000	1.000	
B40A	TNGT	12	3186	5	2867	33	-700	76.	1.000	1.000	1.000	B31S73
B40B		-12	-1487	-5	-2867	-62	14682	383.	1.000	1.000	1.000	
B40B	TNGT	12	1487	5	2867	62	-14682	383.	1.000	1.000	1.000	B31S73
B40C		-12	212	-5	-2867	-90	18495	480.	1.000	1.000	1.000	
B40C	TNGT	12	-212	5	2867	90	-18495	480.	1.000	1.000	1.000	B31S73
B40D		-12	1911	-5	-2867	-119	12141	320.	1.000	1.000	1.000	
B40D	TNGT	12	-1911	5	2867	119	-12141	320.	1.000	1.000	1.000	B31S73
B40E		-12	3610	-5	-2867	-147	-4380	134.	1.000	1.000	1.000	

Calc. 1-1 R.1
App. 2, p. 32

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
B40E	TNGT	12	-3610	5	2867	147	4380	134.	1.000	1.000	1.000	B31S73
B45		-12	5309	-5	-2867	-176	-31069	800.	1.000	1.000	1.000	
B45	TNGT	12	4999	5	2867	176	31069	800.	1.000	1.000	1.000	B31S73
B45A		-12	-3206	-5	-2867	-206	-5150	151.	1.000	1.000	1.000	
B45A	TNGT	12	3206	5	2867	206	5150	151.	1.000	1.000	1.000	B31S73
B45B		-12	-1412	-5	-2867	-236	9437	253.	1.000	1.000	1.000	
B45B	TNGT	12	1412	5	2867	236	-9437	253.	1.000	1.000	1.000	B31S73
B45C		-12	382	-5	-2867	-266	12692	334.	1.000	1.000	1.000	
B45C	TNGT	12	-382	5	2867	266	-12692	334.	1.000	1.000	1.000	B31S73
B45D		-12	2175	-5	-2867	-296	4615	139.	1.000	1.000	1.000	
B45D	TNGT	12	-2175	5	2867	296	-4615	139.	1.000	1.000	1.000	B31S73
B45E		-12	3969	-5	-2867	-326	-14793	386.	1.000	1.000	1.000	
B45E	TNGT	12	-3969	5	2867	326	14793	386.	1.000	1.000	1.000	B31S73
B50		-12	5763	-5	-2867	-356	-45533	1169.	1.000	1.000	1.000	
B50	TNGT	12	6848	5	2867	356	45533	1169.	1.000	1.000	1.000	B31S73
B50A		-12	-5054	-5	-2867	-386	-7941	217.	1.000	1.000	1.000	
B50A	TNGT	12	5054	5	2867	386	7941	217.	1.000	1.000	1.000	B31S73
B50B		-12	-3261	-5	-2867	-416	18323	475.	1.000	1.000	1.000	
B50B	TNGT	12	3261	5	2867	416	-18323	475.	1.000	1.000	1.000	B31S73
B50C		-12	-1468	-5	-2867	-446	33258	856.	1.000	1.000	1.000	
B50C	TNGT	12	1468	5	2867	446	-33258	856.	1.000	1.000	1.000	B31S73
B50D		-12	326	-5	-2867	-476	36864	948.	1.000	1.000	1.000	
B50D	TNGT	12	-326	5	2867	476	-36864	948.	1.000	1.000	1.000	B31S73
B50E		-12	2119	-5	-2867	-506	29141	751.	1.000	1.000	1.000	
B50E	TNGT	12	-2119	5	2867	506	-29141	751.	1.000	1.000	1.000	B31S73
B55		-12	3913	-5	-2867	-537	10090	269.	1.000	1.000	1.000	
B55	TNGT	12	2060	5	2867	537	-10090	269.	1.000	1.000	1.000	B31S73
B60		-12	1598	-5	-2867	-598	13065	343.	1.000	1.000	1.000	
B60	TNGT	12	-1598	5	2867	598	-13065	343.	1.000	1.000	1.000	B31S73
B65 B		-12	2148	-5	-2867	-607	9435	253.	1.000	1.000	1.000	
B65 B	BEND	12	5	2148	2867	-9435	-607	447.	2.356	6.986	6.986	B31S73
B65 M		-12	5	-2873	2364	2884	606	171.	2.356	6.986	6.986	
B65 M	BEND	12	-5	2873	-2364	-2884	-606	171.	2.356	6.986	6.986	B31S73
B65 E		-5	12	-3598	741	-7114	582	325.	2.356	6.986	6.986	

Calc. 1-1 R1
App. 2, p. 33

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
B65 E	TNGT	5	3598	12	-741	-582	-7114	184.	1.000	1.000	1.000	B31S73
B70		-5	-4849	-12	741	527	25722	660.	1.000	1.000	1.000	
B70	TNGT	5	-3573	12	-741	-527	-25722	660.	1.000	1.000	1.000	B31S73
B70A		-5	1830	-12	741	451	9141	235.	1.000	1.000	1.000	
B70A	TNGT	5	-1830	12	-741	-451	-9141	235.	1.000	1.000	1.000	B31S73
B70B		-5	88	-12	741	375	3254	86.	1.000	1.000	1.000	
B70B	TNGT	5	-88	12	-741	-375	-3254	86.	1.000	1.000	1.000	B31S73
B70C		-5	-1655	-12	741	299	8061	208.	1.000	1.000	1.000	
B70C	TNGT	5	1655	12	-741	-299	-8061	208.	1.000	1.000	1.000	B31S73
B70D		-5	-3397	-12	741	222	23564	604.	1.000	1.000	1.000	
B70D	TNGT	5	3397	12	-741	-222	-23564	604.	1.000	1.000	1.000	B31S73
B75		-5	-5140	-12	741	146	49761	1276.	1.000	1.000	1.000	
B75	TNGT	5	-5577	12	-741	-146	-49761	1276.	1.000	1.000	1.000	B31S73
B75A		-5	3401	-12	741	51	15350	394.	1.000	1.000	1.000	
B75A	TNGT	5	-3401	12	-741	-51	-15350	394.	1.000	1.000	1.000	B31S73
B75B		-5	1225	-12	741	-44	-2378	64.	1.000	1.000	1.000	
B75B	TNGT	5	-1225	12	-741	44	2378	64.	1.000	1.000	1.000	B31S73
B75C		-5	-952	-12	741	-140	-3425	90.	1.000	1.000	1.000	
B75C	TNGT	5	952	12	-741	140	3425	90.	1.000	1.000	1.000	B31S73
B80		-5	-3128	-12	741	-235	12211	314.	1.000	1.000	1.000	
B80	TNGT	5	-5385	12	-741	235	-12211	314.	1.000	1.000	1.000	B31S73
B85 B		-5	5056	-12	741	-249	6147	159.	1.000	1.000	1.000	
B85 B	BEND	5	-12	-5056	-741	6147	249	281.	2.356	6.986	6.986	B31S73
B85 M		5	12	4331	755	5869	-282	268.	2.356	6.986	6.986	
B85 M	BEND	-5	-12	-4331	-755	-5869	282	268.	2.356	6.986	6.986	B31S73
B85 E		12	5	3606	8571	12690	-305	694.	2.356	6.986	6.986	
B85 E	TNGT	-12	-3606	5	-8571	305	12690	393.	1.000	1.000	1.000	B31S73
B90		12	3145	-5	8571	-313	-18175	723.	1.871	1.000	1.000	
B90	TNGT	-106	-1397	5	-8302	799	21784	839.	1.871	1.000	1.000	B31S73
B90A		106	-209	-5	8302	-826	-25144	679.	1.000	1.000	1.000	
B90A	TNGT	-106	209	5	-8302	826	25144	679.	1.000	1.000	1.000	B31S73
B95		106	-1815	-5	8302	-852	-19422	542.	1.000	1.000	1.000	
B95	TNGT	-106	-4981	5	-8302	852	19422	542.	1.000	1.000	1.000	B31S73
B95A		106	3783	-5	8302	-872	-37907	995.	1.000	1.000	1.000	

App. 2, p. 34 Calc. 1-1 R. 1

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
B95A	TNGT	-106	-3783	5	-8302	872	37907	995.	1.000	1.000	1.000	B31S73
BSV		106	2585	-5	8302	-892	-51340	1333.	1.000	1.000	1.000	
BSV	TNGT	-106	-2585	5	-8302	892	51340	188.	1.000	1.000	1.000	B31S73
B97		106	1449	-5	8302	-911	-59407	217.	1.000	1.000	1.000	
B97	TNGT	-8662	-7269	-1	-51	1225	48840	323.	1.000	1.000	1.000	B31S73
GB1		6204	5255	1	51	-1210	-118828	785.	1.000	1.000	1.000	
GB1	TNGT	0	51064	0	0	0	139880	924.	1.000	1.000	1.000	B31S73
CV2		0	-51837	0	0	0	0	0.	1.000	1.000	1.000	
GB1	TNGT	-14493	1	-133	727	21052	968	360.	1.000	1.000	1.000	B31S73
GB1A		12328	-1	133	-727	-20311	-960	348.	1.000	1.000	1.000	
GB1A	TNGT	-12328	1	-133	727	20311	960	348.	1.000	1.000	1.000	B31S73
GB1B		10163	-1	133	-727	-19569	-953	335.	1.000	1.000	1.000	
GB1B	TNGT	-10163	1	-133	727	19569	953	335.	1.000	1.000	1.000	B31S73
GB2 B		7998	-1	133	-727	-18828	-945	322.	1.000	1.000	1.000	
GB2 B	BEND	-7998	133	-3	727	-289	18849	493.	2.038	5.622	5.622	B31S73
GB2 M		4805	-4993	3	-306	727	-11043	289.	2.038	5.622	5.622	
GB2 M	BEND	-4805	4993	-3	306	-727	11043	289.	2.038	5.622	5.622	B31S73
GB2 E		-133	-5859	3	301	738	4844	128.	2.038	5.622	5.622	
GB2 E	TNGT	133	-5859	3	-301	738	4844	84.	1.000	1.000	1.000	B31S73
GB2A		-133	3981	-3	301	-754	-28574	488.	1.000	1.000	1.000	
GB2A	TNGT	133	-3981	3	-301	754	28574	488.	1.000	1.000	1.000	B31S73
GB2B		-133	2104	-3	301	-770	-43250	739.	1.000	1.000	1.000	
GB2B	TNGT	133	-2104	3	-301	770	43250	739.	1.000	1.000	1.000	B31S73
GB2C		-133	227	-3	301	-785	-48873	835.	1.000	1.000	1.000	
GB2C	TNGT	133	-227	3	-301	785	48873	835.	1.000	1.000	1.000	B31S73
GB2D		-133	-1650	-3	301	-801	-45442	776.	1.000	1.000	1.000	
GB2D	TNGT	133	1650	3	-301	801	45442	776.	1.000	1.000	1.000	B31S73
GB2E		-133	-3527	-3	301	-816	-32959	563.	1.000	1.000	1.000	
GB2E	TNGT	133	3527	3	-301	816	32959	563.	1.000	1.000	1.000	B31S73
GB4 B		-133	-5404	-3	301	-832	-11422	196.	1.000	1.000	1.000	
GB4 B	BEND	133	-5404	-3	-301	-832	-11422	299.	2.038	5.622	5.622	B31S73
GB4 M		4483	4672	3	804	384	-3340	90.	2.038	5.622	5.622	
GB4 M	BEND	-4483	-4672	-3	-804	-384	3340	90.	2.038	5.622	5.622	B31S73
GB4 E		7544	133	3	843	-289	-10680	280.	2.038	5.622	5.622	

calc. 1-1 R.1
App. 2, P. 35

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
GB4 E	TNGT	-7544	-1	-133	-843	-10663	661	183.	1.000	1.000	1.000	B31S73
GB4A		9279	1	133	843	11258	-667	193.	1.000	1.000	1.000	
GB4A	TNGT	-9279	-1	-133	-843	-11258	667	193.	1.000	1.000	1.000	B31S73
GB4B		11014	1	133	843	11852	-673	203.	1.000	1.000	1.000	
GB4B	TNGT	-11014	-1	-133	-843	-11852	673	203.	1.000	1.000	1.000	B31S73
GB4C		12749	1	133	843	12446	-679	213.	1.000	1.000	1.000	
GB4C	TNGT	-12749	-1	-133	-843	-12446	679	213.	1.000	1.000	1.000	B31S73
GB4D		14484	1	133	843	13041	-686	224.	1.000	1.000	1.000	
GB4D	TNGT	-14484	-1	-133	-843	-13041	686	224.	1.000	1.000	1.000	B31S73
GB4E		16219	1	133	843	13635	-692	234.	1.000	1.000	1.000	
GB4E	TNGT	-16219	-1	-133	-843	-13635	692	234.	1.000	1.000	1.000	B31S73
GB4F		17954	1	133	843	14229	-698	244.	1.000	1.000	1.000	
GB4F	TNGT	-17954	-1	-133	-843	-14229	698	244.	1.000	1.000	1.000	B31S73
GB4G		19690	1	133	843	14824	-704	254.	1.000	1.000	1.000	
GB4G	TNGT	-19690	-1	-133	-843	-14824	704	254.	1.000	1.000	1.000	B31S73
GB5		21425	1	133	843	15418	-711	264.	1.000	1.000	1.000	
C05	TNGT	6	-10860	16	115	-819	-30056	771.	1.080	1.000	1.000	B31S73
C06		-6	9535	-16	-115	744	-17532	450.	1.000	1.000	1.000	
C06	TNGT	6	540	16	115	-744	17532	450.	1.000	1.000	1.000	B31S73
C07		-6	-2764	-16	-115	617	-4590	659.	7.400	1.000	1.000	
C07	TNGT	434	6	16	617	115	4590	659.	7.400	1.000	1.000	B31S73
C07A		741	-6	-16	-617	-182	-4567	118.	1.000	1.000	1.000	
C07A	TNGT	-741	6	16	617	182	4567	118.	1.000	1.000	1.000	B31S73
C07B		1916	-6	-16	-617	-249	-4544	118.	1.000	1.000	1.000	
C07B	TNGT	-1916	6	16	617	249	4544	118.	1.000	1.000	1.000	B31S73
C10 B		3091	-6	-16	-617	-316	-4521	117.	1.000	1.000	1.000	
C10 B	BEND	-3091	6	16	617	316	4521	207.	2.356	6.986	6.986	B31S73
C10 M		2694	-2702	-16	-675	176	-1111	59.	2.356	6.986	6.986	
C10 M	BEND	-2694	2702	16	675	-176	1111	59.	2.356	6.986	6.986	B31S73
C10 E		-6	-4540	-16	-368	564	8541	388.	2.356	6.986	6.986	
C10 E	TNGT	6	4540	16	368	-564	-8541	220.	1.000	1.000	1.000	B31S73
C15		-6	-5098	-16	-368	533	18003	462.	1.000	1.000	1.000	
C15	TNGT	6	-3775	16	368	-533	-18003	462.	1.000	1.000	1.000	B31S73
C15A		-6	2028	-16	-368	433	153	15.	1.000	1.000	1.000	

Calc. 1-1 R.
App. 2, P. 3 of

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
C15A	TNGT	6	-2028	16	368	-433	-153	15.	1.000	1.000	1.000	B31S73
C15B		-6	282	-16	-368	334	-6953	179.	1.000	1.000	1.000	
C15B	TNGT	6	-282	16	368	-334	6953	179.	1.000	1.000	1.000	B31S73
C15C		-6	-1465	-16	-368	234	-3312	86.	1.000	1.000	1.000	
C15C	TNGT	6	1465	16	368	-234	3312	86.	1.000	1.000	1.000	B31S73
C15D		-6	-3212	-16	-368	134	11074	284.	1.000	1.000	1.000	
C15D	TNGT	6	3212	16	368	-134	-11074	284.	1.000	1.000	1.000	B31S73
C20		-6	-4958	-16	-368	35	36205	928.	1.000	1.000	1.000	
C20	TNGT	6	-4523	16	368	-35	-36205	928.	1.000	1.000	1.000	B31S73
C25		-6	1227	-16	-368	-153	2831	73.	1.000	1.000	1.000	
C25	TNGT	6	-1227	16	368	153	-2831	73.	1.000	1.000	1.000	B31S73
C30 B		-6	1037	-16	-368	-164	2076	54.	1.000	1.000	1.000	
C30 B	BEND	6	16	1037	368	-2076	-164	96.	2.356	6.986	6.986	B31S73
C30 M		-15	-7	-313	455	223	196	25.	2.356	6.986	6.986	
C30 M	BEND	15	7	313	-455	-223	-196	25.	2.356	6.986	6.986	B31S73
C30 E		-16	6	412	416	-5	198	21.	2.356	6.986	6.986	
C30 E	TNGT	16	-412	6	-416	-198	-5	12.	1.000	1.000	1.000	B31S73
C35		-16	1929	-6	416	168	-6250	161.	1.000	1.000	1.000	
C35	TNGT	16	2937	6	-416	-168	6250	161.	1.000	1.000	1.000	B31S73
C35A		-16	-1091	-6	416	132	6845	176.	1.000	1.000	1.000	
C35A	TNGT	16	1091	6	-416	-132	-6845	176.	1.000	1.000	1.000	B31S73
C35B		-16	754	-6	416	96	7941	204.	1.000	1.000	1.000	
C35B	TNGT	16	-754	6	-416	-96	-7941	204.	1.000	1.000	1.000	B31S73
C35C		-16	2600	-6	416	59	-2963	77.	1.000	1.000	1.000	
C35C	TNGT	16	-2600	6	-416	-59	2963	77.	1.000	1.000	1.000	B31S73
C40		-16	4446	-6	416	23	-25868	663.	1.000	1.000	1.000	
C40	TNGT	16	4922	6	-416	-23	25868	663.	1.000	1.000	1.000	B31S73
C40A		-16	-3131	-6	416	-12	-476	16.	1.000	1.000	1.000	
C40A	TNGT	16	3131	6	-416	12	476	16.	1.000	1.000	1.000	B31S73
C40B		-16	-1341	-6	416	-47	13625	349.	1.000	1.000	1.000	
C40B	TNGT	16	1341	6	-416	47	-13625	349.	1.000	1.000	1.000	B31S73
C40C		-16	450	-6	416	-83	16434	421.	1.000	1.000	1.000	
C40C	TNGT	16	-450	6	-416	83	-16434	421.	1.000	1.000	1.000	B31S73
C40D		-16	2240	-6	416	-118	7952	204.	1.000	1.000	1.000	

Calc. 1-1 R.1
Att 2, p. 37

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
C40D	TNGT	16	-2240	6	-416	118	-7952	204.	1.000	1.000	1.000	B31S73
C40E		-16	4031	-6	416	-153	-11822	303.	1.000	1.000	1.000	
C40E	TNGT	16	-4031	6	-416	153	11822	303.	1.000	1.000	1.000	B31S73
C45		-16	5821	-6	416	-188	-42887	1099.	1.000	1.000	1.000	
C45	TNGT	16	6365	6	-416	188	42887	1099.	1.000	1.000	1.000	B31S73
C45A		-16	-4572	-6	416	-223	-8338	214.	1.000	1.000	1.000	
C45A	TNGT	16	4572	6	-416	223	8338	214.	1.000	1.000	1.000	B31S73
C45B		-16	-2778	-6	416	-259	14880	382.	1.000	1.000	1.000	
C45B	TNGT	16	2778	6	-416	259	-14880	382.	1.000	1.000	1.000	B31S73
C45C		-16	-984	-6	416	-294	26765	686.	1.000	1.000	1.000	
C45C	TNGT	16	984	6	-416	294	-26765	686.	1.000	1.000	1.000	B31S73
C45D		-16	809	-6	416	-329	27319	700.	1.000	1.000	1.000	
C45D	TNGT	16	-809	6	-416	329	-27319	700.	1.000	1.000	1.000	B31S73
C45E		-16	2603	-6	416	-364	16541	424.	1.000	1.000	1.000	
C45E	TNGT	16	-2603	6	-416	364	-16541	424.	1.000	1.000	1.000	B31S73
C50		-16	4397	-6	416	-400	-5570	144.	1.000	1.000	1.000	
C50	TNGT	16	5224	6	-416	400	5570	144.	1.000	1.000	1.000	B31S73
C50A		-16	-3620	-6	416	-431	19403	498.	1.000	1.000	1.000	
C50A	TNGT	16	3620	6	-416	431	-19403	498.	1.000	1.000	1.000	B31S73
C50B		-16	-2017	-6	416	-463	35320	905.	1.000	1.000	1.000	
C50B	TNGT	16	2017	6	-416	463	-35320	905.	1.000	1.000	1.000	B31S73
C50C		-16	-413	-6	416	-494	42182	1081.	1.000	1.000	1.000	
C50C	TNGT	16	413	6	-416	494	-42182	1081.	1.000	1.000	1.000	B31S73
C50D		-16	1190	-6	416	-526	39989	1025.	1.000	1.000	1.000	
C50D	TNGT	16	-1190	6	-416	526	-39989	1025.	1.000	1.000	1.000	B31S73
C50E		-16	2794	-6	416	-557	28740	737.	1.000	1.000	1.000	
C50E	TNGT	16	-2794	6	-416	557	-28740	737.	1.000	1.000	1.000	B31S73
C55		-16	4397	-6	416	-589	8435	217.	1.000	1.000	1.000	
C55	TNGT	16	-4397	6	-416	589	-8435	217.	1.000	1.000	1.000	B31S73
C60		-16	5546	-6	416	-611	-11684	300.	1.000	1.000	1.000	
C60	TNGT	16	2167	6	-416	611	11684	300.	1.000	1.000	1.000	B31S73
C65 B		-16	-896	-6	416	-636	-4832	125.	1.000	1.000	1.000	
C65 B	BEND	16	6	-896	-416	4832	-636	221.	2.356	6.986	6.986	B31S73
C65 M		-15	7	172	-2504	-2529	634	164.	2.356	6.986	6.986	

Calc. 1-1 R.1
Att. 2, p. 33

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
C65 M	BEND	15	-7	-172	2504	2529	-634	164.	2.356	6.986	6.986	B31S73
C65 E		-6	16	-553	-3630	-502	602	168.	2.356	6.986	6.986	
C65 E	TNGT	6	553	16	3630	-602	-502	95.	1.000	1.000	1.000	B31S73
C65A		-6	-1615	-16	-3630	541	4560	150.	1.000	1.000	1.000	
C65A	TNGT	6	1615	16	3630	-541	-4560	150.	1.000	1.000	1.000	B31S73
C70		-6	-2678	-16	-3630	481	12593	336.	1.000	1.000	1.000	
C70	TNGT	6	-2921	16	3630	-481	-12593	336.	1.000	1.000	1.000	B31S73
C70A		-6	1240	-16	-3630	385	273	94.	1.000	1.000	1.000	
C70A	TNGT	6	-1240	16	3630	-385	-273	94.	1.000	1.000	1.000	B31S73
C70B		-6	-440	-16	-3630	289	-2096	108.	1.000	1.000	1.000	
C70B	TNGT	6	440	16	3630	-289	2096	108.	1.000	1.000	1.000	B31S73
C70C		-6	-2121	-16	-3630	194	5488	169.	1.000	1.000	1.000	
C70C	TNGT	6	2121	16	3630	-194	-5488	169.	1.000	1.000	1.000	B31S73
C75		-6	-3802	-16	-3630	98	23024	597.	1.000	1.000	1.000	
C75	TNGT	6	-4329	16	3630	-98	-23024	597.	1.000	1.000	1.000	B31S73
C75A		-6	2614	-16	-3630	0	2051	107.	1.000	1.000	1.000	
C75A	TNGT	6	-2614	16	3630	0	-2051	107.	1.000	1.000	1.000	B31S73
C75B		-6	898	-16	-3630	-98	-8558	238.	1.000	1.000	1.000	
C75B	TNGT	6	-898	16	3630	98	8558	238.	1.000	1.000	1.000	B31S73
C75C		-6	-817	-16	-3630	-195	-8804	244.	1.000	1.000	1.000	
C75C	TNGT	6	817	16	3630	195	8804	244.	1.000	1.000	1.000	B31S73
C80		-6	-2532	-16	-3630	-293	1313	99.	1.000	1.000	1.000	
C80	TNGT	6	-3643	16	3630	293	-1313	99.	1.000	1.000	1.000	B31S73
C85 B		-6	3288	-16	-3630	-313	-3018	121.	1.000	1.000	1.000	
C85 B	BEND	6	-16	-3288	3630	-3018	313	214.	2.356	6.986	6.986	B31S73
C85 M		7	15	2563	2462	11379	-356	527.	2.356	6.986	6.986	
C85 M	BEND	-7	-15	-2563	-2462	-11379	356	527.	2.356	6.986	6.986	B31S73
C85 E		16	6	1839	11993	11317	-384	747.	2.356	6.986	6.986	
C85 E	TNGT	-16	-1839	6	-11993	384	11317	423.	1.000	1.000	1.000	B31S73
C90		16	1377	-6	11993	-393	-13930	661.	1.871	1.000	1.000	
C90	TNGT	133	-1838	46	-12037	590	13497	651.	1.871	1.000	1.000	B31S73
C95		-133	-257	-46	12037	-931	-19330	584.	1.000	1.000	1.000	
C95	TNGT	133	-6167	46	-12037	931	19330	584.	1.000	1.000	1.000	B31S73
C96		-133	4038	-46	12037	-1278	-57600	1509.	1.000	1.000	1.000	

Calc. 1-1 R.1
App. 2, p. 39

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
C96	TNGT	133	-4038	46	-12037	1278	57600	1509.	1.000	1.000	1.000	B31S73
CSV		-133	3683	-46	12037	-1335	-62426	1630.	1.000	1.000	1.000	
CSV	TNGT	133	-3683	46	-12037	1335	62426	230.	1.000	1.000	1.000	B31S73
C97		-133	2547	-46	12037	-1520	-74885	274.	1.000	1.000	1.000	
C97	TNGT	-8704	-7288	24	1039	-1016	48492	321.	1.000	1.000	1.000	B31S73
GC1		6246	5274	-24	-1039	746	-118694	784.	1.000	1.000	1.000	
GC1	TNGT	0	51023	0	0	0	139769	924.	1.000	1.000	1.000	B31S73
CV3		0	-51796	0	0	0	0	0.	1.000	1.000	1.000	
GC1	TNGT	-14497	-24	-121	331	21075	-1235	361.	1.000	1.000	1.000	B31S73
GC1A		12332	24	121	-331	-20401	1101	349.	1.000	1.000	1.000	
GC1A	TNGT	-12332	-24	-121	331	20401	-1101	349.	1.000	1.000	1.000	B31S73
GC1B		10167	24	121	-331	-19727	966	337.	1.000	1.000	1.000	
GC1B	TNGT	-10167	-24	-121	331	19727	-966	337.	1.000	1.000	1.000	B31S73
GC2 B		8002	24	121	-331	-19053	832	326.	1.000	1.000	1.000	
GC2 B	BEND	-8002	122	-20	331	169	19070	498.	2.038	5.622	5.622	B31S73
GC2 M		4816	-4988	20	-333	164	-11288	295.	2.038	5.622	5.622	
GC2 M	BEND	-4816	4988	-20	333	-164	11288	295.	2.038	5.622	5.622	B31S73
GC2 E		-122	-5863	20	-99	401	4598	121.	2.038	5.622	5.622	
GC2 E	TNGT	122	-5863	20	99	401	4598	79.	1.000	1.000	1.000	B31S73
GC2A		-122	3986	-20	-99	-497	-28348	484.	1.000	1.000	1.000	
GC2A	TNGT	122	-3986	20	99	497	28348	484.	1.000	1.000	1.000	B31S73
GC2B		-122	2109	-20	-99	-593	-43044	735.	1.000	1.000	1.000	
GC2B	TNGT	122	-2109	20	99	593	43044	735.	1.000	1.000	1.000	B31S73
GC2C		-122	232	-20	-99	-689	-48688	832.	1.000	1.000	1.000	
GC2C	TNGT	122	-232	20	99	689	48688	832.	1.000	1.000	1.000	B31S73
GC2D		-122	-1646	-20	-99	-785	-45277	774.	1.000	1.000	1.000	
GC2D	TNGT	122	1646	20	99	785	45277	774.	1.000	1.000	1.000	B31S73
GC2E		-122	-3523	-20	-99	-881	-32814	561.	1.000	1.000	1.000	
GC2E	TNGT	122	3523	20	99	881	32814	561.	1.000	1.000	1.000	B31S73
GC4 B		-122	-5400	-20	-99	-977	-11297	194.	1.000	1.000	1.000	
GC4 B	BEND	122	-5400	-20	99	-977	-11297	296.	2.038	5.622	5.622	B31S73
GC4 M		4488	4661	20	641	810	-3443	94.	2.038	5.622	5.622	
GC4 M	BEND	-4488	-4661	-20	-641	-810	3443	94.	2.038	5.622	5.622	B31S73
GC4 E		7539	122	20	1047	169	-10750	282.	2.038	5.622	5.622	

Calc. 1-1 R.1 Att. 2, p. 45

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
GC4 E	TNGT	-7539	24	-121	-1047	-10738	-543	185.	1.000	1.000	1.000	B31S73
GC4A		9275	-24	121	1047	11278	650	194.	1.000	1.000	1.000	
GC4A	TNGT	-9275	24	-121	-1047	-11278	-650	194.	1.000	1.000	1.000	B31S73
GC4B		11010	-24	121	1047	11818	758	203.	1.000	1.000	1.000	
GC4B	TNGT	-11010	24	-121	-1047	-11818	-758	203.	1.000	1.000	1.000	B31S73
GC4C		12745	-24	121	1047	12359	866	212.	1.000	1.000	1.000	
GC4C	TNGT	-12745	24	-121	-1047	-12359	-866	212.	1.000	1.000	1.000	B31S73
GC4D		14480	-24	121	1047	12899	973	222.	1.000	1.000	1.000	
GC4D	TNGT	-14480	24	-121	-1047	-12899	-973	222.	1.000	1.000	1.000	B31S73
GC4E		16215	-24	121	1047	13439	1081	231.	1.000	1.000	1.000	
GC4E	TNGT	-16215	24	-121	-1047	-13439	-1081	231.	1.000	1.000	1.000	B31S73
GC4F		17950	-24	121	1047	13980	1189	240.	1.000	1.000	1.000	
GC4F	TNGT	-17950	24	-121	-1047	-13980	-1189	240.	1.000	1.000	1.000	B31S73
GC4G		19685	-24	121	1047	14520	1296	250.	1.000	1.000	1.000	
GC4G	TNGT	-19685	24	-121	-1047	-14520	-1296	250.	1.000	1.000	1.000	B31S73
GC5		21421	-24	121	1047	15060	1404	259.	1.000	1.000	1.000	
D05	TNGT	10	-10991	35	3525	-1830	-30542	789.	1.080	1.000	1.000	B31S73
D06		-10	9666	-35	-3525	1666	-17656	463.	1.000	1.000	1.000	
D06	TNGT	10	409	35	3525	-1666	17656	463.	1.000	1.000	1.000	B31S73
D07		-10	-2633	-35	-3525	1390	-5739	978.	7.400	1.000	1.000	
D07	TNGT	584	10	35	1390	3525	5739	978.	7.400	1.000	1.000	B31S73
D07A		591	-10	-35	-1390	-3671	-5699	177.	1.000	1.000	1.000	
D07A	TNGT	-591	10	35	1390	3671	5699	177.	1.000	1.000	1.000	B31S73
D07B		1766	-10	-35	-1390	-3816	-5658	179.	1.000	1.000	1.000	
D07B	TNGT	-1766	10	35	1390	3816	5658	179.	1.000	1.000	1.000	B31S73
D10 B		2941	-10	-35	-1390	-3962	-5617	180.	1.000	1.000	1.000	
D10 B	BEND	-2941	10	35	1390	3962	5617	318.	2.356	6.986	6.986	B31S73
D10 M		2585	-2599	-35	-3818	-1899	-2340	220.	2.356	6.986	6.986	
D10 M	BEND	-2585	2599	35	3818	1899	2340	220.	2.356	6.986	6.986	B31S73
D10 E		-10	-4391	-35	-4076	1276	6973	370.	2.356	6.986	6.986	
D10 E	TNGT	10	4391	35	4076	-1276	-6973	210.	1.000	1.000	1.000	B31S73
D15		-10	-4948	-35	-4076	1207	16141	428.	1.000	1.000	1.000	
D15	TNGT	10	-3920	35	4076	-1207	-16141	428.	1.000	1.000	1.000	B31S73
D15A		-10	1736	-35	-4076	937	-5606	179.	1.000	1.000	1.000	

Calc. 1-1 R
App. 2, P. 5

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
D15A	TNGT	10	-1736	35	4076	-937	5606	179.	1.000	1.000	1.000	B31S73
D15B		-10	-447	-35	-4076	667	-10565	291.	1.000	1.000	1.000	
D15B	TNGT	10	447	35	4076	-667	10565	291.	1.000	1.000	1.000	B31S73
D15C		-10	-2630	-35	-4076	396	1267	110.	1.000	1.000	1.000	
D15C	TNGT	10	2630	35	4076	-396	-1267	110.	1.000	1.000	1.000	B31S73
D20		-10	-4814	-35	-4076	126	29889	773.	1.000	1.000	1.000	
D20	TNGT	10	-3069	35	4076	-126	-29889	773.	1.000	1.000	1.000	B31S73
D20A		-10	891	-35	-4076	-144	14697	391.	1.000	1.000	1.000	
D20A	TNGT	10	-891	35	4076	144	-14697	391.	1.000	1.000	1.000	B31S73
D25		-10	-1315	-35	-4076	-417	16345	432.	1.000	1.000	1.000	
D25	TNGT	10	-4424	35	4076	417	-16345	432.	1.000	1.000	1.000	B31S73
D30 B		-10	4235	-35	-4076	-440	13458	361.	1.000	1.000	1.000	
D30 B	BEND	10	35	4235	4076	-13458	-440	637.	2.356	6.986	6.986	B31S73
D30 M		-32	-18	-3510	2838	3545	512	207.	2.356	6.986	6.986	
D30 M	BEND	32	18	3510	-2838	-3545	-512	207.	2.356	6.986	6.986	B31S73
D30 E		-35	10	-2785	1407	-6688	523	310.	2.356	6.986	6.986	
D30 E	TNGT	35	2785	10	-1407	-523	-6688	176.	1.000	1.000	1.000	B31S73
D30A		-35	-1594	-10	1407	482	15879	409.	1.000	1.000	1.000	
D30A	TNGT	35	1594	10	-1407	-482	-15879	409.	1.000	1.000	1.000	B31S73
D33		-35	-402	-10	1407	441	20068	516.	1.000	1.000	1.000	
D33	TNGT	35	402	10	-1407	-441	-20068	516.	1.000	1.000	1.000	B31S73
D35		-35	1006	-10	1407	392	18569	477.	1.000	1.000	1.000	
D35	TNGT	35	1612	10	-1407	-392	-18569	477.	1.000	1.000	1.000	B31S73
D35A		-35	175	-10	1407	330	23090	593.	1.000	1.000	1.000	
D35A	TNGT	35	-175	10	-1407	-330	-23090	593.	1.000	1.000	1.000	B31S73
D35B		-35	1962	-10	1407	269	16363	421.	1.000	1.000	1.000	
D35B	TNGT	35	-1962	10	-1407	-269	-16363	421.	1.000	1.000	1.000	B31S73
D35C		-35	3749	-10	1407	207	-1612	55.	1.000	1.000	1.000	
D35C	TNGT	35	-3749	10	-1407	-207	1612	55.	1.000	1.000	1.000	B31S73
D40		-35	5536	-10	1407	145	-30835	791.	1.000	1.000	1.000	
D40	TNGT	35	5118	10	-1407	-145	30835	791.	1.000	1.000	1.000	B31S73
D40A		-35	-3321	-10	1407	83	-4122	112.	1.000	1.000	1.000	
D40A	TNGT	35	3321	10	-1407	-83	4122	112.	1.000	1.000	1.000	B31S73
D40B		-35	-1524	-10	1407	21	11213	290.	1.000	1.000	1.000	

Calc. 1-1 R.1
Att. 2, p. 42

ELEMENT FROM / TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI) .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
D40B	TNGT	35	1524	10	-1407	-21	-11213	290.	1.000	1.000	1.000	B31S73
D40C		-35	274	-10	1407	-41	15169	390.	1.000	1.000	1.000	
D40C	TNGT	35	-274	10	-1407	41	-15169	390.	1.000	1.000	1.000	B31S73
D40D		-35	2071	-10	1407	-103	7747	202.	1.000	1.000	1.000	
D40D	TNGT	35	-2071	10	-1407	103	-7747	202.	1.000	1.000	1.000	B31S73
D40E		-35	3869	-10	1407	-165	-11054	286.	1.000	1.000	1.000	
D40E	TNGT	35	-3869	10	-1407	165	11054	286.	1.000	1.000	1.000	B31S73
D45		-35	5666	-10	1407	-227	-41234	1057.	1.000	1.000	1.000	
D45	TNGT	35	6255	10	-1407	227	41234	1057.	1.000	1.000	1.000	B31S73
D45A		-35	-4461	-10	1407	-289	-7377	193.	1.000	1.000	1.000	
D45A	TNGT	35	4461	10	-1407	289	7377	193.	1.000	1.000	1.000	B31S73
D45B		-35	-2668	-10	1407	-351	15146	390.	1.000	1.000	1.000	
D45B	TNGT	35	2668	10	-1407	351	-15146	390.	1.000	1.000	1.000	B31S73
D45C		-35	-874	-10	1407	-413	26333	676.	1.000	1.000	1.000	
D45C	TNGT	35	874	10	-1407	413	-26333	676.	1.000	1.000	1.000	B31S73
D45D		-35	920	-10	1407	-474	26185	672.	1.000	1.000	1.000	
D45D	TNGT	35	-920	10	-1407	474	-26185	672.	1.000	1.000	1.000	B31S73
D45E		-35	2714	-10	1407	-536	14703	379.	1.000	1.000	1.000	
D45E	TNGT	35	-2714	10	-1407	536	-14703	379.	1.000	1.000	1.000	B31S73
D50		-35	4508	-10	1407	-598	-8115	212.	1.000	1.000	1.000	
D50	TNGT	35	5308	10	-1407	598	8115	212.	1.000	1.000	1.000	B31S73
D50A		-35	-3705	-10	1407	-654	17327	446.	1.000	1.000	1.000	
D50A	TNGT	35	3705	10	-1407	654	-17327	446.	1.000	1.000	1.000	B31S73
D50B		-35	-2102	-10	1407	-709	33720	865.	1.000	1.000	1.000	
D50B	TNGT	35	2102	10	-1407	709	-33720	865.	1.000	1.000	1.000	B31S73
D50C		-35	-499	-10	1407	-764	41063	1053.	1.000	1.000	1.000	
D50C	TNGT	35	499	10	-1407	764	-41063	1053.	1.000	1.000	1.000	B31S73
D50D		-35	1104	-10	1407	-820	39356	1010.	1.000	1.000	1.000	
D50D	TNGT	35	-1104	10	-1407	820	-39356	1010.	1.000	1.000	1.000	B31S73
D50E		-35	2707	-10	1407	-875	28600	734.	1.000	1.000	1.000	
D50E	TNGT	35	-2707	10	-1407	875	-28600	734.	1.000	1.000	1.000	B31S73
D55		-35	4310	-10	1407	-930	8793	229.	1.000	1.000	1.000	
D55	TNGT	35	-4310	10	-1407	930	-8793	229.	1.000	1.000	1.000	B31S73
D60		-35	5456	-10	1407	-970	-10915	283.	1.000	1.000	1.000	

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
D60	TNGT	35	1252	10	-1407	970	10915	283.	1.000	1.000	1.000	B31S73
D65 B		-35	-1115	-10	1407	-974	-10342	269.	1.000	1.000	1.000	
D65 B	BEND	35	10	-1115	-1407	10342	-974	475.	2.356	6.986	6.986	B31S73
D65 M		-32	18	390	-5492	-6625	964	392.	2.356	6.986	6.986	
D65 M	BEND	32	-18	-390	5492	6625	-964	392.	2.356	6.986	6.986	B31S73
D65 E		-10	35	-335	-8431	-783	892	386.	2.356	6.986	6.986	
D65 E	TNGT	10	335	35	8431	-892	-783	218.	1.000	1.000	1.000	B31S73
D65A		-10	-938	-35	-8431	817	2136	224.	1.000	1.000	1.000	
D65A	TNGT	10	938	35	8431	-817	-2136	224.	1.000	1.000	1.000	B31S73
D70		-10	-1541	-35	-8431	743	4770	249.	1.000	1.000	1.000	
D70	TNGT	10	-2923	35	8431	-743	-4770	249.	1.000	1.000	1.000	B31S73
D70A		-10	1450	-35	-8431	560	-6569	274.	1.000	1.000	1.000	
D70A	TNGT	10	-1450	35	8431	-560	6569	274.	1.000	1.000	1.000	B31S73
D70B		-10	-22	-35	-8431	378	-10272	341.	1.000	1.000	1.000	
D70B	TNGT	10	22	35	8431	-378	10272	341.	1.000	1.000	1.000	B31S73
D70C		-10	-1495	-35	-8431	196	-6339	270.	1.000	1.000	1.000	
D70C	TNGT	10	1495	35	8431	-196	6339	270.	1.000	1.000	1.000	B31S73
D75		-10	-2967	-35	-8431	13	5231	254.	1.000	1.000	1.000	
D75	TNGT	10	-2998	35	8431	-13	-5231	254.	1.000	1.000	1.000	B31S73
D75A		-10	1256	-35	-8431	-202	-7816	295.	1.000	1.000	1.000	
D75A	TNGT	10	-1256	35	8431	202	7816	295.	1.000	1.000	1.000	B31S73
D75B		-10	-485	-35	-8431	-418	-10180	339.	1.000	1.000	1.000	
D75B	TNGT	10	485	35	8431	418	10180	339.	1.000	1.000	1.000	B31S73
D80		-10	-2227	-35	-8431	-633	-1864	222.	1.000	1.000	1.000	
D80	TNGT	10	-1907	35	8431	633	1864	222.	1.000	1.000	1.000	B31S73
D85 B		-10	1096	-35	-8431	-734	-6149	268.	1.000	1.000	1.000	
D85 B	BEND	10	-35	-1096	8431	-6149	734	474.	2.356	6.986	6.986	B31S73
D85 M		18	32	372	-805	11951	-824	544.	2.356	6.986	6.986	
D85 M	BEND	-18	-32	-372	805	-11951	824	544.	2.356	6.986	6.986	B31S73
D85 E		35	10	-353	8000	8995	-880	547.	2.356	6.986	6.986	
D85 E	TNGT	-35	353	10	-8000	880	8995	309.	1.000	1.000	1.000	B31S73
D90		35	-815	-10	8000	-896	-8046	409.	1.871	1.000	1.000	
D90	TNGT	46	2057	-141	-8210	2309	11829	524.	1.871	1.000	1.000	B31S73
D95		-46	-3010	141	8210	-1836	-3318	232.	1.000	1.000	1.000	

Calc. 1-1 R.1
Att. 2, p. 4-4

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI) .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
D95	TNGT	46	-3408	-141	-8210	1836	3318	232.	1.000	1.000	1.000	B31S73
D96		-46	1310	141	8210	-794	-20751	572.	1.000	1.000	1.000	
D96	TNGT	46	-1310	-141	-8210	794	20751	572.	1.000	1.000	1.000	B31S73
DSV		-46	1026	141	8210	-654	-21919	600.	1.000	1.000	1.000	
DSV	TNGT	46	-1026	-141	-8210	654	21919	85.	1.000	1.000	1.000	B31S73
D97		-46	-111	141	8210	-90	-23749	91.	1.000	1.000	1.000	
D97	TNGT	0	-66417	0	0	0	-242630	876.	1.000	1.000	1.000	B31S73
MS4		0	67447	0	0	0	0	0.	1.000	1.000	1.000	
D97	TNGT	-9951	-7919	-241	2059	9857	41917	285.	1.000	1.000	1.000	B31S73
GD1		7493	5906	241	-2059	-7168	-119178	789.	1.000	1.000	1.000	
GD1	TNGT	0	49678	0	0	0	136112	899.	1.000	1.000	1.000	B31S73
CV4		0	-50451	0	0	0	0	0.	1.000	1.000	1.000	
GD1	TNGT	-14516	241	180	6135	16934	4240	316.	1.000	1.000	1.000	B31S73
GD1A		12352	-241	-180	-6135	-17936	-2901	328.	1.000	1.000	1.000	
GD1A	TNGT	-12352	241	180	6135	17936	2901	328.	1.000	1.000	1.000	B31S73
GD1B		10187	-241	-180	-6135	-18939	-1563	341.	1.000	1.000	1.000	
GD1B	TNGT	-10187	241	180	6135	18939	1563	341.	1.000	1.000	1.000	B31S73
GD2 B		8022	-241	-180	-6135	-19941	-225	356.	1.000	1.000	1.000	
GD2 B	BEND	-8022	-189	234	6135	-965	19919	545.	2.038	5.622	5.622	B31S73
GD2 M		5049	-4782	-234	-3896	4442	-12887	370.	2.038	5.622	5.622	
GD2 M	BEND	-5049	4782	234	3896	-4442	12887	370.	2.038	5.622	5.622	B31S73
GD2 E		189	-5882	-234	147	5317	2728	156.	2.038	5.622	5.622	
GD2 E	TNGT	-189	-5882	-234	-147	5317	2728	102.	1.000	1.000	1.000	B31S73
GD2A		189	4005	234	147	-4190	-26574	460.	1.000	1.000	1.000	
GD2A	TNGT	-189	-4005	-234	-146	4190	26574	460.	1.000	1.000	1.000	B31S73
GD2B		189	2128	234	146	-3062	-41364	709.	1.000	1.000	1.000	
GD2B	TNGT	-189	-2128	-234	-147	3062	41364	709.	1.000	1.000	1.000	B31S73
GD2C		189	250	234	147	-1935	-47099	805.	1.000	1.000	1.000	
GD2C	TNGT	-189	-250	-234	-147	1935	47099	805.	1.000	1.000	1.000	B31S73
GD2D		189	-1627	234	147	-807	-43779	748.	1.000	1.000	1.000	
GD2D	TNGT	-189	1627	-234	-146	807	43779	748.	1.000	1.000	1.000	B31S73
GD2E		189	-3504	234	146	320	-31404	536.	1.000	1.000	1.000	
GD2E	TNGT	-189	3504	-234	-147	-320	31404	536.	1.000	1.000	1.000	B31S73
GD4 B		189	-5382	234	147	1447	-9973	172.	1.000	1.000	1.000	

Calc 1-1 R1
App. 2, P. 65

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
GD4 B	BEND	-189	-5382	234	-147	1447	-9973	263.	2.038	5.622	5.622	B31S73
GD4 M		4695	4428	-234	-1159	-1705	-4403	127.	2.038	5.622	5.622	
GD4 M	BEND	-4695	-4428	234	1159	1705	4403	127.	2.038	5.622	5.622	B31S73
GD4 E		7521	-189	-234	-2265	-965	-10922	292.	2.038	5.622	5.622	
GD4 E	TNGT	-7521	-241	180	2265	-10950	559	191.	1.000	1.000	1.000	B31S73
GD4A		9723	241	-180	-2265	9931	-1920	177.	1.000	1.000	1.000	
GD4A	TNGT	-9723	-241	180	2265	-9931	1920	177.	1.000	1.000	1.000	B31S73
GD4B		11924	241	-180	-2265	8911	-3280	167.	1.000	1.000	1.000	
GD4B	TNGT	-11924	-241	180	2265	-8911	3280	167.	1.000	1.000	1.000	B31S73
GD4C		14125	241	-180	-2265	7892	-4641	161.	1.000	1.000	1.000	
GD4C	TNGT	-14125	-241	180	2265	-7892	4641	161.	1.000	1.000	1.000	B31S73
GD4D		16327	241	-180	-2265	6873	-6002	161.	1.000	1.000	1.000	
GD4D	TNGT	-16327	-241	180	2265	-6873	6002	161.	1.000	1.000	1.000	B31S73
GD4E		18528	241	-180	-2265	5853	-7363	165.	1.000	1.000	1.000	
GD4E	TNGT	-18528	-241	180	2265	-5853	7363	165.	1.000	1.000	1.000	B31S73
GD4F		20729	241	-180	-2265	4834	-8723	175.	1.000	1.000	1.000	
GD4F	TNGT	-20729	-241	180	2265	-4834	8723	175.	1.000	1.000	1.000	B31S73
GD4G		22931	241	-180	-2265	3814	-10084	188.	1.000	1.000	1.000	
GD4G	TNGT	-22931	-241	180	2265	-3814	10084	188.	1.000	1.000	1.000	B31S73
GD5 B		25132	241	-180	-2265	2795	-11445	205.	1.000	1.000	1.000	
GD5 B	BEND	-25132	-241	180	2265	-2795	11445	410.	2.670	8.433	8.433	B31S73
GD5 M		18445	-18105	-180	251	3281	5655	224.	2.670	8.433	8.433	
GD5 M	BEND	-18445	18105	180	-251	-3281	-5655	224.	2.670	8.433	8.433	B31S73
GD5 E		241	-26558	-180	2375	1845	48754	1671.	2.670	8.433	8.433	
GD5 E	TNGT	-241	26558	180	-2375	-1845	-48754	834.	1.000	1.000	1.000	B31S73
GD6		241	-26818	-180	2375	1725	66546	1138.	1.000	1.000	1.000	
A90	TNGT	-718	137	-110	-658	-1121	3916	530.	1.871	1.000	1.000	B31S73
105 B		822	-137	110	658	1213	-3802	469.	1.000	1.000	1.000	
105 B	BEND	-822	137	-110	-658	-1213	3802	627.	1.782	4.598	4.598	B31S73
105 M		605	-799	110	1379	529	-3153	540.	1.782	4.598	4.598	
105 M	BEND	-605	799	-110	-1379	-529	3153	540.	1.782	4.598	4.598	B31S73
105 E		-137	-1163	110	1405	-465	-1743	355.	1.782	4.598	4.598	
105 E	TNGT	137	1163	-110	-1405	465	1743	265.	1.000	1.000	1.000	B31S73
105A		-137	-1589	110	1405	-86	2987	383.	1.000	1.000	1.000	

Calc. 1-1 R. 1
App. 2, P. 46

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
105A	TNGT	137	1589	-110	-1405	86	-2987	383.	1.000	1.000	1.000	B31S73
110		-137	-2016	110	1405	292	9184	1079.	1.000	1.000	1.000	
110	TNGT	137	-1661	-110	-1405	-292	-9184	1079.	1.000	1.000	1.000	B31S73
110A		-137	1011	110	1405	870	2186	318.	1.000	1.000	1.000	
110A	TNGT	137	-110	1011	-1405	-2186	870	318.	1.000	1.000	1.000	B31S73
115		-137	110	-361	1405	-1407	-1447	250.	1.461	1.000	1.000	
115	TNGT	-151	12	-29	-908	8567	155	529.	1.461	1.000	1.000	B31S73
115A		151	-12	1075	908	-5578	-90	317.	1.000	1.000	1.000	
115A	TNGT	-151	1075	12	-908	-90	5578	317.	1.000	1.000	1.000	B31S73
115B		151	-2121	-12	908	25	3077	180.	1.000	1.000	1.000	
115B	TNGT	-151	2121	12	-908	-25	-3077	180.	1.000	1.000	1.000	B31S73
120		151	-3166	-12	908	-39	17396	976.	1.000	1.000	1.000	
120	TNGT	-151	-2622	12	-908	39	-17396	976.	1.000	1.000	1.000	B31S73
120A		151	1632	-12	908	-100	6495	367.	1.000	1.000	1.000	
120A	TNGT	-151	-1632	12	-908	100	-6495	367.	1.000	1.000	1.000	B31S73
120B		151	643	-12	908	-162	664	64.	1.000	1.000	1.000	
120B	TNGT	-151	-643	12	-908	162	-664	64.	1.000	1.000	1.000	B31S73
120C		151	-347	-12	908	-223	-95	53.	1.000	1.000	1.000	
120C	TNGT	-151	347	12	-908	223	95	53.	1.000	1.000	1.000	B31S73
125		151	-1336	-12	908	-284	4217	1090.	6.000	1.000	1.000	
125	TNGT	-151	-2083	12	-908	284	-4217	1090.	6.000	1.000	1.000	B31S73
130 B		151	1488	-12	908	-321	-1287	90.	1.000	1.000	1.000	
130 B	BEND	-151	-12	-1488	-908	-1287	321	123.	1.821	4.747	4.747	B31S73
130 M		115	-98	1146	2456	2348	-240	261.	1.821	4.747	4.747	
130 M	BEND	-115	98	-1146	-2456	-2348	240	261.	1.821	4.747	4.747	B31S73
130 E		12	-151	805	4076	1461	-8	331.	1.821	4.747	4.747	
130 E	TNGT	-12	-805	-151	-4076	8	1461	243.	1.000	1.000	1.000	B31S73
133 B		12	660	151	4076	105	-2011	255.	1.000	1.000	1.000	
133 B	BEND	-12	151	-660	-4076	-2011	-105	456.	2.386	7.121	7.121	B31S73
133 M		-98	-115	433	4560	-887	270	466.	2.386	7.121	7.121	
133 M	BEND	98	115	-433	-4560	887	-270	466.	2.386	7.121	7.121	B31S73
135		-151	-12	205	2754	-3520	349	449.	2.386	7.121	7.121	
135	TNGT	151	205	12	-2754	349	3520	251.	1.000	1.000	1.000	B31S73
140		-151	-157	-12	2754	-352	-3475	249.	1.000	1.000	1.000	

Calc. 1-1 R.1
App. 2, p. 47

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
140	TNGT	151	157	12	-2754	352	3475	249.	1.000	1.000	1.000	B31S7
144		-151	-12	-12	2754	-361	-3411	246.	1.000	1.000	1.000	
144	TNGT	151	12	12	-2754	361	3411	246.	1.000	1.000	1.000	B31S7
145		-151	8739	-12	2754	-390	-13955	797.	1.000	1.000	1.000	
145	TNGT	151	17950	12	-2754	390	13955	797.	1.000	1.000	1.000	B31S7
146		-151	20071	-12	2754	-515	-25091	1414.	1.000	1.000	1.000	
146	TNGT	151	9952	12	-2754	515	25091	1414.	1.000	1.000	1.000	B31S7
147		-151	-1201	-12	2754	-544	-11614	669.	1.000	1.000	1.000	
147	TNGT	151	1201	12	-2754	544	11614	669.	1.000	1.000	1.000	B31S7
150		-151	-1144	-12	2754	-547	-11266	650.	1.000	1.000	1.000	
150	BEND	151	662	-933	-2753	9566	5976	1163.	2.386	7.121	7.121	B31S7
155 M		-367	-495	839	-1005	-9386	-5633	1101.	2.386	7.121	7.121	
155 M	BEND	367	495	-839	1005	9386	5633	1101.	2.386	7.121	7.121	B31S7
155 E		-483	-271	746	-4420	-7837	-5406	1052.	2.386	7.121	7.121	
155 E	TNGT	483	789	-86	4420	-1391	9419	588.	1.000	1.000	1.000	B31S7
160 B		-201	-148	86	-4420	1704	-7719	507.	1.000	1.000	1.000	
160 B	BEND	201	12	171	4420	-6174	-4937	693.	1.821	4.747	4.747	B31S7
160 M		-153	-24	-31	-1749	7307	4950	688.	1.821	4.747	4.747	
160 M	BEND	153	24	31	1749	-7307	-4950	688.	1.821	4.747	4.747	B31S7
160 E		-151	-61	108	1176	7456	4987	692.	1.821	4.747	4.747	
160 E	TNGT	151	-124	12	-1176	157	8968	507.	1.000	1.000	1.000	B31S7
165		-151	652	-12	1176	-190	-10030	566.	1.000	1.000	1.000	
165	TNGT	151	3314	12	-1176	190	10030	566.	1.000	1.000	1.000	B31S7
165A		-151	-2216	-12	1176	-258	5695	326.	1.000	1.000	1.000	
165A	TNGT	151	2216	12	-1176	258	-5695	326.	1.000	1.000	1.000	B31S7
165B		-151	-1118	-12	1176	-326	15175	853.	1.000	1.000	1.000	
165B	TNGT	151	1118	12	-1176	326	-15175	853.	1.000	1.000	1.000	B31S7
165C		-151	-20	-12	1176	-394	18409	1033.	1.000	1.000	1.000	
165C	TNGT	151	-12	20	-1176	18409	394	1033.	1.000	1.000	1.000	B31S7
170		-151	12	1079	1176	-15397	-461	948.	1.461	1.000	1.000	
170	TNGT	151	81	-1861	-1337	15128	947	934.	1.461	1.000	1.000	B31S7
175		-151	-81	2247	1337	-11020	-784	935.	2.000	1.000	1.000	
175	TNGT	151	-2247	-81	-1337	784	-11020	1937.	2.000	1.000	1.000	B31S7
180		-151	2950	81	1337	-323	-3706	459.	1.000	1.000	1.000	

Calc 1-1 R1
App. 2, p. 48

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
180	TNGT	151	864	-81	-1337	323	3706	459.	1.000	1.000	1.000	B31S73
230 B		-151	-420	81	1337	-32	-1406	225.	1.000	1.000	1.000	
230 B	BEND	151	-81	-420	-1337	1406	-32	301.	1.782	4.598	4.598	B31S73
230 M		-49	164	249	137	-1531	-146	240.	1.782	4.598	4.598	
230 M	BEND	49	-164	-249	-137	1531	146	240.	1.782	4.598	4.598	B31S73
230 E		81	151	79	-888	-982	-374	213.	1.782	4.598	4.598	
230 E	TNGT	-81	79	-151	888	-374	982	160.	1.000	1.000	1.000	B31S73
230A		81	241	151	-888	762	-1191	194.	1.000	1.000	1.000	
230A	TNGT	-81	-241	-151	888	-762	1191	194.	1.000	1.000	1.000	B31S73
235 B		81	560	151	-888	1150	-2220	308.	1.000	1.000	1.000	
235 B	BEND	-81	560	151	888	1150	-2220	412.	1.782	4.598	4.598	B31S73
235 M		-459	-574	-151	-1519	-372	3055	532.	1.782	4.598	4.598	
235 M	BEND	459	574	151	1519	372	-3055	532.	1.782	4.598	4.598	B31S73
235 E		-901	-81	-151	-1414	624	3559	602.	1.782	4.598	4.598	
235 E	TNGT	901	-81	-151	1414	624	3559	450.	1.000	1.000	1.000	B31S73
D90		-1242	81	151	-1414	-210	-3783	520.	1.871	1.000	1.000	
115	TNGT	-41	149	390	-2315	7162	1292	469.	1.461	1.000	1.000	B31S73
240		41	-149	-3	2315	-7555	-993	669.	2.000	1.000	1.000	
240	TNGT	-41	3	-149	-2315	993	-7555	1386.	2.000	1.000	1.000	B31S73
240A		41	570	149	2315	-303	6244	774.	1.000	1.000	1.000	
240A	TNGT	-41	-570	-149	-2315	303	-6244	774.	1.000	1.000	1.000	B31S73
245 B		41	1144	149	2315	388	2279	380.	1.000	1.000	1.000	
245 B	BEND	-41	-149	1144	-2315	-2279	388	508.	1.782	4.598	4.598	B31S73
245 M		134	77	-1315	2633	-1552	-552	482.	1.782	4.598	4.598	
245 M	BEND	-134	-77	1315	-2633	1552	552	482.	1.782	4.598	4.598	B31S73
245 E		149	-41	-1485	60	-4697	-579	734.	1.782	4.598	4.598	
245 E	TNGT	-149	-1485	41	-60	-579	4697	549.	1.000	1.000	1.000	B31S73
250		149	1723	-41	60	501	-7771	904.	1.000	1.000	1.000	
250	TNGT	-149	1616	41	-60	-501	7771	904.	1.000	1.000	1.000	B31S73
255 B		149	-905	-41	60	268	-549	71.	1.000	1.000	1.000	
255 B	BEND	-149	-905	-41	-60	268	-549	95.	1.782	4.598	4.598	B31S73
255 M		625	414	41	-126	-182	-395	70.	1.782	4.598	4.598	
255 M	BEND	-625	-414	-41	126	182	395	70.	1.782	4.598	4.598	B31S73
255 E		564	-149	41	-197	11	-558	92.	1.782	4.598	4.598	

CALC. 1-1 R-1
ATT. 2, P. 49

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
255 E	TNGT	-564	-149	41	197	11	-558	69.	1.000	1.000	1.000	B31S73
C90		461	149	-41	-197	-44	433	61.	1.871	1.000	1.000	
170	TNGT	93	0	783	-269	161	-485	59.	1.461	1.000	1.000	B31S73
170A		-93	0	-167	269	-2517	486	299.	1.000	1.000	1.000	
170A	TNGT	93	167	0	-269	-486	-2517	299.	1.000	1.000	1.000	B31S73
170B		-93	449	0	269	486	1815	220.	1.000	1.000	1.000	
170B	TNGT	93	-449	0	-269	-486	-1815	220.	1.000	1.000	1.000	B31S73
260 B		-93	1065	0	269	486	-1946	235.	1.000	1.000	1.000	
260 B	BEND	93	1065	0	-269	486	-1946	314.	1.782	4.598	4.598	B31S73
260 M		-940	-808	0	-153	-534	3317	522.	1.782	4.598	4.598	
260 M	BEND	940	808	0	153	534	-3317	522.	1.782	4.598	4.598	B31S73
260 E		-1406	93	0	-486	-269	3865	606.	1.782	4.598	4.598	
260 E	TNGT	1406	93	0	486	-269	3865	453.	1.000	1.000	1.000	B31S73
B90		-1748	-93	0	-486	270	-3608	469.	1.871	1.000	1.000	
B97	TNGT	128	-23920	1	-34666	-9242	51893	228.	1.000	1.000	1.000	B31S73
S01		-128	23920	-1	34666	9240	-129634	486.	1.000	1.000	1.000	
S01	TNGT	-1010	-23899	2	-36608	-7507	129211	486.	1.000	1.000	1.000	B31S73
A97		1010	23899	-2	36608	7500	-212960	781.	1.000	1.000	1.000	
C97	TNGT	122	115615	-238	-1853	-7879	78404	285.	1.000	1.000	1.000	B31S73
MS2		-122	-115615	238	1853	8654	297343	1074.	1.000	1.000	1.000	
MS2	TNGT	6363	113801	252	-38692	10800	294750	1074.	1.000	1.000	1.000	B31S73
B97		-6363	-113801	-252	38692	-11563	49905	232.	1.000	1.000	1.000	
D97	TNGT	100	26609	-226	-18168	-7749	244521	886.	1.000	1.000	1.000	B31S73
S00		-100	-26609	226	18168	8485	-158040	575.	1.000	1.000	1.000	
S00	TNGT	1382	26574	-214	-35490	-6815	155154	575.	1.000	1.000	1.000	B31S73
C97		-1382	-26574	214	35490	7570	-61494	258.	1.000	1.000	1.000	
A07	TNGT	4733	0	0	0	0	0	0.	7.400	1.000	1.000	B31S73
AR5		-5360	0	0	0	0	0	0.	1.000	1.000	1.000	
B07	TNGT	3970	0	0	0	0	0	0.	7.400	1.000	1.000	B31S73
BR5		-4597	0	0	0	0	0	0.	1.000	1.000	1.000	
C07	TNGT	3199	0	0	0	0	0	0.	7.400	1.000	1.000	B31S73
CR5		-3825	0	0	0	0	0	0.	1.000	1.000	1.000	
D07	TNGT	3217	0	0	0	0	0	0.	7.400	1.000	1.000	B31S73
DR5		-3844	0	0	0	0	0	0.	1.000	1.000	1.000	

*** AT THE MEMBER END ASV OF ELEMENT FROM A95A TO ASV , MAX. STRESS (PSI) IS 2506.

Calc. 1-1 R.1
A(1-2), p.50

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE : WT02

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A05	TNGT	4	-10129	9	-653	-433	-27399	703.	1.080	1.000	1.000	B31S73
A06		-4	8804	-9	653	393	-16776	430.	1.000	1.000	1.000	
A06	TNGT	4	1271	9	-653	-393	16776	430.	1.000	1.000	1.000	B31S73
A07		-4	-3495	-9	653	326	1894	289.	7.400	1.000	1.000	
A07	TNGT	1943	4	9	326	-653	-1894	289.	7.400	1.000	1.000	B31S73
A07A		-768	-4	-9	-326	617	1910	52.	1.000	1.000	1.000	
A07A	TNGT	768	4	9	326	-617	-1910	52.	1.000	1.000	1.000	B31S73
A07B		407	-4	-9	-326	582	1926	52.	1.000	1.000	1.000	
A07B	TNGT	-407	4	9	326	-582	-1926	52.	1.000	1.000	1.000	B31S73
A10 B		1583	-4	-9	-326	546	1942	52.	1.000	1.000	1.000	
A10 B	BEND	-1583	4	9	326	-546	-1942	93.	2.356	6.986	6.986	B31S73
A10 M		1629	-1634	-9	148	597	3912	179.	2.356	6.986	6.986	
A10 M	BEND	-1629	1634	9	-148	-597	-3912	179.	2.356	6.986	6.986	B31S73
A10 E		-4	-3032	-9	518	298	10096	458.	2.356	6.986	6.986	
A10 E	TNGT	4	3032	9	-518	-298	-10096	259.	1.000	1.000	1.000	B31S73
A15		-4	-3588	-9	518	281	16578	425.	1.000	1.000	1.000	
A15	TNGT	4	-4670	9	-518	-281	-16578	425.	1.000	1.000	1.000	B31S73
A15A		-4	2486	-9	518	216	-10941	281.	1.000	1.000	1.000	
A15A	TNGT	4	-2486	9	-518	-216	10941	281.	1.000	1.000	1.000	B31S73
A15B		-4	302	-9	518	150	-21665	555.	1.000	1.000	1.000	
A15B	TNGT	4	-302	9	-518	-150	21665	555.	1.000	1.000	1.000	B31S73
A15C		-4	-1881	-9	518	84	-15593	400.	1.000	1.000	1.000	
A15C	TNGT	4	1881	9	-518	-84	15593	400.	1.000	1.000	1.000	B31S73
A20		-4	-4065	-9	518	18	7275	187.	1.000	1.000	1.000	
A20	TNGT	4	-1910	9	-518	-18	-7275	187.	1.000	1.000	1.000	B31S73
A25		-4	1311	-9	518	0	3878	100.	1.000	1.000	1.000	
A25	TNGT	4	-1311	9	-518	0	-3878	100.	1.000	1.000	1.000	B31S73
A30 B		-4	601	-9	518	-21	1488	40.	1.000	1.000	1.000	
A30 B	BEND	4	9	601	-518	-1488	-21	71.	2.356	6.986	6.986	B31S73
A30 M		-9	-3	124	1081	183	37	50.	2.356	6.986	6.986	

CALC. 1-1 / 1
APP. 2, P. 51

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A30 M	BEND	9	3	-124	-1081	-183	-37	50.	2.356	6.986	6.986	B31S73
A30 E		-9	4	848	1246	527	37	61.	2.356	6.986	6.986	
A30 E	TNGT	9	-848	4	-1246	-37	527	35.	1.000	1.000	1.000	B31S73
A35		-9	1804	-4	1246	24	-4988	132.	1.000	1.000	1.000	
A35	TNGT	9	357	4	-1246	-24	4988	132.	1.000	1.000	1.000	B31S73
A35A		-9	902	-4	1246	7	-6197	162.	1.000	1.000	1.000	
A35A	TNGT	9	-902	4	-1246	-7	6197	162.	1.000	1.000	1.000	B31S73
A35B		-9	2161	-4	1246	-10	-12989	334.	1.000	1.000	1.000	
A35B	TNGT	9	-2161	4	-1246	10	12989	334.	1.000	1.000	1.000	B31S73
A40		-9	3420	-4	1246	-27	-25362	651.	1.000	1.000	1.000	
A40	TNGT	9	5113	4	-1246	27	25362	651.	1.000	1.000	1.000	B31S73
A40A		-9	-3322	-4	1246	-51	1232	45.	1.000	1.000	1.000	
A40A	TNGT	9	3322	4	-1246	51	-1232	45.	1.000	1.000	1.000	B31S73
A40B		-9	-1532	-4	1246	-76	16537	425.	1.000	1.000	1.000	
A40B	TNGT	9	1532	4	-1246	76	-16537	425.	1.000	1.000	1.000	B31S73
A40C		-9	258	-4	1246	-100	20554	528.	1.000	1.000	1.000	
A40C	TNGT	9	-258	4	-1246	100	-20554	528.	1.000	1.000	1.000	B31S73
A40D		-9	2048	-4	1246	-124	13282	342.	1.000	1.000	1.000	
A40D	TNGT	9	-2048	4	-1246	124	-13282	342.	1.000	1.000	1.000	B31S73
A40E		-9	3839	-4	1246	-148	-5277	139.	1.000	1.000	1.000	
A40E	TNGT	9	-3839	4	-1246	148	5277	139.	1.000	1.000	1.000	B31S73
A45		-9	5629	-4	1246	-172	-35126	901.	1.000	1.000	1.000	
A45	TNGT	9	5315	4	-1246	172	35126	901.	1.000	1.000	1.000	B31S73
A45A		-9	-3521	-4	1246	-197	-7205	187.	1.000	1.000	1.000	
A45A	TNGT	9	3521	4	-1246	197	7205	187.	1.000	1.000	1.000	B31S73
A45B		-9	-1727	-4	1246	-221	9377	243.	1.000	1.000	1.000	
A45B	TNGT	9	1727	4	-1246	221	-9377	243.	1.000	1.000	1.000	B31S73
A45C		-9	67	-4	1246	-245	14621	376.	1.000	1.000	1.000	
A45C	TNGT	9	-67	4	-1246	245	-14621	376.	1.000	1.000	1.000	B31S73
A45D		-9	1861	-4	1246	-269	8527	221.	1.000	1.000	1.000	
A45D	TNGT	9	-1861	4	-1246	269	-8527	221.	1.000	1.000	1.000	B31S73
A45E		-9	3656	-4	1246	-294	-8905	231.	1.000	1.000	1.000	
A45E	TNGT	9	-3656	4	-1246	294	8905	231.	1.000	1.000	1.000	B31S73
A50		-9	5450	-4	1246	-318	-37675	966.	1.000	1.000	1.000	

Calc. 1-1 Rev. 2, p. 52

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A50	TNGT	9	5902	4	-1246	318	37675	966.	1.000	1.000	1.000	B31S73
A50A		-9	-4109	-4	1246	-342	-6061	159.	1.000	1.000	1.000	
A50A	TNGT	9	4109	4	-1246	342	6061	159.	1.000	1.000	1.000	B31S73
A50B		-9	-2316	-4	1246	-366	14226	366.	1.000	1.000	1.000	
A50B	TNGT	9	2316	4	-1246	366	-14226	366.	1.000	1.000	1.000	B31S73
A50C		-9	-522	-4	1246	-391	23188	595.	1.000	1.000	1.000	
A50C	TNGT	9	522	4	-1246	391	-23188	595.	1.000	1.000	1.000	B31S73
A50D		-9	1271	-4	1246	-415	20825	535.	1.000	1.000	1.000	
A50D	TNGT	9	-1271	4	-1246	415	-20825	535.	1.000	1.000	1.000	B31S73
A50E		-9	3064	-4	1246	-439	7135	186.	1.000	1.000	1.000	
A50E	TNGT	9	-3064	4	-1246	439	-7135	186.	1.000	1.000	1.000	B31S73
A55		-9	4857	-4	1246	-463	-17880	460.	1.000	1.000	1.000	
A55	TNGT	9	3310	4	-1246	463	17880	460.	1.000	1.000	1.000	B31S73
A60		-9	-1447	-4	1246	-489	-2273	68.	1.000	1.000	1.000	
A60	TNGT	9	1447	4	-1246	489	2273	68.	1.000	1.000	1.000	B31S73
A65 B		-9	239	-4	1246	-511	1311	48.	1.000	1.000	1.000	
A65 B	BEND	9	4	239	-1246	-1311	-511	85.	2.356	6.986	6.986	B31S73
A65 M		-9	3	-964	1346	-1382	512	90.	2.356	6.986	6.986	
A65 M	BEND	9	-3	964	-1346	1382	-512	90.	2.356	6.986	6.986	B31S73
A65 E		-4	9	-1689	-1178	-5022	496	235.	2.356	6.986	6.986	
A65 E	TNGT	4	1689	9	1178	-496	-5022	133.	1.000	1.000	1.000	B31S73
A65A		-4	-2785	-9	-1178	463	13661	352.	1.000	1.000	1.000	
A65A	TNGT	4	2785	9	1178	-463	-13661	352.	1.000	1.000	1.000	B31S73
A70		-4	-3882	-9	-1178	430	26534	681.	1.000	1.000	1.000	
A70	TNGT	4	-5094	9	1178	-430	-26534	681.	1.000	1.000	1.000	B31S73
A70A		-4	3324	-9	-1178	377	294	33.	1.000	1.000	1.000	
A70A	TNGT	4	-3324	9	1178	-377	-294	33.	1.000	1.000	1.000	B31S73
A70B		-4	1554	-9	-1178	323	-14911	383.	1.000	1.000	1.000	
A70B	TNGT	4	-1554	9	1178	-323	14911	383.	1.000	1.000	1.000	B31S73
A70C		-4	-216	-9	-1178	270	-19080	490.	1.000	1.000	1.000	
A70C	TNGT	4	216	9	1178	-270	19080	490.	1.000	1.000	1.000	B31S73
A70D		-4	-1986	-9	-1178	216	-12216	315.	1.000	1.000	1.000	
A70D	TNGT	4	1986	9	1178	-216	12216	315.	1.000	1.000	1.000	B31S73
A75		-4	-3756	-9	-1178	163	5685	149.	1.000	1.000	1.000	

Calc. 1-1 R. 1
App. 2, P. 53

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A75	TNGT	4	-3690	9	1178	-163	-5685	149.	1.000	1.000	1.000	B31S73
A75A		-4	1973	-9	-1178	111	-11439	295.	1.000	1.000	1.000	
A75A	TNGT	4	-1973	9	1178	-111	11439	295.	1.000	1.000	1.000	B31S73
A75B		-4	257	-9	-1178	59	-18181	467.	1.000	1.000	1.000	
A75B	TNGT	4	-257	9	1178	-59	18181	467.	1.000	1.000	1.000	B31S73
A75C		-4	-1460	-9	-1178	8	-14542	374.	1.000	1.000	1.000	
A75C	TNGT	4	1460	9	1178	-8	14542	374.	1.000	1.000	1.000	B31S73
A80		-4	-3177	-9	-1178	-44	-522	33.	1.000	1.000	1.000	
A80	TNGT	4	-1019	9	1178	44	522	33.	1.000	1.000	1.000	B31S73
A80A		-4	-823	-9	-1178	-100	-1159	42.	1.000	1.000	1.000	
A80A	TNGT	4	823	9	1178	100	1159	42.	1.000	1.000	1.000	B31S73
A85		-4	-2664	-9	-1178	-155	10151	262.	1.000	1.000	1.000	
A85	TNGT	4	-2646	9	1178	155	-10151	262.	1.000	1.000	1.000	B31S73
A88 B		-4	2307	-9	-1178	-165	7197	187.	1.000	1.000	1.000	
A88 B	BEND	4	-9	-2307	1178	7197	165	330.	2.356	6.986	6.986	B31S73
A88 M		3	9	1582	-3961	167	-189	180.	2.356	6.986	6.986	
A88 M	BEND	-3	-9	-1582	3961	-167	189	180.	2.356	6.986	6.986	B31S73
A88 E		9	4	858	-1411	5677	-206	265.	2.356	6.986	6.986	
A88 E	TNGT	-9	-858	4	1411	206	5677	150.	1.000	1.000	1.000	B31S73
A90		9	396	-4	-1411	-212	-6695	246.	1.871	1.000	1.000	
A90	TNGT	-60	-882	60	2112	-483	5472	212.	1.871	1.000	1.000	B31S73
A90A		60	-1293	-60	-2112	21	-3899	114.	1.000	1.000	1.000	
A90A	TNGT	-60	1293	60	2112	-21	3899	114.	1.000	1.000	1.000	B31S73
A95		60	-3467	-60	-2112	-441	14328	371.	1.000	1.000	1.000	
A95	TNGT	-60	-2056	60	2112	441	-14328	371.	1.000	1.000	1.000	B31S73
A95A		60	859	-60	-2112	-696	8183	217.	1.000	1.000	1.000	
A95A	TNGT	-60	-859	60	2112	696	-8183	217.	1.000	1.000	1.000	B31S73
ASV		60	-338	-60	-2112	-950	7085	191.	1.000	1.000	1.000	
ASV	TNGT	-60	338	60	2112	950	-7085	27.	1.000	1.000	1.000	B31S73
A97		60	-1475	-60	-2112	-1191	10710	40.	1.000	1.000	1.000	
A97	TNGT	0	72364	0	0	0	264149	954.	1.000	1.000	1.000	B31S73
MS1		0	-73393	0	0	0	36	0.	1.000	1.000	1.000	
MS1	TNGT	0	-142	0	0	0	-36	0.	1.000	1.000	1.000	B31S73
S02		0	0	0	0	0	0	0.	1.000	1.000	1.000	

Calc. 1-1 R. App. 2, P. 54

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
A97	TNGT	-15335	-12378	244	-1164	-9190	-27161	190.	1.000	1.000	1.000	B31S7
GA1		12877	10364	-244	1164	6466	-99933	662.	1.000	1.000	1.000	
GA1	TNGT	0	42699	0	0	0	117138	774.	1.000	1.000	1.000	B31S7
CV1		0	-43472	0	0	0	0	0.	1.000	1.000	1.000	
GA1	TNGT	-14528	-244	143	-4998	17204	-4264	315.	1.000	1.000	1.000	B31S7
GA1A		12363	244	-143	4998	-18002	2908	323.	1.000	1.000	1.000	
GA1A	TNGT	-12363	-244	143	-4998	18002	-2908	323.	1.000	1.000	1.000	B31S7
GA1B		10198	244	-143	4998	-18801	1553	333.	1.000	1.000	1.000	
GA1B	TNGT	-10198	-244	143	-4998	18801	-1553	333.	1.000	1.000	1.000	B31S7
GA2 B		8033	244	-143	4998	-19599	197	346.	1.000	1.000	1.000	
GA2 B	BEND	-8033	-152	-238	-4998	924	19578	528.	2.038	5.622	5.622	B31S7
GA2 M		5032	-4816	238	3125	-3598	-12443	348.	2.038	5.622	5.622	
GA2 M	BEND	-5032	4816	-238	-3125	3598	12443	348.	2.038	5.622	5.622	B31S7
GA2 E		152	-5894	238	-90	-4164	3238	138.	2.038	5.622	5.622	
GA2 E	TNGT	-152	-5894	238	90	-4164	3238	90.	1.000	1.000	1.000	B31S7
GA2A		152	4016	-238	-90	3015	-27138	466.	1.000	1.000	1.000	
GA2A	TNGT	-152	-4016	238	90	-3015	27138	466.	1.000	1.000	1.000	B31S7
GA2B		152	2139	-238	-90	1866	-41983	718.	1.000	1.000	1.000	
GA2B	TNGT	-152	-2139	238	90	-1866	41983	718.	1.000	1.000	1.000	B31S7
GA2C		152	262	-238	-90	717	-47773	816.	1.000	1.000	1.000	
GA2C	TNGT	-152	-262	238	90	-717	47773	816.	1.000	1.000	1.000	B31S7
GA2D		152	-1616	-238	-90	-432	-44508	760.	1.000	1.000	1.000	
GA2D	TNGT	-152	1616	238	90	432	44508	760.	1.000	1.000	1.000	B31S7
GA2E		152	-3493	-238	-90	-1581	-32188	550.	1.000	1.000	1.000	
GA2E	TNGT	-152	3493	238	90	1581	32188	550.	1.000	1.000	1.000	B31S7
GA4 B		152	-5370	-238	-90	-2731	-10812	190.	1.000	1.000	1.000	
GA4 B	BEND	-152	-5370	-238	90	-2731	-10812	291.	2.038	5.622	5.622	B31S7
GA4 M		4662	4446	238	2111	2584	-3573	128.	2.038	5.622	5.622	
GA4 M	BEND	-4662	-4446	-238	-2111	-2584	3573	128.	2.038	5.622	5.622	B31S7
GA4 E		7510	-152	238	3564	924	-10171	282.	2.038	5.622	5.622	
GA4 E	TNGT	-7510	244	143	-3564	-10198	-546	185.	1.000	1.000	1.000	B31S7
GA4A		9711	-244	-143	3564	9387	1924	175.	1.000	1.000	1.000	
GA4A	TNGT	-9711	244	143	-3564	-9387	-1924	175.	1.000	1.000	1.000	B31S7
GA4B		11913	-244	-143	3564	8575	3303	168.	1.000	1.000	1.000	

Calc. 1-1 R.1
App. 2, P. 55

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
GA4B	TNGT	-11913	244	143	-3564	-8575	-3303	168.	1.000	1.000	1.000	B31S7
GA4C		14114	-244	-143	3564	7764	4681	166.	1.000	1.000	1.000	
GA4C	TNGT	-14114	244	143	-3564	-7764	-4681	166.	1.000	1.000	1.000	B31S7
GA4D		16315	-244	-143	3564	6952	6060	169.	1.000	1.000	1.000	
GA4D	TNGT	-16315	244	143	-3564	-6952	-6060	169.	1.000	1.000	1.000	B31S7
GA4E		18517	-244	-143	3564	6141	7438	176.	1.000	1.000	1.000	
GA4E	TNGT	-18517	244	143	-3564	-6141	-7438	176.	1.000	1.000	1.000	B31S7
GA4F		20718	-244	-143	3564	5329	8817	186.	1.000	1.000	1.000	
GA4F	TNGT	-20718	244	143	-3564	-5329	-8817	186.	1.000	1.000	1.000	B31S7
GA4G		22919	-244	-143	3564	4518	10195	200.	1.000	1.000	1.000	
GA4G	TNGT	-22919	244	143	-3564	-4518	-10195	200.	1.000	1.000	1.000	B31S7
GA5 B		25121	-244	-143	3564	3706	11574	216.	1.000	1.000	1.000	
GA5 B	BEND	-25121	-244	-143	-3564	3706	11574	433.	2.670	8.433	8.433	B31S7
GA5 M		18440	-18095	143	-2	-4904	5513	252.	2.670	8.433	8.433	
GA5 M	BEND	-18440	18095	-143	2	4904	-5513	252.	2.670	8.433	8.433	B31S7
GA5 E		244	-26547	143	-3371	-3230	48591	1670.	2.670	8.433	8.433	
GA5 E	TNGT	-244	-26547	143	3371	-3230	48591	834.	1.000	1.000	1.000	B31S7
GA6		244	26807	-143	-3371	3134	-66376	1137.	1.000	1.000	1.000	
B05	TNGT	5	-10371	13	-226	-650	-28283	725.	1.080	1.000	1.000	B31S7
B06		-5	9046	-13	226	587	-17024	437.	1.000	1.000	1.000	
B06	TNGT	5	1029	13	-226	-587	17024	437.	1.000	1.000	1.000	B31S7
B07		-5	-3253	-13	226	482	-255	84.	7.400	1.000	1.000	
B07	TNGT	1547	5	13	482	-226	255	84.	7.400	1.000	1.000	B31S7
B07A		-371	-5	-13	-482	170	-234	14.	1.000	1.000	1.000	
B07A	TNGT	371	5	13	482	-170	234	14.	1.000	1.000	1.000	B31S7
B07B		804	-5	-13	-482	114	-212	14.	1.000	1.000	1.000	
B07B	TNGT	-804	5	13	482	-114	212	14.	1.000	1.000	1.000	B31S7
B10 B		1979	-5	-13	-482	58	-191	13.	1.000	1.000	1.000	
B10 B	BEND	-1979	5	13	482	-58	191	24.	2.356	6.986	6.986	B31S7
B10 M		1908	-1915	-13	-312	351	2160	100.	2.356	6.986	6.986	
B10 M	BEND	-1908	1915	13	312	-351	-2160	100.	2.356	6.986	6.986	B31S7
B10 E		-5	-3428	-13	14	438	9255	420.	2.356	6.986	6.986	
B10 E	TNGT	5	3428	13	-14	-438	-9255	237.	1.000	1.000	1.000	B31S7
B15		-5	-3988	-13	14	411	16576	425.	1.000	1.000	1.000	

Calc. 1-1 R.1
App. 2, p. 56

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
B15	TNGT	5	-4262	13	-14	-411	-16576	425.	1.000	1.000	1.000	B31S7
B15A		-5	2043	-13	14	306	-8057	207.	1.000	1.000	1.000	
B15A	TNGT	5	-2043	13	-14	-306	8057	207.	1.000	1.000	1.000	B31S7
B15B		-5	-175	-13	14	200	-15356	394.	1.000	1.000	1.000	
B15B	TNGT	5	175	13	-14	-200	15356	394.	1.000	1.000	1.000	B31S7
B15C		-5	-2394	-13	14	95	-5320	136.	1.000	1.000	1.000	
B15C	TNGT	5	2394	13	-14	-95	5320	136.	1.000	1.000	1.000	B31S7
B20		-5	-4612	-13	14	-11	22051	565.	1.000	1.000	1.000	
B20	TNGT	5	-3638	13	-14	11	-22051	565.	1.000	1.000	1.000	B31S7
B25		-5	1881	-13	14	-94	4978	128.	1.000	1.000	1.000	
B25	TNGT	5	-1881	13	-14	94	-4978	128.	1.000	1.000	1.000	B31S7
B30 B		-5	1384	-13	14	-118	2121	54.	1.000	1.000	1.000	
B30 B	BEND	5	13	1384	-14	-2121	-118	96.	2.356	6.986	6.986	B31S7
B30 M		-13	-6	-659	427	-813	144	42.	2.356	6.986	6.986	
B30 M	BEND	13	6	659	-427	813	-144	42.	2.356	6.986	6.986	B31S7
B30 E		-13	5	65	-666	-1514	145	75.	2.356	6.986	6.986	
B30 E	TNGT	13	-65	5	666	-145	-1514	43.	1.000	1.000	1.000	B31S7
B30A		-13	887	-5	-666	130	137	18.	1.000	1.000	1.000	
B30A	TNGT	13	-887	5	666	-130	-137	18.	1.000	1.000	1.000	B31S7
B35		-13	1708	-5	-666	115	-3617	94.	1.000	1.000	1.000	
B35	TNGT	13	597	5	666	-115	3617	94.	1.000	1.000	1.000	B31S7
B35A		-13	1368	-5	-666	79	-6287	162.	1.000	1.000	1.000	
B35A	TNGT	13	-1368	5	666	-79	6287	162.	1.000	1.000	1.000	B31S7
B40		-13	3333	-5	-666	43	-22559	578.	1.000	1.000	1.000	
B40	TNGT	13	4825	5	666	-43	22559	578.	1.000	1.000	1.000	B31S7
B40A		-13	-3126	-5	-666	12	1232	36.	1.000	1.000	1.000	
B40A	TNGT	13	3126	5	666	-12	-1232	36.	1.000	1.000	1.000	B31S7
B40B		-13	-1427	-5	-666	-19	14856	381.	1.000	1.000	1.000	
B40B	TNGT	13	1427	5	666	19	-14856	381.	1.000	1.000	1.000	B31S7
B40C		-13	272	-5	-666	-50	18312	470.	1.000	1.000	1.000	
B40C	TNGT	13	-272	5	666	50	-18312	470.	1.000	1.000	1.000	B31S7
B40D		-13	1971	-5	-666	-80	11600	298.	1.000	1.000	1.000	
B40D	TNGT	13	-1971	5	666	80	-11600	298.	1.000	1.000	1.000	B31S7
B40E		-13	3670	-5	-666	-111	-5279	136.	1.000	1.000	1.000	

Calc. 1-1 R.1
App. 2, P. 57

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
B40E	TNGT	13	-3670	5	666	111	5279	136.	1.000	1.000	1.000	B31S7
B45		-13	5369	-5	-666	-142	-32327	829.	1.000	1.000	1.000	
B45	TNGT	13	5142	5	666	142	32327	829.	1.000	1.000	1.000	B31S7
B45A		-13	-3348	-5	-666	-175	-5507	142.	1.000	1.000	1.000	
B45A	TNGT	13	3348	5	666	175	5507	142.	1.000	1.000	1.000	B31S7
B45B		-13	-1555	-5	-666	-208	9980	256.	1.000	1.000	1.000	
B45B	TNGT	13	1555	5	666	208	-9980	256.	1.000	1.000	1.000	B31S7
B45C		-13	239	-5	-666	-240	14136	363.	1.000	1.000	1.000	
B45C	TNGT	13	-239	5	666	240	-14136	363.	1.000	1.000	1.000	B31S7
B45D		-13	2033	-5	-666	-273	6959	179.	1.000	1.000	1.000	
B45D	TNGT	13	-2033	5	666	273	-6959	179.	1.000	1.000	1.000	B31S7
B45E		-13	3826	-5	-666	-306	-11549	297.	1.000	1.000	1.000	
B45E	TNGT	13	-3826	5	666	306	11549	297.	1.000	1.000	1.000	B31S7
B50		-13	5620	-5	-666	-338	-41389	1061.	1.000	1.000	1.000	
B50	TNGT	13	6326	5	666	338	41389	1061.	1.000	1.000	1.000	B31S7
B50A		-13	-4533	-5	-666	-371	-7090	183.	1.000	1.000	1.000	
B50A	TNGT	13	4533	5	666	371	7090	183.	1.000	1.000	1.000	B31S7
B50B		-13	-2740	-5	-666	-404	15879	407.	1.000	1.000	1.000	
B50B	TNGT	13	2740	5	666	404	-15879	407.	1.000	1.000	1.000	B31S7
B50C		-13	-946	-5	-666	-436	27520	706.	1.000	1.000	1.000	
B50C	TNGT	13	946	5	666	436	-27520	706.	1.000	1.000	1.000	B31S7
B50D		-13	847	-5	-666	-469	27832	714.	1.000	1.000	1.000	
B50D	TNGT	13	-847	5	666	469	-27832	714.	1.000	1.000	1.000	B31S7
B50E		-13	2641	-5	-666	-502	16816	432.	1.000	1.000	1.000	
B50E	TNGT	13	-2641	5	666	502	-16816	432.	1.000	1.000	1.000	B31S7
B55		-13	4434	-5	-666	-534	-5530	143.	1.000	1.000	1.000	
B55	TNGT	13	2625	5	666	534	5530	143.	1.000	1.000	1.000	B31S7
B60		-13	1033	-5	-666	-601	4729	123.	1.000	1.000	1.000	
B60	TNGT	13	-1033	5	666	601	-4729	123.	1.000	1.000	1.000	B31S7
B65 B		-13	1583	-5	-666	-611	2195	61.	1.000	1.000	1.000	
B65 B	BEND	13	5	1583	666	-2195	-611	107.	2.356	6.986	6.986	B31S7
B65 M		-13	6	-2308	-661	-2494	610	120.	2.356	6.986	6.986	
B65 M	BEND	13	-6	2308	661	2494	-610	120.	2.356	6.986	6.986	B31S7
B65 E		-5	13	-3032	-4662	-7478	584	400.	2.356	6.986	6.986	

Calc. 1-1 R-1
AIP-2, P. 58

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
B65 E	TNGT	5	3032	13	4662	-584	-7478	226.	1.000	1.000	1.000	B31S7
B70		-5	-4283	-13	-4662	524	23596	617.	1.000	1.000	1.000	
B70	TNGT	5	-4105	13	4662	-524	-23596	617.	1.000	1.000	1.000	B31S7
B70A		-5	2362	-13	-4662	441	3752	154.	1.000	1.000	1.000	
B70A	TNGT	5	-2362	13	4662	-441	-3752	154.	1.000	1.000	1.000	B31S7
B70B		-5	620	-13	-4662	359	-5398	183.	1.000	1.000	1.000	
B70B	TNGT	5	-620	13	4662	-359	5398	183.	1.000	1.000	1.000	B31S7
B70C		-5	-1123	-13	-4662	276	-3853	155.	1.000	1.000	1.000	
B70C	TNGT	5	1123	13	4662	-276	3853	155.	1.000	1.000	1.000	B31S7
B70D		-5	-2866	-13	-4662	193	8387	246.	1.000	1.000	1.000	
B70D	TNGT	5	2866	13	4662	-193	-8387	246.	1.000	1.000	1.000	B31S7
B75		-5	-4608	-13	-4662	110	31321	812.	1.000	1.000	1.000	
B75	TNGT	5	-5183	13	4662	-110	-31321	812.	1.000	1.000	1.000	B31S7
B75A		-5	3007	-13	-4662	7	-66	119.	1.000	1.000	1.000	
B75A	TNGT	5	-3007	13	4662	-7	66	119.	1.000	1.000	1.000	B31S7
B75B		-5	830	-13	-4662	-97	-14771	397.	1.000	1.000	1.000	
B75B	TNGT	5	-830	13	4662	97	14771	397.	1.000	1.000	1.000	B31S7
B75C		-5	-1346	-13	-4662	-200	-12794	349.	1.000	1.000	1.000	
B75C	TNGT	5	1346	13	4662	200	12794	349.	1.000	1.000	1.000	B31S7
B80		-5	-3522	-13	-4662	-304	5864	192.	1.000	1.000	1.000	
B80	TNGT	5	-2342	13	4662	304	-5864	192.	1.000	1.000	1.000	B31S7
B85 B		-5	2012	-13	-4662	-319	3336	147.	1.000	1.000	1.000	
B85 B	BEND	5	-13	-2012	4662	3336	319	260.	2.356	6.986	6.986	B31S7
B85 M		6	13	1287	-3975	4683	-355	279.	2.356	6.986	6.986	
B85 M	BEND	-6	-13	-1287	3975	-4683	355	279.	2.356	6.986	6.986	B31S7
B85 E		13	5	562	1491	8202	-380	378.	2.356	6.986	6.986	
B85 E	TNGT	-13	-562	5	-1491	380	8202	214.	1.000	1.000	1.000	B31S7
B90		13	101	-5	1491	-388	-8741	319.	1.871	1.000	1.000	
B90	TNGT	25	1647	-34	-1643	576	14283	517.	1.871	1.000	1.000	B31S7
B90A		-25	-3253	34	1643	-385	-423	45.	1.000	1.000	1.000	
B90A	TNGT	25	3253	-34	-1643	385	423	45.	1.000	1.000	1.000	B31S7
B95		-25	-4859	34	1643	-194	22520	579.	1.000	1.000	1.000	
B95	TNGT	25	-772	-34	-1643	194	-22520	579.	1.000	1.000	1.000	B31S7
B95A		-25	-425	34	1643	-51	21787	560.	1.000	1.000	1.000	

Calc. 1-1 R.1
App 2, p. 59

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
B95A	TNGT	25	425	-34	-1643	51	-21787	560.	1.000	1.000	1.000	B31S7
BSV		-25	-1623	34	1643	91	26108	670.	1.000	1.000	1.000	
BSV	TNGT	25	1623	-34	-1643	-91	-26108	94.	1.000	1.000	1.000	B31S7
B97		-25	-2759	34	1643	227	34873	126.	1.000	1.000	1.000	
B97	TNGT	-16399	-13614	-2	-20	1307	-48908	323.	1.000	1.000	1.000	B31S7
GB1		13941	11600	2	20	-1280	-91998	608.	1.000	1.000	1.000	
GB1	TNGT	0	41045	0	0	0	112642	744.	1.000	1.000	1.000	B31S7
CV2		0	-41818	0	0	0	0	0.	1.000	1.000	1.000	
GB1	TNGT	-14480	2	-138	795	20644	1003	353.	1.000	1.000	1.000	B31S7
GB1A		12316	-2	138	-795	-19877	-990	340.	1.000	1.000	1.000	
GB1A	TNGT	-12316	2	-138	795	19877	990	340.	1.000	1.000	1.000	B31S7
GB1B		10151	-2	138	-795	-19109	-976	327.	1.000	1.000	1.000	
GB1B	TNGT	-10151	2	-138	795	19109	976	327.	1.000	1.000	1.000	B31S7
GB2 B		7986	-2	138	-795	-18341	-963	314.	1.000	1.000	1.000	
GB2 B	BEND	-7986	138	-2	795	-325	18364	480.	2.038	5.622	5.622	B31S7
GB2 M		4793	-4988	2	-330	798	-10559	277.	2.038	5.622	5.622	
GB2 M	BEND	-4793	4988	-2	330	-798	10559	277.	2.038	5.622	5.622	B31S7
GB2 E		-138	-5846	2	333	804	5302	140.	2.038	5.622	5.622	
GB2 E	TNGT	138	-5846	2	-333	804	5302	92.	1.000	1.000	1.000	B31S7
GB2A		-138	3969	-2	333	-815	-28972	495.	1.000	1.000	1.000	
GB2A	TNGT	138	-3969	2	-333	815	28972	495.	1.000	1.000	1.000	B31S7
GB2B		-138	2092	-2	333	-827	-43588	745.	1.000	1.000	1.000	
GB2B	TNGT	138	-2092	2	-333	827	43588	745.	1.000	1.000	1.000	B31S7
GB2C		-138	215	-2	333	-839	-49151	840.	1.000	1.000	1.000	
GB2C	TNGT	138	-215	2	-333	839	49151	840.	1.000	1.000	1.000	B31S7
GB2D		-138	-1662	-2	333	-850	-45661	780.	1.000	1.000	1.000	
GB2D	TNGT	138	1662	2	-333	850	45661	780.	1.000	1.000	1.000	B31S7
GB2E		-138	-3539	-2	333	-862	-33118	566.	1.000	1.000	1.000	
GB2E	TNGT	138	3539	2	-333	862	33118	566.	1.000	1.000	1.000	B31S7
GB4 B		-138	-5416	-2	333	-874	-11521	197.	1.000	1.000	1.000	
GB4 B	BEND	138	-5416	-2	-333	-874	-11521	302.	2.038	5.622	5.622	B31S7
GB4 M		4489	4684	2	856	388	-3277	89.	2.038	5.622	5.622	
GB4 M	BEND	-4489	-4684	-2	-856	-388	3277	89.	2.038	5.622	5.622	B31S7
GB4 E		7556	138	2	882	-325	-10641	279.	2.038	5.622	5.622	

Calc. 1-1 R.1
Att. 2, p. 50

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
GB4 E	TNGT	-7556	-2	-138	-882	-10623	695	182.	1.000	1.000	1.000	B31S7:
GB4A		9291	2	138	882	11238	-705	193.	1.000	1.000	1.000	
GB4A	TNGT	-9291	-2	-138	-882	-11238	705	193.	1.000	1.000	1.000	B31S7:
GB4B		11026	2	138	882	11854	-716	203.	1.000	1.000	1.000	
GB4B	TNGT	-11026	-2	-138	-882	-11854	716	203.	1.000	1.000	1.000	B31S7:
GB4C		12761	2	138	882	12469	-727	214.	1.000	1.000	1.000	
GB4C	TNGT	-12761	-2	-138	-882	-12469	727	214.	1.000	1.000	1.000	B31S7:
GB4D		14497	2	138	882	13084	-737	224.	1.000	1.000	1.000	
GB4D	TNGT	-14497	-2	-138	-882	-13084	737	224.	1.000	1.000	1.000	B31S7:
GB4E		16232	2	138	882	13699	-748	235.	1.000	1.000	1.000	
GB4E	TNGT	-16232	-2	-138	-882	-13699	748	235.	1.000	1.000	1.000	B31S7:
GB4F		17967	2	138	882	14315	-759	245.	1.000	1.000	1.000	
GB4F	TNGT	-17967	-2	-138	-882	-14315	759	245.	1.000	1.000	1.000	B31S7:
GB4G		19702	2	138	882	14930	-769	256.	1.000	1.000	1.000	
GB4G	TNGT	-19702	-2	-138	-882	-14930	769	256.	1.000	1.000	1.000	B31S7:
GB5		21437	2	138	882	15545	-780	266.	1.000	1.000	1.000	
C05	TNGT	6	-10604	16	-296	-788	-29132	747.	1.080	1.000	1.000	B31S7:
C06		-6	9279	-16	296	713	-17261	443.	1.000	1.000	1.000	
C06	TNGT	6	796	16	-296	-713	17261	443.	1.000	1.000	1.000	B31S7:
C07		-6	-3020	-16	296	586	-2315	342.	7.400	1.000	1.000	
C07	TNGT	1208	6	16	586	-296	2315	342.	7.400	1.000	1.000	B31S7:
C07A		-33	-6	-16	-586	229	-2291	61.	1.000	1.000	1.000	
C07A	TNGT	33	6	16	586	-229	2291	61.	1.000	1.000	1.000	B31S7:
C07B		1143	-6	-16	-586	162	-2266	60.	1.000	1.000	1.000	
C07B	TNGT	-1143	6	16	586	-162	2266	60.	1.000	1.000	1.000	B31S7:
C10 B		2318	-6	-16	-586	94	-2242	59.	1.000	1.000	1.000	
C10 B	BEND	-2318	6	16	586	-94	2242	105.	2.356	6.986	6.986	B31S7:
C10 M		2147	-2155	-16	-363	443	432	32.	2.356	6.986	6.986	
C10 M	BEND	-2147	2155	16	363	-443	-432	32.	2.356	6.986	6.986	B31S7:
C10 E		-6	-3767	-16	42	533	8308	377.	2.356	6.986	6.986	
C10 E	TNGT	6	3767	16	-42	-533	-8308	213.	1.000	1.000	1.000	B31S7:
C15		-6	-4325	-16	42	501	16252	417.	1.000	1.000	1.000	
C15	TNGT	6	-3918	16	-42	-501	-16252	417.	1.000	1.000	1.000	B31S7:
C15A		-6	2172	-16	42	401	-2481	64.	1.000	1.000	1.000	

Calc. 1-1 R.1
App. 2, p. 61

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
C15A	TNGT	6	-2172	16	-42	-401	2481	64.	1.000	1.000	1.000	B31S73
C15B		-6	425	-16	42	301	-10469	268.	1.000	1.000	1.000	
C15B	TNGT	6	-425	16	-42	-301	10469	268.	1.000	1.000	1.000	B31S73
C15C		-6	-1322	-16	42	201	-7711	198.	1.000	1.000	1.000	
C15C	TNGT	6	1322	16	-42	-201	7711	198.	1.000	1.000	1.000	B31S73
C15D		-6	-3068	-16	42	101	5792	148.	1.000	1.000	1.000	
C15D	TNGT	6	3068	16	-42	-101	-5792	148.	1.000	1.000	1.000	B31S73
C20		-6	-4815	-16	42	1	30041	770.	1.000	1.000	1.000	
C20	TNGT	6	-4120	16	-42	-1	-30041	770.	1.000	1.000	1.000	B31S73
C25		-6	824	-16	42	-187	1342	35.	1.000	1.000	1.000	
C25	TNGT	6	-824	16	-42	187	-1342	35.	1.000	1.000	1.000	B31S73
C30 B		-6	635	-16	42	-198	856	23.	1.000	1.000	1.000	
C30 B	BEND	6	16	635	-42	-856	-198	40.	2.356	6.986	6.986	B31S73
C30 M		-16	-7	90	265	-5	230	16.	2.356	6.986	6.986	
C30 M	BEND	16	7	-90	-265	5	-230	16.	2.356	6.986	6.986	B31S73
C30 E		-16	6	815	504	894	232	48.	2.356	6.986	6.986	
C30 E	TNGT	16	-815	6	-504	-232	894	27.	1.000	1.000	1.000	B31S73
C35		-16	2332	-6	504	200	-9301	239.	1.000	1.000	1.000	
C35	TNGT	16	3013	6	-504	-200	9301	239.	1.000	1.000	1.000	B31S73
C35A		-16	-1167	-6	504	163	4286	111.	1.000	1.000	1.000	
C35A	TNGT	16	1167	6	-504	-163	-4286	111.	1.000	1.000	1.000	B31S73
C35B		-16	679	-6	504	125	5873	151.	1.000	1.000	1.000	
C35B	TNGT	16	-679	6	-504	-125	-5873	151.	1.000	1.000	1.000	B31S73
C35C		-16	2525	-6	504	87	-4541	117.	1.000	1.000	1.000	
C35C	TNGT	16	-2525	6	-504	-87	4541	117.	1.000	1.000	1.000	B31S73
C40		-16	4370	-6	504	49	-26954	691.	1.000	1.000	1.000	
C40	TNGT	16	5104	6	-504	-49	26954	691.	1.000	1.000	1.000	B31S73
C40A		-16	-3313	-6	504	12	-413	17.	1.000	1.000	1.000	
C40A	TNGT	16	3313	6	-504	-12	413	17.	1.000	1.000	1.000	B31S73
C40B		-16	-1523	-6	504	-25	14837	381.	1.000	1.000	1.000	
C40B	TNGT	16	1523	6	-504	25	-14837	381.	1.000	1.000	1.000	B31S73
C40C		-16	268	-6	504	-62	18796	482.	1.000	1.000	1.000	
C40C	TNGT	16	-268	6	-504	62	-18796	482.	1.000	1.000	1.000	B31S73
C40D		-16	2058	-6	504	-99	11463	294.	1.000	1.000	1.000	

Calc. 1-1 R.1
App 2, p. 62

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
C40D	TNGT	16	-2058	6	-504	99	-11463	294.	1.000	1.000	1.000	B31S7
C40E		-16	3848	-6	504	-136	-7161	184.	1.000	1.000	1.000	
C40E	TNGT	16	-3848	6	-504	136	7161	184.	1.000	1.000	1.000	B31S7
C45		-16	5639	-6	504	-172	-37077	950.	1.000	1.000	1.000	
C45	TNGT	16	5617	6	-504	172	37077	950.	1.000	1.000	1.000	B31S7
C45A		-16	-3824	-6	504	-209	-7255	186.	1.000	1.000	1.000	
C45A	TNGT	16	3824	6	-504	209	7255	186.	1.000	1.000	1.000	B31S7
C45B		-16	-2030	-6	504	-246	11236	288.	1.000	1.000	1.000	
C45B	TNGT	16	2030	6	-504	246	-11236	288.	1.000	1.000	1.000	B31S7
C45C		-16	-236	-6	504	-283	18394	472.	1.000	1.000	1.000	
C45C	TNGT	16	236	6	-504	283	-18394	472.	1.000	1.000	1.000	B31S7
C45D		-16	1557	-6	504	-320	14221	365.	1.000	1.000	1.000	
C45D	TNGT	16	-1557	6	-504	320	-14221	365.	1.000	1.000	1.000	B31S7
C45E		-16	3351	-6	504	-357	-1284	37.	1.000	1.000	1.000	
C45E	TNGT	16	-3351	6	-504	357	1284	37.	1.000	1.000	1.000	B31S7
C50		-16	5145	-6	504	-394	-28122	721.	1.000	1.000	1.000	
C50	TNGT	16	5727	6	-504	394	28122	721.	1.000	1.000	1.000	B31S7
C50A		-16	-4124	-6	504	-427	-305	19.	1.000	1.000	1.000	
C50A	TNGT	16	4124	6	-504	427	305	19.	1.000	1.000	1.000	B31S7
C50B		-16	-2520	-6	504	-460	18457	473.	1.000	1.000	1.000	
C50B	TNGT	16	2520	6	-504	460	-18457	473.	1.000	1.000	1.000	B31S7
C50C		-16	-917	-6	504	-493	28163	722.	1.000	1.000	1.000	
C50C	TNGT	16	917	6	-504	493	-28163	722.	1.000	1.000	1.000	B31S7
C50D		-16	686	-6	504	-526	28814	739.	1.000	1.000	1.000	
C50D	TNGT	16	-686	6	-504	526	-28814	739.	1.000	1.000	1.000	B31S7
C50E		-16	2290	-6	504	-559	20410	523.	1.000	1.000	1.000	
C50E	TNGT	16	-2290	6	-504	559	-20410	523.	1.000	1.000	1.000	B31S7
C55		-16	3893	-6	504	-592	2950	78.	1.000	1.000	1.000	
C55	TNGT	16	-3893	6	-504	592	-2950	78.	1.000	1.000	1.000	B31S7
C60		-16	5042	-6	504	-615	-15131	388.	1.000	1.000	1.000	
C60	TNGT	16	2538	6	-504	615	15131	388.	1.000	1.000	1.000	B31S7
C65 B		-16	-1268	-6	504	-641	-6619	171.	1.000	1.000	1.000	
C65 B	BEND	16	6	-1268	-504	6619	-641	302.	2.356	6.986	6.986	B31S7
C65 M		-16	7	543	-3352	-3002	639	206.	2.356	6.986	6.986	

Calc. 1-1 R.1
App. 2, p. 63

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
C65 M	BEND	16	-7	-543	3352	3002	-639	206.	2.356	6.986	6.986	B31S7
C65 E		-6	16	-182	-4211	616	608	195.	2.356	6.986	6.986	
C65 E	TNGT	6	182	16	4211	-608	616	110.	1.000	1.000	1.000	B31S7
C65A		-6	-1244	-16	-4211	547	2052	121.	1.000	1.000	1.000	
C65A	TNGT	6	1244	16	4211	-547	-2052	121.	1.000	1.000	1.000	B31S7
C70		-6	-2307	-16	-4211	486	8697	248.	1.000	1.000	1.000	
C70	TNGT	6	-3201	16	4211	-486	-8697	248.	1.000	1.000	1.000	B31S7
C70A		-6	1520	-16	-4211	390	-5280	173.	1.000	1.000	1.000	
C70A	TNGT	6	-1520	16	4211	-390	5280	173.	1.000	1.000	1.000	B31S7
C70B		-6	-161	-16	-4211	294	-9305	262.	1.000	1.000	1.000	
C70B	TNGT	6	161	16	4211	-294	9305	262.	1.000	1.000	1.000	B31S7
C70C		-6	-1842	-16	-4211	198	-3378	138.	1.000	1.000	1.000	
C70C	TNGT	6	1842	16	4211	-198	3378	138.	1.000	1.000	1.000	B31S7
C75		-6	-3523	-16	-4211	102	12502	338.	1.000	1.000	1.000	
C75	TNGT	6	-3859	16	4211	-102	-12502	338.	1.000	1.000	1.000	B31S7
C75A		-6	2143	-16	-4211	3	-5630	180.	1.000	1.000	1.000	
C75A	TNGT	6	-2143	16	4211	-3	5630	180.	1.000	1.000	1.000	B31S7
C75B		-6	428	-16	-4211	-95	-13398	360.	1.000	1.000	1.000	
C75B	TNGT	6	-428	16	4211	95	13398	360.	1.000	1.000	1.000	B31S7
C75C		-6	-1287	-16	-4211	-193	-10802	297.	1.000	1.000	1.000	
C75C	TNGT	6	1287	16	4211	193	10802	297.	1.000	1.000	1.000	B31S7
C80		-6	-3003	-16	-4211	-291	2156	121.	1.000	1.000	1.000	
C80	TNGT	6	-1524	16	4211	291	-2156	121.	1.000	1.000	1.000	B31S7
C85 B		-6	1170	-16	-4211	-311	472	109.	1.000	1.000	1.000	
C85 B	BEND	6	-16	-1170	4211	472	311	192.	2.356	6.986	6.986	B31S7
C85 M		7	16	445	-2433	4453	-354	230.	2.356	6.986	6.986	
C85 M	BEND	-7	-16	-445	2433	-4453	354	230.	2.356	6.986	6.986	B31S7
C85 E		16	6	-280	1617	5013	-383	239.	2.356	6.986	6.986	
C85 E	TNGT	-16	280	6	-1617	383	5013	135.	1.000	1.000	1.000	B31S7
C90		16	-741	-6	1617	-392	-4184	162.	1.871	1.000	1.000	
C90	TNGT	37	1101	57	-2774	67	7388	284.	1.871	1.000	1.000	B31S7
C95		-37	-3196	-57	2774	-486	8468	229.	1.000	1.000	1.000	
C95	TNGT	37	-1526	57	-2774	486	-8468	229.	1.000	1.000	1.000	B31S7
C96		-37	-603	-57	2774	-912	5009	149.	1.000	1.000	1.000	

calc. 1-1 R.1
Att. 2, p. 64

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
C96	TNGT	37	603	57	-2774	912	-5009	149.	1.000	1.000	1.000	B31S7:
CSV		-37	-958	-57	2774	-983	5985	171.	1.000	1.000	1.000	
CSV	TNGT	37	958	57	-2774	983	-5985	24.	1.000	1.000	1.000	B31S7:
C97		-37	-2095	-57	2774	-1211	12091	45.	1.000	1.000	1.000	
C97	TNGT	-15975	-13234	26	1080	-1058	-42844	283.	1.000	1.000	1.000	B31S7:
GC1		13517	11220	-26	-1080	769	-93819	620.	1.000	1.000	1.000	
GC1	TNGT	0	41613	0	0	0	114186	755.	1.000	1.000	1.000	B31S7:
CV3		0	-42386	0	0	0	0	0.	1.000	1.000	1.000	
GC1	TNGT	-14479	-26	-113	348	20367	-1279	349.	1.000	1.000	1.000	B31S7:
GC1A		12315	26	113	-348	-19737	1135	338.	1.000	1.000	1.000	
GC1A	TNGT	-12315	-26	-113	348	19737	-1135	338.	1.000	1.000	1.000	B31S7:
GC1B		10150	26	113	-348	-19106	991	327.	1.000	1.000	1.000	
GC1B	TNGT	-10150	-26	-113	348	19106	-991	327.	1.000	1.000	1.000	B31S7:
GC2 B		7985	26	113	-348	-18476	848	316.	1.000	1.000	1.000	
GC2 B	BEND	-7985	114	-22	348	205	18494	483.	2.038	5.622	5.622	B31S7:
GC2 M		4809	-4970	22	-368	156	-10749	281.	2.038	5.622	5.622	
GC2 M	BEND	-4809	4970	-22	368	-156	10749	281.	2.038	5.622	5.622	B31S7:
GC2 E		-114	-5845	22	-128	425	5085	133.	2.038	5.622	5.622	
GC2 E	TNGT	114	-5845	22	128	425	5085	87.	1.000	1.000	1.000	B31S7:
GC2A		-114	3968	-22	-128	-530	-28751	491.	1.000	1.000	1.000	
GC2A	TNGT	114	-3968	22	128	530	28751	491.	1.000	1.000	1.000	B31S7:
GC2B		-114	2091	-22	-128	-636	-43362	741.	1.000	1.000	1.000	
GC2B	TNGT	114	-2091	22	128	636	43362	741.	1.000	1.000	1.000	B31S7:
GC2C		-114	214	-22	-128	-741	-48921	836.	1.000	1.000	1.000	
GC2C	TNGT	114	-214	22	128	741	48921	836.	1.000	1.000	1.000	B31S7:
GC2D		-114	-1663	-22	-128	-847	-45426	776.	1.000	1.000	1.000	
GC2D	TNGT	114	1663	22	128	847	45426	776.	1.000	1.000	1.000	B31S7:
GC2E		-114	-3540	-22	-128	-953	-32878	562.	1.000	1.000	1.000	
GC2E	TNGT	114	3540	22	128	953	32878	562.	1.000	1.000	1.000	B31S7:
GC4 B		-114	-5417	-22	-128	-1058	-11276	193.	1.000	1.000	1.000	
GC4 B	BEND	114	-5417	-22	128	-1058	-11276	296.	2.038	5.622	5.622	B31S7:
GC4 M		4506	4668	22	680	893	-3499	96.	2.038	5.622	5.622	
GC4 M	BEND	-4506	-4668	-22	-680	-893	3499	96.	2.038	5.622	5.622	B31S7:
GC4 E		7557	114	22	1135	205	-10805	284.	2.038	5.622	5.622	

Calc. 1-1 R.
App. 2, P. 5

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
GC4 E	TNGT	-7557	26	-113	-1135	-10791	-580	186.	1.000	1.000	1.000	B31S7
GC4A		9292	-26	113	1135	11297	696	194.	1.000	1.000	1.000	
GC4A	TNGT	-9292	26	-113	-1135	-11297	-696	194.	1.000	1.000	1.000	B31S7
GC4B		11027	-26	113	1135	11802	811	203.	1.000	1.000	1.000	
GC4B	TNGT	-11027	26	-113	-1135	-11802	-811	203.	1.000	1.000	1.000	B31S7
GC4C		12762	-26	113	1135	12307	926	212.	1.000	1.000	1.000	
GC4C	TNGT	-12762	26	-113	-1135	-12307	-926	212.	1.000	1.000	1.000	B31S7
GC4D		14498	-26	113	1135	12813	1041	220.	1.000	1.000	1.000	
GC4D	TNGT	-14498	26	-113	-1135	-12813	-1041	220.	1.000	1.000	1.000	B31S7
GC4E		16233	-26	113	1135	13318	1156	229.	1.000	1.000	1.000	
GC4E	TNGT	-16233	26	-113	-1135	-13318	-1156	229.	1.000	1.000	1.000	B31S7
GC4F		17968	-26	113	1135	13824	1272	238.	1.000	1.000	1.000	
GC4F	TNGT	-17968	26	-113	-1135	-13824	-1272	238.	1.000	1.000	1.000	B31S7
GC4G		19703	-26	113	1135	14329	1387	247.	1.000	1.000	1.000	
GC4G	TNGT	-19703	26	-113	-1135	-14329	-1387	247.	1.000	1.000	1.000	B31S7
GC5		21438	-26	113	1135	14834	1502	255.	1.000	1.000	1.000	
D05	TNGT	10	-10754	35	3162	-1775	-29688	767.	1.080	1.000	1.000	B31S7
D06		-10	9429	-35	-3162	1614	-17405	455.	1.000	1.000	1.000	
D06	TNGT	10	646	35	3162	-1614	17405	455.	1.000	1.000	1.000	B31S7
D07		-10	-2870	-35	-3162	1344	-3634	711.	7.400	1.000	1.000	
D07	TNGT	1299	10	35	1344	3162	3634	711.	7.400	1.000	1.000	B31S7
D07A		-124	-10	-35	-1344	-3305	-3593	130.	1.000	1.000	1.000	
D07A	TNGT	124	10	35	1344	3305	3593	130.	1.000	1.000	1.000	B31S7
D07B		1051	-10	-35	-1344	-3448	-3552	131.	1.000	1.000	1.000	
D07B	TNGT	-1051	10	35	1344	3448	3552	131.	1.000	1.000	1.000	B31S7
D10 B		2226	-10	-35	-1344	-3591	-3512	133.	1.000	1.000	1.000	
D10 B	BEND	-2226	10	35	1344	3591	3512	235.	2.356	6.986	6.986	B31S7
D10 M		2080	-2094	-35	-3522	-1669	-915	181.	2.356	6.986	6.986	
D10 M	BEND	-2080	2094	35	3522	1669	915	181.	2.356	6.986	6.986	B31S7
D10 E		-10	-3676	-35	-3703	1231	6754	353.	2.356	6.986	6.986	
D10 E	TNGT	10	3676	35	3703	-1231	-6754	200.	1.000	1.000	1.000	B31S7
D15		-10	-4233	-35	-3703	1164	14519	385.	1.000	1.000	1.000	
D15	TNGT	10	-4005	35	3703	-1164	-14519	385.	1.000	1.000	1.000	B31S7
D15A		-10	1821	-35	-3703	898	-7882	224.	1.000	1.000	1.000	

Calc. 1-1 Rev. 2, p. 69

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
D15A	TNGT	10	-1821	35	3703	-898	7882	224.	1.000	1.000	1.000	B31S7
D15B		-10	-362	-35	-3703	633	-13494	359.	1.000	1.000	1.000	
D15B	TNGT	10	362	35	3703	-633	13494	359.	1.000	1.000	1.000	B31S7
D15C		-10	-2545	-35	-3703	367	-2315	112.	1.000	1.000	1.000	
D15C	TNGT	10	2545	35	3703	-367	2315	112.	1.000	1.000	1.000	B31S7
D20		-10	-4729	-35	-3703	102	25653	664.	1.000	1.000	1.000	
D20	TNGT	10	-2882	35	3703	-102	-25653	664.	1.000	1.000	1.000	B31S7
D20A		-10	704	-35	-3703	-163	11895	319.	1.000	1.000	1.000	
D20A	TNGT	10	-704	35	3703	163	-11895	319.	1.000	1.000	1.000	B31S7
D25		-10	-1502	-35	-3703	-432	14994	396.	1.000	1.000	1.000	
D25	TNGT	10	-4232	35	3703	432	-14994	396.	1.000	1.000	1.000	B31S7
D30 B		-10	4043	-35	-3703	-455	12236	328.	1.000	1.000	1.000	
D30 B	BEND	10	35	4043	3703	-12236	-455	579.	2.356	6.986	6.986	B31S7
D30 M		-31	-17	-3318	2419	2857	525	171.	2.356	6.986	6.986	
D30 M	BEND	31	17	3318	-2419	-2857	-525	171.	2.356	6.986	6.986	B31S7
D30 E		-35	10	-2594	807	-6438	535	295.	2.356	6.986	6.986	
D30 E	TNGT	35	2594	10	-807	-535	-6438	167.	1.000	1.000	1.000	B31S7
D30A		-35	-1402	-10	807	494	14825	381.	1.000	1.000	1.000	
D30A	TNGT	35	1402	10	-807	-494	-14825	381.	1.000	1.000	1.000	B31S7
D33		-35	-210	-10	807	452	18208	467.	1.000	1.000	1.000	
D33	TNGT	35	210	10	-807	-452	-18208	467.	1.000	1.000	1.000	B31S7
D35		-35	1198	-10	807	403	15760	405.	1.000	1.000	1.000	
D35	TNGT	35	1666	10	-807	-403	-15760	405.	1.000	1.000	1.000	B31S7
D35A		-35	121	-10	807	342	20623	529.	1.000	1.000	1.000	
D35A	TNGT	35	-121	10	-807	-342	-20623	529.	1.000	1.000	1.000	B31S7
D35B		-35	1908	-10	807	280	14238	366.	1.000	1.000	1.000	
D35B	TNGT	35	-1908	10	-807	-280	-14238	366.	1.000	1.000	1.000	B31S7
D35C		-35	3695	-10	807	218	-3395	90.	1.000	1.000	1.000	
D35C	TNGT	35	-3695	10	-807	-218	3395	90.	1.000	1.000	1.000	B31S7
D40		-35	5482	-10	807	156	-32276	828.	1.000	1.000	1.000	
D40	TNGT	35	5333	10	-807	-156	32276	828.	1.000	1.000	1.000	B31S7
D40A		-35	-3536	-10	807	93	-4201	110.	1.000	1.000	1.000	
D40A	TNGT	35	3536	10	-807	-93	4201	110.	1.000	1.000	1.000	B31S7
D40B		-35	-1739	-10	807	31	12494	321.	1.000	1.000	1.000	

Calc. 1-1 R.1
Att. 2, p. 67

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
D40B	TNGT	35	1739	10	-807	-31	-12494	321.	1.000	1.000	1.000	B31S7
D40C		-35	59	-10	807	-31	17812	457.	1.000	1.000	1.000	
D40C	TNGT	35	-59	10	-807	31	-17812	457.	1.000	1.000	1.000	B31S7
D40D		-35	1856	-10	807	-93	11750	302.	1.000	1.000	1.000	
D40D	TNGT	35	-1856	10	-807	93	-11750	302.	1.000	1.000	1.000	B31S7
D40E		-35	3654	-10	807	-156	-5690	147.	1.000	1.000	1.000	
D40E	TNGT	35	-3654	10	-807	156	5690	147.	1.000	1.000	1.000	B31S7
D45		-35	5451	-10	807	-218	-34509	885.	1.000	1.000	1.000	
D45	TNGT	35	5393	10	-807	218	34509	885.	1.000	1.000	1.000	B31S7
D45A		-35	-3599	-10	807	-280	-6100	158.	1.000	1.000	1.000	
D45A	TNGT	35	3599	10	-807	280	6100	158.	1.000	1.000	1.000	B31S7
D45B		-35	-1805	-10	807	-342	10973	282.	1.000	1.000	1.000	
D45B	TNGT	35	1805	10	-807	342	-10973	282.	1.000	1.000	1.000	B31S7
D45C		-35	-11	-10	807	-404	16712	429.	1.000	1.000	1.000	
D45C	TNGT	35	11	10	-807	404	-16712	429.	1.000	1.000	1.000	B31S7
D45D		-35	1783	-10	807	-467	11115	286.	1.000	1.000	1.000	
D45D	TNGT	35	-1783	10	-807	467	-11115	286.	1.000	1.000	1.000	B31S7
D45E		-35	3577	-10	807	-529	-5817	151.	1.000	1.000	1.000	
D45E	TNGT	35	-3577	10	-807	529	5817	151.	1.000	1.000	1.000	B31S7
D50		-35	5371	-10	807	-591	-34083	874.	1.000	1.000	1.000	
D50	TNGT	35	5987	10	-807	591	34083	874.	1.000	1.000	1.000	B31S7
D50A		-35	-4384	-10	807	-646	-4805	126.	1.000	1.000	1.000	
D50A	TNGT	35	4384	10	-807	646	4805	126.	1.000	1.000	1.000	B31S7
D50B		-35	-2781	-10	807	-702	15423	396.	1.000	1.000	1.000	
D50B	TNGT	35	2781	10	-807	702	-15423	396.	1.000	1.000	1.000	B31S7
D50C		-35	-1178	-10	807	-758	26601	682.	1.000	1.000	1.000	
D50C	TNGT	35	1178	10	-807	758	-26601	682.	1.000	1.000	1.000	B31S7
D50D		-35	424	-10	807	-813	28729	737.	1.000	1.000	1.000	
D50D	TNGT	35	-424	10	-807	813	-28729	737.	1.000	1.000	1.000	B31S7
D50E		-35	2027	-10	807	-869	21808	560.	1.000	1.000	1.000	
D50E	TNGT	35	-2027	10	-807	869	-21808	560.	1.000	1.000	1.000	B31S7
D55		-35	3630	-10	807	-924	5837	153.	1.000	1.000	1.000	
D55	TNGT	35	-3630	10	-807	924	-5837	153.	1.000	1.000	1.000	B31S7
D60		-35	4776	-10	807	-964	-11130	287.	1.000	1.000	1.000	

Calc. 1-1 R.1
Att. 2, p 58

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
D60	TNGT	35	1797	10	-807	964	11130	287.	1.000	1.000	1.000	B31S7
D65 B		-35	-1659	-10	807	-969	-10293	266.	1.000	1.000	1.000	
D65 B	BEND	35	10	-1659	-807	10293	-969	470.	2.356	6.986	6.986	B31S7
D65 M		-31	17	934	-5363	-4914	958	332.	2.356	6.986	6.986	
D65 M	BEND	31	-17	-934	5363	4914	-958	332.	2.356	6.986	6.986	B31S7
D65 E		-10	35	210	-6612	1586	888	311.	2.356	6.986	6.986	
D65 E	TNGT	10	-210	35	6612	-888	1586	176.	1.000	1.000	1.000	B31S7
D65A		-10	-394	-35	-6612	815	-1391	174.	1.000	1.000	1.000	
D65A	TNGT	10	394	35	6612	-815	1391	174.	1.000	1.000	1.000	B31S7
D70		-10	-997	-35	-6612	742	86	171.	1.000	1.000	1.000	
D70	TNGT	10	-3221	35	6612	-742	-86	171.	1.000	1.000	1.000	B31S7
D70A		-10	1748	-35	-6612	563	-12800	370.	1.000	1.000	1.000	
D70A	TNGT	10	-1748	35	6612	-563	12800	370.	1.000	1.000	1.000	B31S7
D70B		-10	276	-35	-6612	384	-18049	493.	1.000	1.000	1.000	
D70B	TNGT	10	-276	35	6612	-384	18049	493.	1.000	1.000	1.000	B31S7
D70C		-10	-1196	-35	-6612	205	-15663	436.	1.000	1.000	1.000	
D70C	TNGT	10	1196	35	6612	-205	15663	436.	1.000	1.000	1.000	B31S7
D75		-10	-2669	-35	-6612	25	-5640	223.	1.000	1.000	1.000	
D75	TNGT	10	-2256	35	6612	-25	5640	223.	1.000	1.000	1.000	B31S7
D75A		-10	515	-35	-6612	-186	-14139	400.	1.000	1.000	1.000	
D75A	TNGT	10	-515	35	6612	186	14139	400.	1.000	1.000	1.000	B31S7
D75B		-10	-1226	-35	-6612	-398	-11957	350.	1.000	1.000	1.000	
D75B	TNGT	10	1226	35	6612	398	11957	350.	1.000	1.000	1.000	B31S7
D80		-10	-2968	-35	-6612	-610	907	172.	1.000	1.000	1.000	
D80	TNGT	10	-94	35	6612	610	-907	172.	1.000	1.000	1.000	B31S7
D85 B		-10	-717	-35	-6612	-708	1796	177.	1.000	1.000	1.000	
D85 B	BEND	10	-35	717	6612	1796	708	312.	2.356	6.986	6.986	B31S7
D85 M		17	31	-1441	-6863	880	-797	315.	2.356	6.986	6.986	
D85 M	BEND	-17	-31	1441	6863	-880	797	315.	2.356	6.986	6.986	B31S7
D85 E		35	10	-2166	-5837	1284	-853	273.	2.356	6.986	6.986	
D85 E	TNGT	-35	2166	10	5837	853	1284	155.	1.000	1.000	1.000	B31S7
D90		35	-2627	-10	-5837	-869	2611	232.	1.871	1.000	1.000	
D90	TNGT	-75	4352	-59	3953	1290	2597	176.	1.871	1.000	1.000	B31S7
D95		75	-5306	59	-3953	-1093	13625	365.	1.000	1.000	1.000	

calc. 1-1 Rev. 2, p 69

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
D95	TNGT	-75	163	-59	3953	1093	-13625	365.	1.000	1.000	1.000	B31S7
D96		75	-2261	59	-3953	-660	22583	588.	1.000	1.000	1.000	
D96	TNGT	-75	2261	-59	3953	660	-22583	588.	1.000	1.000	1.000	B31S7
DSV		75	-2545	59	-3953	-601	24986	649.	1.000	1.000	1.000	
DSV	TNGT	-75	2545	-59	3953	601	-24986	91.	1.000	1.000	1.000	B31S7
D97		75	-3682	59	-3953	-367	37440	136.	1.000	1.000	1.000	
D97	TNGT	0	-76966	0	0	0	-280870	1014.	1.000	1.000	1.000	B31S7
MS4		0	77996	0	0	0	0	0.	1.000	1.000	1.000	
D97	TNGT	-16145	-12994	-242	2075	10008	-36180	248.	1.000	1.000	1.000	B31S7
GD1		13687	10980	242	-2075	-7298	-97795	648.	1.000	1.000	1.000	
GD1	TNGT	0	41659	0	0	0	114311	755.	1.000	1.000	1.000	B31S7
CV4		0	-42432	0	0	0	0	0.	1.000	1.000	1.000	
GD1	TNGT	-14505	242	181	6230	16516	4330	310.	1.000	1.000	1.000	B31S7
GD1A		12340	-242	-181	-6230	-17521	-2981	322.	1.000	1.000	1.000	
GD1A	TNGT	-12340	242	181	6230	17521	2981	322.	1.000	1.000	1.000	B31S7
GD1B		10175	-242	-181	-6230	-18526	-1632	335.	1.000	1.000	1.000	
GD1B	TNGT	-10175	242	181	6230	18526	1632	335.	1.000	1.000	1.000	B31S7
GD2 B		8010	-242	-181	-6230	-19531	-283	350.	1.000	1.000	1.000	
GD2 B	BEND	-8010	-190	236	6230	-1008	19508	535.	2.038	5.622	5.622	B31S7
GD2 M		5042	-4773	-236	-3934	4535	-12489	362.	2.038	5.622	5.622	
GD2 M	BEND	-5042	4773	236	3934	-4535	12489	362.	2.038	5.622	5.622	B31S7
GD2 E		190	-5870	-236	183	5405	3097	163.	2.038	5.622	5.622	
GD2 E	TNGT	-190	-5870	-236	-183	5405	3097	106.	1.000	1.000	1.000	B31S7
GD2A		190	3993	236	183	-4269	-26885	465.	1.000	1.000	1.000	
GD2A	TNGT	-190	-3993	-236	-183	4269	26885	465.	1.000	1.000	1.000	B31S7
GD2B		190	2116	236	183	-3132	-41619	713.	1.000	1.000	1.000	
GD2B	TNGT	-190	-2116	-236	-183	3132	41619	713.	1.000	1.000	1.000	B31S7
GD2C		190	239	236	183	-1996	-47297	809.	1.000	1.000	1.000	
GD2C	TNGT	-190	-239	-236	-183	1996	47297	809.	1.000	1.000	1.000	B31S7
GD2D		190	-1639	236	183	-859	-43920	750.	1.000	1.000	1.000	
GD2D	TNGT	-190	1639	-236	-183	859	43920	750.	1.000	1.000	1.000	B31S7
GD2E		190	-3516	236	183	277	-31488	538.	1.000	1.000	1.000	
GD2E	TNGT	-190	3516	-236	-183	-277	31488	538.	1.000	1.000	1.000	B31S7
GD4 B		190	-5393	236	183	1414	-10001	173.	1.000	1.000	1.000	

calc. 1-1 R.1
Att. 2, p. 75

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
GD4 B	BEND	-190	-5393	236	-183	1414	-10001	264.	2.038	5.622	5.622	B31S7
GD4 M		4704	4436	-236	-1112	-1712	-4404	127.	2.038	5.622	5.622	
GD4 M	BEND	-4704	-4436	236	1112	1712	4404	127.	2.038	5.622	5.622	B31S7
GD4 E		7533	-190	-236	-2239	-1008	-10933	293.	2.038	5.622	5.622	
GD4 E	TNGT	-7533	-242	181	2239	-10963	602	191.	1.000	1.000	1.000	B31S7
GD4A		9734	242	-181	-2239	9941	-1973	177.	1.000	1.000	1.000	
GD4A	TNGT	-9734	-242	181	2239	-9941	1973	177.	1.000	1.000	1.000	B31S7
GD4B		11936	242	-181	-2239	8919	-3345	167.	1.000	1.000	1.000	
GD4B	TNGT	-11936	-242	181	2239	-8919	3345	167.	1.000	1.000	1.000	B31S7
GD4C		14137	242	-181	-2239	7897	-4716	162.	1.000	1.000	1.000	
GD4C	TNGT	-14137	-242	181	2239	-7897	4716	162.	1.000	1.000	1.000	B31S7
GD4D		16338	242	-181	-2239	6875	-6088	161.	1.000	1.000	1.000	
GD4D	TNGT	-16338	-242	181	2239	-6875	6088	161.	1.000	1.000	1.000	B31S7
GD4E		18540	242	-181	-2239	5853	-7460	166.	1.000	1.000	1.000	
GD4E	TNGT	-18540	-242	181	2239	-5853	7460	166.	1.000	1.000	1.000	B31S7
GD4F		20741	242	-181	-2239	4830	-8831	176.	1.000	1.000	1.000	
GD4F	TNGT	-20741	-242	181	2239	-4830	8831	176.	1.000	1.000	1.000	B31S7
GD4G		22942	242	-181	-2239	3808	-10203	190.	1.000	1.000	1.000	
GD4G	TNGT	-22942	-242	181	2239	-3808	10203	190.	1.000	1.000	1.000	B31S7
GD5 B		25144	242	-181	-2239	2786	-11574	207.	1.000	1.000	1.000	
GD5 B	BEND	-25144	-243	181	2239	-2786	11574	414.	2.670	8.433	8.433	B31S7
GD5 M		18455	-18112	-181	264	3255	5531	220.	2.670	8.433	8.433	
GD5 M	BEND	-18455	18112	181	-264	-3255	-5531	220.	2.670	8.433	8.433	B31S7
GD5 E		242	-26570	-181	2364	1817	48648	1667.	2.670	8.433	8.433	
GD5 E	TNGT	-242	26570	181	-2364	-1817	-48648	833.	1.000	1.000	1.000	B31S7
GD6		242	-26830	-181	2364	1697	66448	1136.	1.000	1.000	1.000	
A90	TNGT	-486	52	-56	-695	-700	1223	202.	1.871	1.000	1.000	B31S7
105 B		589	-52	56	695	747	-1180	181.	1.000	1.000	1.000	
105 B	BEND	-589	52	-56	-695	-747	1180	242.	1.782	4.598	4.598	B31S7
105 M		501	-574	56	1049	107	-757	201.	1.782	4.598	4.598	
105 M	BEND	-501	574	-56	-1049	-107	757	201.	1.782	4.598	4.598	B31S7
105 E		-52	-930	56	846	-596	321	168.	1.782	4.598	4.598	
105 E	TNGT	52	930	-56	-846	596	-321	126.	1.000	1.000	1.000	B31S7
105A		-52	-1356	56	846	-402	4251	505.	1.000	1.000	1.000	

Calc 1-1 R.1
Att. 2, p. 71

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z)	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
105A	TNGT	52	1356	-56	-846	402	-4251	505.	1.000	1.000	1.000	B31S7:
110		-52	-1783	56	846	-208	9647	1124.	1.000	1.000	1.000	
110	TNGT	52	-1404	-56	-846	208	-9647	1124.	1.000	1.000	1.000	B31S7:
110A		-52	754	56	846	88	3995	474.	1.000	1.000	1.000	
110A	TNGT	52	-56	754	-846	-3995	88	474.	1.000	1.000	1.000	B31S7:
115		-52	56	-104	846	1749	-384	202.	1.461	1.000	1.000	
115	TNGT	-107	1	-102	-1141	9309	-59	576.	1.461	1.000	1.000	B31S7:
115A		107	-1	1148	1141	-5922	66	338.	1.000	1.000	1.000	
115A	TNGT	-107	1148	1	-1141	66	5922	338.	1.000	1.000	1.000	B31S7:
115B		107	-2194	-1	1141	-73	3130	187.	1.000	1.000	1.000	
115B	TNGT	-107	2194	1	-1141	73	-3130	187.	1.000	1.000	1.000	B31S7:
120		107	-3240	-1	1141	-79	17847	1002.	1.000	1.000	1.000	
120	TNGT	-107	-2650	1	-1141	79	-17847	1002.	1.000	1.000	1.000	B31S7:
120A		107	1661	-1	1141	-86	6800	386.	1.000	1.000	1.000	
120A	TNGT	-107	-1661	1	-1141	86	-6800	386.	1.000	1.000	1.000	B31S7:
120B		107	671	-1	1141	-92	825	79.	1.000	1.000	1.000	
120B	TNGT	-107	-671	1	-1141	92	-825	79.	1.000	1.000	1.000	B31S7:
120C		107	-318	-1	1141	-98	-79	64.	1.000	1.000	1.000	
120C	TNGT	-107	318	1	-1141	98	79	64.	1.000	1.000	1.000	B31S7:
125		107	-1308	-1	1141	-105	4088	1070.	6.000	1.000	1.000	
125	TNGT	-107	-1940	1	-1141	105	-4088	1070.	6.000	1.000	1.000	B31S7:
130 B		107	1345	-1	1141	-109	-977	84.	1.000	1.000	1.000	
130 B	BEND	-107	-1	-1345	-1141	-977	109	115.	1.821	4.747	4.747	B31S7:
130 M		77	-75	1004	2308	1737	-40	221.	1.821	4.747	4.747	
130 M	BEND	-77	75	-1004	-2308	-1737	40	221.	1.821	4.747	4.747	B31S7:
130 E		1	-107	663	3445	908	130	273.	1.821	4.747	4.747	
130 E	TNGT	-1	-663	-107	-3445	-130	908	200.	1.000	1.000	1.000	B31S7:
133 B		1	518	107	3445	211	-1350	208.	1.000	1.000	1.000	
133 B	BEND	-1	107	-518	-3445	-1350	-211	371.	2.386	7.121	7.121	B31S7:
133 M		-75	-77	290	3585	-1060	325	376.	2.386	7.121	7.121	
133 M	BEND	75	77	-290	-3585	1060	-325	376.	2.386	7.121	7.121	B31S7:
135		-107	-1	63	1879	-3103	374	365.	2.386	7.121	7.121	
135	TNGT	107	63	1	-1879	374	3103	204.	1.000	1.000	1.000	B31S7:
140		-107	-15	-1	1879	-374	-3093	204.	1.000	1.000	1.000	

Calc. 1-1 R.1
Att. 2, p 72

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI) .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
140	TNGT	107	15	1	-1879	374	3093	204.	1.000	1.000	1.000	B31S7
144		-107	130	-1	1879	-375	-3137	206.	1.000	1.000	1.000	
144	TNGT	107	-130	1	-1879	375	3137	206.	1.000	1.000	1.000	B31S7
145		-107	8881	-1	1879	-378	-14025	793.	1.000	1.000	1.000	
145	TNGT	107	17928	1	-1879	378	14025	793.	1.000	1.000	1.000	B31S7
146		-107	20093	-1	1879	-391	-25392	1426.	1.000	1.000	1.000	
146	TNGT	107	9945	1	-1879	391	25392	1426.	1.000	1.000	1.000	B31S7
147		-107	-1194	-1	1879	-394	-11933	677.	1.000	1.000	1.000	
147	TNGT	107	1194	1	-1879	394	11933	677.	1.000	1.000	1.000	B31S7
150		-107	-1137	-1	1879	-395	-11586	658.	1.000	1.000	1.000	
150	BEND	107	649	-933	-1879	9742	6285	1177.	2.386	7.121	7.121	B31S7
155 M		-323	-499	840	-1880	-9214	-5943	1115.	2.386	7.121	7.121	
155 M	BEND	323	499	-840	1880	9214	5943	1115.	2.386	7.121	7.121	B31S7
155 E		-443	-293	747	-5164	-7344	-5709	1066.	2.386	7.121	7.121	
155 E	TNGT	443	799	-67	5164	-1880	9110	596.	1.000	1.000	1.000	B31S7
160 B		-161	-158	67	-5164	2124	-7375	518.	1.000	1.000	1.000	
160 B	BEND	161	-10	171	5163	-5680	-5162	707.	1.821	4.747	4.747	B31S7
160 M		-108	-19	-32	-2625	7134	5163	703.	1.821	4.747	4.747	
160 M	BEND	108	19	32	2625	-7134	-5163	703.	1.821	4.747	4.747	B31S7
160 E		-107	-74	108	300	7630	5203	707.	1.821	4.747	4.747	
160 E	TNGT	107	-131	1	-300	79	9235	518.	1.000	1.000	1.000	B31S7
165		-107	659	-1	300	-82	-10316	578.	1.000	1.000	1.000	
165	TNGT	107	3345	1	-300	82	10316	578.	1.000	1.000	1.000	B31S7
165A		-107	-2247	-1	300	-89	5587	313.	1.000	1.000	1.000	
165A	TNGT	107	2247	1	-300	89	-5587	313.	1.000	1.000	1.000	B31S7
165B		-107	-1149	-1	300	-96	15244	854.	1.000	1.000	1.000	
165B	TNGT	107	1149	1	-300	96	-15244	854.	1.000	1.000	1.000	B31S7
165C		-107	-51	-1	300	-103	18656	1045.	1.000	1.000	1.000	
165C	TNGT	107	-1	51	-300	18656	103	1045.	1.000	1.000	1.000	B31S7
170		-107	1	1047	300	-15823	-110	972.	1.461	1.000	1.000	
170	TNGT	68	-40	-1829	864	16151	-351	993.	1.461	1.000	1.000	B31S7
175		-68	40	2215	-864	-12107	270	1020.	2.000	1.000	1.000	
175	TNGT	68	-2215	40	864	-270	-12107	2113.	2.000	1.000	1.000	B31S7
180		-68	2918	-40	-864	43	-2437	300.	1.000	1.000	1.000	

Calc. 1-1 R.1
App. 2, P 73

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
180	TNGT	68	382	40	864	-43	2437	300.	1.000	1.000	1.000	B31S7
230 B		-68	63	-40	-864	-100	-1866	239.	1.000	1.000	1.000	
230 B	BEND	68	40	63	864	1866	-100	319.	1.782	4.598	4.598	B31S7
230 M		-77	20	-233	-1992	-897	115	339.	1.782	4.598	4.598	
230 M	BEND	77	-20	233	1992	897	-115	339.	1.782	4.598	4.598	B31S7
230 E		-40	68	-404	-2193	374	51	345.	1.782	4.598	4.598	
230 E	TNGT	40	-404	-68	2193	51	-374	258.	1.000	1.000	1.000	B31S7
230A		-40	723	68	-2193	126	-1076	284.	1.000	1.000	1.000	
230A	TNGT	40	-723	-68	2193	-126	1076	284.	1.000	1.000	1.000	B31S7
235 B		-40	1042	68	-2193	302	-3347	466.	1.000	1.000	1.000	
235 B	BEND	40	1042	68	2193	302	-3347	622.	1.782	4.598	4.598	B31S7
235 M		-886	-829	-68	-1799	1252	4716	807.	1.782	4.598	4.598	
235 M	BEND	886	829	68	1799	-1252	-4716	807.	1.782	4.598	4.598	B31S7
235 E		-1383	40	-68	-422	2073	5318	888.	1.782	4.598	4.598	
235 E	TNGT	1383	40	-68	422	2073	5318	664.	1.000	1.000	1.000	B31S7
D90		-1725	-40	68	-422	-1884	-5207	714.	1.871	1.000	1.000	
115	TNGT	-51	53	206	608	8463	444	522.	1.461	1.000	1.000	B31S7
240		51	-53	180	-608	-8488	-338	716.	2.000	1.000	1.000	
240	TNGT	-51	-180	-53	608	338	-8488	1482.	2.000	1.000	1.000	B31S7
240A		51	754	53	-608	-94	6328	738.	1.000	1.000	1.000	
240A	TNGT	-51	-754	-53	608	94	-6328	738.	1.000	1.000	1.000	B31S7
245 B		51	1328	53	-608	150	1515	190.	1.000	1.000	1.000	
245 B	BEND	-51	-53	1328	608	-1515	150	254.	1.782	4.598	4.598	B31S7
245 M		73	1	-1498	-69	-253	-190	50.	1.782	4.598	4.598	
245 M	BEND	-73	-1	1498	69	253	190	50.	1.782	4.598	4.598	B31S7
245 E		53	-51	-1669	-1026	-2095	-154	363.	1.782	4.598	4.598	
245 E	TNGT	-53	-1669	51	1026	-154	2095	271.	1.000	1.000	1.000	B31S7
250		53	1907	-51	-1026	56	-5522	652.	1.000	1.000	1.000	
250	TNGT	-53	796	51	1026	-56	5522	652.	1.000	1.000	1.000	B31S7
255 B		53	-85	-51	-1026	-236	-3000	369.	1.000	1.000	1.000	
255 B	BEND	-53	-85	-51	1026	-236	-3000	493.	1.782	4.598	4.598	B31S7
255 M		-23	-98	51	-532	955	3022	498.	1.782	4.598	4.598	
255 M	BEND	23	98	-51	532	-955	-3022	498.	1.782	4.598	4.598	B31S7
255 E		-256	-53	51	325	1115	3161	522.	1.782	4.598	4.598	

Calc. 1-1 R.1
All. 2, p. 74

ELEMENT FROM TO	TYPE/TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	STRESS (PSI .75IM/Z	STRESS INT.FAC. (I)	FLEX. IN PLANE	FLEX. OUT PLANE	CODE AND CLASS
255 E	TNGT	256	-53	51	-325	1115	3161	391.	1.000	1.000	1.000	B31S7
C90		-360	53	-51	325	-1157	-3205	440.	1.871	1.000	1.000	
170	TNGT	-39	39	782	328	-1164	461	132.	1.461	1.000	1.000	B31S7
170A		39	-39	-166	-328	-1187	-267	146.	1.000	1.000	1.000	
170A	TNGT	-39	166	-39	328	267	-1187	146.	1.000	1.000	1.000	B31S7
170B		39	450	39	-328	-74	481	68.	1.000	1.000	1.000	
170B	TNGT	-39	-450	-39	328	74	-481	68.	1.000	1.000	1.000	B31S7
260 B		39	1066	39	-328	119	-3285	383.	1.000	1.000	1.000	
260 B	BEND	-39	1066	39	328	119	-3285	512.	1.782	4.598	4.598	B31S7
260 M		-847	-902	-39	-336	99	4724	735.	1.782	4.598	4.598	
260 M	BEND	847	902	39	336	-99	-4724	735.	1.782	4.598	4.598	B31S7
260 E		-1407	-39	-39	-188	260	5436	845.	1.782	4.598	4.598	
260 E	TNGT	1407	-39	-39	188	260	5436	632.	1.000	1.000	1.000	B31S7
B90		-1749	39	39	-188	-152	-5543	713.	1.871	1.000	1.000	
B97	TNGT	183	-29018	83	-17649	-8486	63990	242.	1.000	1.000	1.000	B31S7
S01		-183	29018	-83	17649	8215	-158297	576.	1.000	1.000	1.000	
S01	TNGT	-1198	-28993	86	-19904	-7276	158075	576.	1.000	1.000	1.000	B31S7
A97		1198	28993	-86	19904	6977	-259675	941.	1.000	1.000	1.000	
C97	TNGT	215	130677	-29	19004	-7182	88238	327.	1.000	1.000	1.000	B31S7
MS2		-215	-130677	29	-19004	7277	336464	1217.	1.000	1.000	1.000	
MS2	TNGT	7544	133076	56	-23019	8557	336183	1217.	1.000	1.000	1.000	B31S7
B97		-7544	-133076	-56	23019	-8727	66852	257.	1.000	1.000	1.000	
D97	TNGT	184	27639	-106	-1260	-7581	270490	977.	1.000	1.000	1.000	B31S7
S00		-184	-27639	106	1260	7926	-180665	653.	1.000	1.000	1.000	
S00	TNGT	1501	27598	-86	-21113	-6935	179473	653.	1.000	1.000	1.000	B31S7
C97		-1501	-27598	86	21113	7237	-82201	308.	1.000	1.000	1.000	
A07	TNGT	5438	0	0	0	0	0	0.	7.400	1.000	1.000	B31S7
AR5		-6065	0	0	0	0	0	0.	1.000	1.000	1.000	
B07	TNGT	4799	0	0	0	0	0	0.	7.400	1.000	1.000	B31S7
BR5		-5426	0	0	0	0	0	0.	1.000	1.000	1.000	
C07	TNGT	4228	0	0	0	0	0	0.	7.400	1.000	1.000	B31S7
CR5		-4854	0	0	0	0	0	0.	1.000	1.000	1.000	
D07	TNGT	4169	0	0	0	0	0	0.	7.400	1.000	1.000	B31S7
DR5		-4796	0	0	0	0	0	0.	1.000	1.000	1.000	

*** AT THE MEMBER END 175 OF ELEMENT FROM 175 TO 180 , MAX. STRESS (PSI) IS 2113.

Calc. 1-1 R.1
AIP. 2, P. 75

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
A05	ANC	X-7A									
		WT01	-6.	-10243.	-3.	27806.	-377.	420.	.000	.000	.000
		WT02	-9.	-10129.	-4.	27399.	-433.	653.	.000	.000	.000
		THRM01	-638.	20416.	-528.	-215228.	-8515.	6665.	.000	.000	.000
A15	SPR	1DB-H1									
		WT01	0.	-5.	0.	0.	0.	0.	-.003	-.003	-.007
		WT02	0.	-8.	0.	0.	0.	0.	-.004	-.005	-.005
		THRM01							-.031	.725	.614
A20	SPR	1DB-H2									
		WT01	0.	-30.	0.	0.	0.	0.	-.011	-.014	-.007
		WT02	0.	-35.	0.	0.	0.	0.	-.013	-.016	-.005
		THRM01							.009	.165	1.881
A35	RAD	1DB-H3									
		WT01	0.	-1865.	0.	0.	0.	0.	-.013	.000	-.005
		WT02	0.	-2160.	0.	0.	0.	0.	-.015	.000	-.003
		THRM01	0.	1726.	0.	0.	0.	0.	.332	.000	2.111
A40	RAD	1DB-H4									
		WT01	0.	-8561.	0.	0.	0.	0.	-.013	.000	-.001
		WT02	0.	-8533.	0.	0.	0.	0.	-.015	.000	.001
		THRM01	0.	-470.	0.	0.	0.	0.	.880	.000	1.867
A45	RAD	1DB-H5									
		WT01	0.	-11154.	0.	0.	0.	0.	-.013	.000	.011
		WT02	0.	-10944.	0.	0.	0.	0.	-.015	.000	.013
		THRM01	0.	51.	0.	0.	0.	0.	2.439	.000	1.033
A50	RAD	1GB-H6									
		WT01	0.	-10549.	0.	0.	0.	0.	-.013	.000	.026
		WT02	0.	-11352.	0.	0.	0.	0.	-.015	.000	.027
		THRM01	0.	-95.	0.	0.	0.	0.	4.001	.000	.249
A55	RAD	1DB-H7									
		WT01	0.	-10817.	0.	0.	0.	0.	-.013	.000	.046
		WT02	0.	-8167.	0.	0.	0.	0.	-.015	.000	.046
		THRM01	0.	137.	0.	0.	0.	0.	5.562	.000	-.160
A70	RAD	1DB-H9									
		WT01	0.	-5733.	0.	0.	0.	0.	-.022	.000	.057
		WT02	0.	-8975.	0.	0.	0.	0.	-.025	.000	.057
		THRM01	0.	73.	0.	0.	0.	0.	5.957	.000	.330

Calc. 1-1 R. App. 2, p. 76

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD	TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
A75	SPR		1DB-H10									
		WT01		0.	457.	0.	0.	0.	0.	-.053	.152	.057
		WT02		0.	-246.	0.	0.	0.	0.	-.055	-.082	.057
		THRM01								4.879	.032	1.614
A80	SPR		1DB-H11									
		WT01		0.	598.	0.	0.	0.	0.	-.078	.277	.057
		WT02		0.	-146.	0.	0.	0.	0.	-.080	-.068	.057
		THRM01								3.846	.083	2.611
A85	SPR		1DB-H12									
		WT01		0.	921.	0.	0.	0.	0.	-.092	.307	.057
		WT02		0.	-110.	0.	0.	0.	0.	-.094	-.037	.057
		THRM01								3.261	.110	3.145
A95	SPR		1DB-H13									
		WT01		0.	122.	0.	0.	0.	0.	-.096	.051	.036
		WT02		0.	-23.	0.	0.	0.	0.	-.098	-.010	.037
		THRM01								2.227	.048	2.434
MS1	RAD		MS-1									
		WT01		0.	-62134.	0.	0.	0.	0.	-.100	.000	.024
		WT02		0.	-73536.	0.	0.	0.	0.	-.101	.000	.026
		THRM01		0.	-4196.	0.	0.	0.	0.	1.563	.000	2.056
CV1	SPD		CV1-SPR									
		WT01		0.	-54653.	0.	0.	0.	0.	-.095	.000	.019
		WT02		0.	-43472.	0.	0.	0.	0.	-.100	.000	.021
		THRM01								1.352	-.405	1.504
GA6	ANC		TRBN NOZZLE									
		WT01		144.	-26791.	241.	66521.	-3063.	-3343.	.000	.000	.000
		WT02		143.	-26807.	244.	66376.	-3134.	-3371.	.000	.000	.000
		THRM01		-679.	1503.	317.	-15130.	-41279.	563.	.170	.460	.210
B05	ANC		X-7B									
		WT01		-12.	-10539.	-5.	28884.	-643.	-274.	.000	.000	.000
		WT02		-13.	-10371.	-5.	28283.	-650.	226.	.000	.000	.000
		THRM01		-866.	19966.	-601.	-213573.	-18202.	9155.	.000	.000	.000
B15	SPR		1DB-H14									
		WT01		0.	4.	0.	0.	0.	0.	.000	.003	-.013
		WT02		0.	0.	0.	0.	0.	0.	-.003	.000	-.010
		THRM01								-.067	.733	.606

Calc. 1-1 R1
Att. 2, p. 77

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
B20	SPR	1DB-H15									
		WT01	0.	22.	0.	0.	0.	0.	-.010	.007	-.013
		WT02	0.	0.	0.	0.	0.	0.	-.013	.000	-.010
		THRM01							-.168	.220	1.893
B35	RAD	1DB-H26									
		WT01	0.	-1527.	0.	0.	0.	0.	-.013	.000	-.011
		WT02	0.	-2305.	0.	0.	0.	0.	-.017	.000	-.007
		THRM01	0.	1581.	0.	0.	0.	0.	.231	.000	2.229
B40	RAD	1DB-H16									
		WT01	0.	-8543.	0.	0.	0.	0.	-.013	.000	-.007
		WT02	0.	-8158.	0.	0.	0.	0.	-.017	.000	-.003
		THRM01	0.	-506.	0.	0.	0.	0.	.801	.000	1.967
B45	RAD	1DB-H17									
		WT01	0.	-10309.	0.	0.	0.	0.	-.013	.000	.004
		WT02	0.	-10511.	0.	0.	0.	0.	-.017	.000	.007
		THRM01	0.	73.	0.	0.	0.	0.	2.280	.000	1.129
B50	RAD	1GB-H18									
		WT01	0.	-12610.	0.	0.	0.	0.	-.013	.000	.017
		WT02	0.	-11946.	0.	0.	0.	0.	-.017	.000	.020
		THRM01	0.	-153.	0.	0.	0.	0.	3.842	.000	.274
B55	RAD	1DB-H19									
		WT01	0.	-5973.	0.	0.	0.	0.	-.013	.000	.037
		WT02	0.	-7059.	0.	0.	0.	0.	-.017	.000	.038
		THRM01	0.	257.	0.	0.	0.	0.	5.403	.000	-.187
B70	SPR	1DB-H20									
		WT01	0.	519.	0.	0.	0.	0.	-.020	.173	.050
		WT02	0.	212.	0.	0.	0.	0.	-.024	.071	.050
		THRM01							5.956	.010	.178
B75	SPR	1DB-H21									
		WT01	0.	1041.	0.	0.	0.	0.	-.053	.260	.050
		WT02	0.	109.	0.	0.	0.	0.	-.056	.027	.050
		THRM01							4.802	.042	1.442
B80	SPR	1DB-H22									
		WT01	0.	487.	0.	0.	0.	0.	-.087	.162	.050
		WT02	0.	-164.	0.	0.	0.	0.	-.088	-.055	.050
		THRM01							3.386	.096	2.705

Calc. 1-1 R2
App 2, p. 78

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD	TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
B95	SPR		1DB-H23									
		WT01		0.	73.	0.	0.	0.	0.	-.091	.030	.034
		WT02		0.	-42.	0.	0.	0.	0.	-.092	-.017	.036
		THRM01								2.512	.049	2.161
CV2	SPD		CV2-SPR									
		WT01		0.	-51837.	0.	0.	0.	0.	-.089	.000	.014
		WT02		0.	-41818.	0.	0.	0.	0.	-.093	.000	.015
		THRM01								1.629	-.391	1.222
GB5	ANC		TRBN NOZZLE									
		WT01		-133.	-21425.	-1.	711.	-843.	-15418.	.000	.000	.000
		WT02		-138.	-21437.	-2.	780.	-882.	-15545.	.000	.000	.000
		THRM01		1066.	1164.	1065.	-31588.	-58610.	56152.	.170	-.030	.080
C05	ANC		~~X-7D~~ X-7C									
		WT01		-16.	-10860.	-6.	30056.	-819.	-115.	.000	.000	.000
		WT02		-16.	-10604.	-6.	29132.	-788.	296.	.000	.000	.000
		THRM01		-1151.	19557.	-681.	-212067.	-31505.	12439.	.000	.000	.000
C15	SPR		1DB-H24									
		WT01		0.	14.	0.	0.	0.	0.	-.002	.010	-.020
		WT02		0.	7.	0.	0.	0.	0.	-.003	.005	-.015
		THRM01								-.116	.740	.598
C20	SPR		1DB-H25									
		WT01		0.	119.	0.	0.	0.	0.	-.014	.037	-.020
		WT02		0.	65.	0.	0.	0.	0.	-.016	.020	-.015
		THRM01								-.421	.285	1.865
C35	RAD		1DB-H27									
		WT01		0.	-4866.	0.	0.	0.	0.	-.020	.000	-.017
		WT02		0.	-5345.	0.	0.	0.	0.	-.023	.000	-.012
		THRM01		0.	1075.	0.	0.	0.	0.	-.130	.000	2.407
C40	RAD		1DB-H28									
		WT01		0.	-9368.	0.	0.	0.	0.	-.020	.000	-.009
		WT02		0.	-9474.	0.	0.	0.	0.	-.023	.000	-.004
		THRM01		0.	-77.	0.	0.	0.	0.	.941	.000	1.898
C45	RAD		1DB-H29									
		WT01		0.	-12187.	0.	0.	0.	0.	-.020	.000	.003
		WT02		0.	-11256.	0.	0.	0.	0.	-.023	.000	.007
		THRM01		0.	-219.	0.	0.	0.	0.	2.500	.000	.941

Calc. 1-1 R. App. 2, p. 14

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD	TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
C50	RAD		1GB-H30									
		WT01		0.	-9620.	0.	0.	0.	0.	-.020	.000	.018
		WT02		0.	-10872.	0.	0.	0.	0.	-.023	.000	.021
		THRM01		0.	309.	0.	0.	0.	0.	4.061	.000	.098
C60	SPR		1DB-H31									
		WT01		0.	1039.	0.	0.	0.	0.	-.020	.346	.039
		WT02		0.	320.	0.	0.	0.	0.	-.023	.107	.041
		THRM01								5.623	.061	-.209
C70	SPR		1DB-H32									
		WT01		0.	881.	0.	0.	0.	0.	-.030	.408	.045
		WT02		0.	242.	0.	0.	0.	0.	-.033	.112	.047
		THRM01								5.623	.065	.300
C75	SPR		1DB-H33									
		WT01		0.	869.	0.	0.	0.	0.	-.056	.290	.045
		WT02		0.	119.	0.	0.	0.	0.	-.057	.040	.047
		THRM01								4.647	.062	1.276
C80	SPR		1DB-H34									
		WT01		0.	305.	0.	0.	0.	0.	-.082	.141	.045
		WT02		0.	-27.	0.	0.	0.	0.	-.083	-.012	.047
		THRM01								3.492	.074	2.271
C95	SPR		1DB-H35									
		WT01		0.	81.	0.	0.	0.	0.	-.086	.034	.034
		WT02		0.	-22.	0.	0.	0.	0.	-.088	-.009	.036
		THRM01								2.772	.037	1.903
CV3	SPD		CV3-SPR									
		WT01		0.	-51796.	0.	0.	0.	0.	-.085	.000	.020
		WT02		0.	-42386.	0.	0.	0.	0.	-.089	.000	.021
		THRM01								1.870	-.393	.948
GC5	ANC		TRBN NOZZLE									
		WT01		-121.	-21421.	24.	-1404.	-1047.	-15060.	.000	.000	.000
		WT02		-113.	-21438.	26.	-1502.	-1135.	-14834.	.000	.000	.000
		THRM01		2572.	919.	951.	-26706.	-58842.	99197.	.170	-.030	-.080
D05	ANC		X-7C X-7D									
		WT01		-35.	-10991.	-10.	30542.	-1830.	-3525.	.000	.000	.000
		WT02		-35.	-10754.	-10.	29688.	-1775.	-3162.	.000	.000	.000
		THRM01		-1464.	19163.	-756.	-210619.	-47520.	15512.	.000	.000	.000

Calc. 1-1 R.1
NP.2, P.90

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
D15	SPR	1DB-H36									
		WT01	0.	19.	0.	0.	0.	0.	.013	.013	-.023
		WT02	0.	12.	0.	0.	0.	0.	.011	.008	-.018
		THRM01							-.173	.747	.590
D20	SPR	1DB-H37									
		WT01	0.	243.	0.	0.	0.	0.	-.004	.081	-.023
		WT02	0.	189.	0.	0.	0.	0.	-.006	.063	-.018
		THRM01							-.734	.341	1.857
D25	SPR	1DB-H38									
		WT01	0.	193.	0.	0.	0.	0.	-.014	.080	-.023
		WT02	0.	166.	0.	0.	0.	0.	-.016	.069	-.018
		THRM01							-.952	.078	2.493
D35	RAD	1DB-H39									
		WT01	0.	-2618.	0.	0.	0.	0.	-.016	.000	-.017
		WT02	0.	-2864.	0.	0.	0.	0.	-.018	.000	-.012
		THRM01	0.	1153.	0.	0.	0.	0.	-.285	.000	2.474
D40	RAD	1DB-H40									
		WT01	0.	-10655.	0.	0.	0.	0.	-.016	.000	-.009
		WT02	0.	-10815.	0.	0.	0.	0.	-.018	.000	-.005
		THRM01	0.	-295.	0.	0.	0.	0.	.752	.000	1.949
D45	RAD	1DB-H41									
		WT01	0.	-11921.	0.	0.	0.	0.	-.016	.000	.001
		WT02	0.	-10844.	0.	0.	0.	0.	-.018	.000	.005
		THRM01	0.	-199.	0.	0.	0.	0.	2.316	.000	.927
D50	RAD	1GB-H42									
		WT01	0.	-9816.	0.	0.	0.	0.	-.016	.000	.014
		WT02	0.	-11358.	0.	0.	0.	0.	-.018	.000	.017
		THRM01	0.	330.	0.	0.	0.	0.	3.878	.000	.046
D60	SPR	1DB-H43									
		WT01	0.	973.	0.	0.	0.	0.	-.016	.324	.037
		WT02	0.	177.	0.	0.	0.	0.	-.018	.059	.039
		THRM01							5.439	.064	-.230
D70	SPR	1DB-H44									
		WT01	0.	684.	0.	0.	0.	0.	-.024	.317	.040
		WT02	0.	82.	0.	0.	0.	0.	-.026	.038	.043
		THRM01							5.379	.064	.130

Calc. 1-1 R.1
Att. 2, p. 81

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD	TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
D75	SPR		1DB-H45									
		WT01		0.	372.	0.	0.	0.	0.	-.051	.172	.040
		WT02		0.	-65.	0.	0.	0.	0.	-.052	-.030	.043
		THRM01								4.542	.060	.984
D80	SPR		1DB-H46									
		WT01		0.	104.	0.	0.	0.	0.	-.075	.065	.040
		WT02		0.	-62.	0.	0.	0.	0.	-.075	-.038	.043
		THRM01								3.683	.067	1.742
D95	SPR		1DB-H47									
		WT01		0.	32.	0.	0.	0.	0.	-.082	.013	.033
		WT02		0.	-43.	0.	0.	0.	0.	-.082	-.018	.035
		THRM01								3.056	.042	1.624
MS4	RAD		MS-4									
		WT01		0.	-67447.	0.	0.	0.	0.	-.079	.000	.024
		WT02		0.	-77996.	0.	0.	0.	0.	-.080	.000	.026
		THRM01		0.	-621.	0.	0.	0.	0.	2.698	.000	.946
CV4	SPD		CV4-SPR									
		WT01		0.	-50451.	0.	0.	0.	0.	-.082	.000	.014
		WT02		0.	-42432.	0.	0.	0.	0.	-.084	.000	.015
		THRM01								2.171	-.390	.688
GD6	ANC		TRBN NOZZLE									
		WT01		180.	-26818.	-241.	-66546.	1725.	-2375.	.000	.000	.000
		WT02		181.	-26830.	-242.	-66448.	1697.	-2364.	.000	.000	.000
		THRM01		1160.	493.	235.	-5706.	-39468.	50502.	.170	.460	-.210
110	SPR		7DB-H79									
		WT01		0.	230.	0.	0.	0.	0.	-.130	.143	.045
		WT02		0.	-32.	0.	0.	0.	0.	-.095	-.020	.044
		THRM01								2.493	.164	2.729
120	SPR		7DB-H77									
		WT01		0.	140.	0.	0.	0.	0.	-.158	.065	.033
		WT02		0.	38.	0.	0.	0.	0.	-.102	.018	.040
		THRM01								1.373	.074	2.949
125	SPR		7DB-H76									
		WT01		0.	100.	0.	0.	0.	0.	-.193	.083	.033
		WT02		0.	52.	0.	0.	0.	0.	-.108	.043	.040
		THRM01								.503	.034	3.793

Calc. 1-1 R 1
App. 2, p. 82

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD	TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
145	RAD		BYPS VV SPPT									
		WT01		0.	-26689.	0.	0.	0.	0.	-.194	.000	.026
		WT02		0.	-26809.	0.	0.	0.	0.	-.108	.000	.039
		THRM01		0.	-314.	0.	0.	0.	0.	.300	.000	3.619
146	RAD		BYPS VV SPPT									
		WT01		0.	-30023.	0.	0.	0.	0.	-.175	.000	.026
		WT02		0.	-30038.	0.	0.	0.	0.	-.101	.000	.039
		THRM01		0.	509.	0.	0.	0.	0.	.746	.000	3.186
165	SPR		7DB-H74									
		WT01		0.	9.	0.	0.	0.	0.	-.181	.006	.025
		WT02		0.	-29.	0.	0.	0.	0.	-.105	-.018	.034
		THRM01								1.308	.119	2.877
180	SPR		7DB-H75									
		WT01		0.	-104.	0.	0.	0.	0.	-.113	-.065	.025
		WT02		0.	-150.	0.	0.	0.	0.	-.084	-.094	.034
		THRM01								2.598	.190	1.624
250	SPR		7DB-H78									
		WT01		0.	33.	0.	0.	0.	0.	-.104	.028	.038
		WT02		0.	-52.	0.	0.	0.	0.	-.089	-.043	.042
		THRM01								2.759	.138	1.902
MS2	SPD		MS2-MS3 SPR									
		WT01		0.	-229593.	0.	0.	0.	0.	-.089	.000	.024
		WT02		0.	-263967.	0.	0.	0.	0.	-.090	.000	.026
		THRM01								2.110	-.006	1.491
AR5	RAD		REST-5									
		WT01		0.	-5360.	0.	0.	0.	0.	.000	.000	.002
		WT02		0.	-6065.	0.	0.	0.	0.	.000	.000	.002
		THRM01		0.	-21700.	0.	0.	0.	0.	-.002	.000	.552
BR5	RAD		REST-5									
		WT01		0.	-4597.	0.	0.	0.	0.	-.001	.000	.002
		WT02		0.	-5426.	0.	0.	0.	0.	.000	.000	.002
		THRM01		0.	-21078.	0.	0.	0.	0.	-.008	.000	.553
CR5	RAD		REST-5									
		WT01		0.	-3825.	0.	0.	0.	0.	-.001	.000	.002
		WT02		0.	-4854.	0.	0.	0.	0.	.000	.000	.002
		THRM01		0.	-20523.	0.	0.	0.	0.	-.017	.000	.553

Calc 1-1 R.1
App. 2, p. 93

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD	TITLE	GLOBAL FORCES (LB) FX	FY	FZ	GLOBAL MOMENTS (FT-LB) MX	MY	MZ	DISPLACEMENT (IN) DX	DY	DZ
DR5	RAD		REST-5									
		WT01		0.	-3844.	0.	0.	0.	0.	-.003	.000	.003
		WT02		0.	-4796.	0.	0.	0.	0.	-.003	.000	.002
		THRM01		0.	-20013.	0.	0.	0.	0.	-.029	.000	.553

Calc. 1-1 R.1
App. 2, p. 34

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	LOCAL FORCES(LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	CC C
A05	ANC	X-7A															
		WT01	-3	10243	-6	420	377	27806	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0
		WT02	-4	10129	-9	653	433	27399	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0
		THRM01	-528	-20416	-638	6665	8515	-215228	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0
A15	SPR	1DB-H1															
		WT01	-5	0	0	0	0	0	.00	1.00	.00						
		WT02	-8	0	0	0	0	0	.00	1.00	.00						
		THRM01															
A20	SPR	1DB-H2															
		WT01	-30	0	0	0	0	0	.00	1.00	.00						
		WT02	-35	0	0	0	0	0	.00	1.00	.00						
		THRM01															
A35	RAD	1DB-H3															
		WT01	-1865	0	0	0	0	0	.00	1.00	.00						
		WT02	-2160	0	0	0	0	0	.00	1.00	.00						
		THRM01	1726	0	0	0	0	0	.00	1.00	.00						
A40	RAD	1DB-H4															
		WT01	-8561	0	0	0	0	0	.00	1.00	.00						
		WT02	-8533	0	0	0	0	0	.00	1.00	.00						
		THRM01	-470	0	0	0	0	0	.00	1.00	.00						
A45	RAD	1DB-H5															
		WT01	-11154	0	0	0	0	0	.00	1.00	.00						
		WT02	-10944	0	0	0	0	0	.00	1.00	.00						
		THRM01	51	0	0	0	0	0	.00	1.00	.00						
A50	RAD	1GB-H6															
		WT01	-10549	0	0	0	0	0	.00	1.00	.00						
		WT02	-11352	0	0	0	0	0	.00	1.00	.00						
		THRM01	-95	0	0	0	0	0	.00	1.00	.00						
A55	RAD	1DB-H7															
		WT01	-10817	0	0	0	0	0	.00	1.00	.00						
		WT02	-8167	0	0	0	0	0	.00	1.00	.00						
		THRM01	137	0	0	0	0	0	.00	1.00	.00						
A70	RAD	1DB-H9															
		WT01	-5733	0	0	0	0	0	.00	1.00	.00						
		WT02	-8975	0	0	0	0	0	.00	1.00	.00						
		THRM01	73	0	0	0	0	0	.00	1.00	.00						

Calc. 1-1 R.1
Att. 2, p. 85

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	CC C
A75	SPR	1DB-H10															
		WT01	457	0	0	0	0	0	.00	1.00	.00						
		WT02	-246	0	0	0	0	0	.00	1.00	.00						
		THRM01															
A80	SPR	1DB-H11															
		WT01	598	0	0	0	0	0	.00	1.00	.00						
		WT02	-146	0	0	0	0	0	.00	1.00	.00						
		THRM01															
A85	SPR	1DB-H12															
		WT01	921	0	0	0	0	0	.00	1.00	.00						
		WT02	-110	0	0	0	0	0	.00	1.00	.00						
		THRM01															
A95	SPR	1DB-H13															
		WT01	122	0	0	0	0	0	.00	1.00	.00						
		WT02	-23	0	0	0	0	0	.00	1.00	.00						
		THRM01															
MS1	RAD	MS-1															
		WT01	-62134	0	0	0	0	0	.00	1.00	.00						
		WT02	-73536	0	0	0	0	0	.00	1.00	.00						
		THRM01	-4196	0	0	0	0	0	.00	1.00	.00						
CV1	SPD	CV1-SPR															
		WT01	-54653	0	0	0	0	0	.00	1.00	.00						
		WT02	-43472	0	0	0	0	0	.00	1.00	.00						
		THRM01															
GA6	ANC	TRBN NOZZLE															
		WT01	144	-26791	241	66521	-3063	-3343	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
		WT02	143	-26807	244	66376	-3134	-3371	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
		THRM01	-679	1503	317	-15130	-41279	563	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
B05	ANC	X-7B															
		WT01	-5	10539	-12	-274	643	28884	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0
		WT02	-5	10371	-13	226	650	28283	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0
		THRM01	-601	-19966	-866	9155	18202	-213573	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0
B15	SPR	1DB-H14															
		WT01	4	0	0	0	0	0	.00	1.00	.00						
		WT02	0	0	0	0	0	0	.00	1.00	.00						
		THRM01															

Calc. 1-1 R.1
App. 2, p 86

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	LOCAL FORCES(LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	CC C
B20	SPR	1DB-H15															
		WT01	22	0	0	0	0	0	.00	1.00	.00						
		WT02	0	0	0	0	0	0	.00	1.00	.00						
		THRM01															
B35	RAD	1DB-H26															
		WT01	-1527	0	0	0	0	0	.00	1.00	.00						
		WT02	-2305	0	0	0	0	0	.00	1.00	.00						
		THRM01	1581	0	0	0	0	0	.00	1.00	.00						
B40	RAD	1DB-H16															
		WT01	-8543	0	0	0	0	0	.00	1.00	.00						
		WT02	-8158	0	0	0	0	0	.00	1.00	.00						
		THRM01	-506	0	0	0	0	0	.00	1.00	.00						
B45	RAD	1DB-H17															
		WT01	-10309	0	0	0	0	0	.00	1.00	.00						
		WT02	-10511	0	0	0	0	0	.00	1.00	.00						
		THRM01	73	0	0	0	0	0	.00	1.00	.00						
B50	RAD	1GB-H18															
		WT01	-12610	0	0	0	0	0	.00	1.00	.00						
		WT02	-11946	0	0	0	0	0	.00	1.00	.00						
		THRM01	-153	0	0	0	0	0	.00	1.00	.00						
B55	RAD	1DB-H19															
		WT01	-5973	0	0	0	0	0	.00	1.00	.00						
		WT02	-7059	0	0	0	0	0	.00	1.00	.00						
		THRM01	257	0	0	0	0	0	.00	1.00	.00						
B70	SPR	1DB-H20															
		WT01	519	0	0	0	0	0	.00	1.00	.00						
		WT02	212	0	0	0	0	0	.00	1.00	.00						
		THRM01															
B75	SPR	1DB-H21															
		WT01	1041	0	0	0	0	0	.00	1.00	.00						
		WT02	109	0	0	0	0	0	.00	1.00	.00						
		THRM01															
B80	SPR	1DB-H22															
		WT01	487	0	0	0	0	0	.00	1.00	.00						
		WT02	-164	0	0	0	0	0	.00	1.00	.00						
		THRM01															

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	LOCAL FORCES(LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	C((
B95	SPR	1DB-H23															
		WT01	73	0	0	0	0	0	.00	1.00	.00						
		WT02	-42	0	0	0	0	0	.00	1.00	.00						
		THRM01															
CV2	SPD	CV2-SPR															
		WT01	-51837	0	0	0	0	0	.00	1.00	.00						
		WT02	-41818	0	0	0	0	0	.00	1.00	.00						
		THRM01															
GB5	ANC	TRBN NOZZLE															
		WT01	-133	-21425	-1	711	-843	-15418	1.00	.00	.00	.00	1.00	.00	.00	.00	1.(
		WT02	-138	-21437	-2	780	-882	-15545	1.00	.00	.00	.00	1.00	.00	.00	.00	1.(
		THRM01	1066	1164	1065	-31588	-58610	56152	1.00	.00	.00	.00	1.00	.00	.00	.00	1.(
C05	ANC	~~X-7D~~ X-7C															
		WT01	-6	10860	-16	-115	819	30056	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.(
		WT02	-6	10604	-16	296	788	29132	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.(
		THRM01	-681	-19557	-1151	12439	31505	-212067	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.(
C15	SPR	1DB-H24															
		WT01	14	0	0	0	0	0	.00	1.00	.00						
		WT02	7	0	0	0	0	0	.00	1.00	.00						
		THRM01															
C20	SPR	1DB-H25															
		WT01	119	0	0	0	0	0	.00	1.00	.00						
		WT02	65	0	0	0	0	0	.00	1.00	.00						
		THRM01															
C35	RAD	1DB-H27															
		WT01	-4866	0	0	0	0	0	.00	1.00	.00						
		WT02	-5345	0	0	0	0	0	.00	1.00	.00						
		THRM01	1075	0	0	0	0	0	.00	1.00	.00						
C40	RAD	1DB-H28															
		WT01	-9368	0	0	0	0	0	.00	1.00	.00						
		WT02	-9474	0	0	0	0	0	.00	1.00	.00						
		THRM01	-77	0	0	0	0	0	.00	1.00	.00						
C45	RAD	1DB-H29															
		WT01	-12187	0	0	0	0	0	.00	1.00	.00						
		WT02	-11256	0	0	0	0	0	.00	1.00	.00						
		THRM01	-219	0	0	0	0	0	.00	1.00	.00						

Calc. 1-1 R. 1
App. 2, p. 93

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD	TITLE	LOCAL FORCES (LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	CO C
C50	RAD		1GB-H30															
		WT01		-9620	0	0	0	0	0	.00	1.00	.00						
		WT02		-10872	0	0	0	0	0	.00	1.00	.00						
		THRM01		309	0	0	0	0	0	.00	1.00	.00						
C60	SPR		1DB-H31															
		WT01		1039	0	0	0	0	0	.00	1.00	.00						
		WT02		320	0	0	0	0	0	.00	1.00	.00						
		THRM01																
C70	SPR		1DB-H32															
		WT01		881	0	0	0	0	0	.00	1.00	.00						
		WT02		242	0	0	0	0	0	.00	1.00	.00						
		THRM01																
C75	SPR		1DB-H33															
		WT01		869	0	0	0	0	0	.00	1.00	.00						
		WT02		119	0	0	0	0	0	.00	1.00	.00						
		THRM01																
C80	SPR		1DB-H34															
		WT01		305	0	0	0	0	0	.00	1.00	.00						
		WT02		-27	0	0	0	0	0	.00	1.00	.00						
		THRM01																
C95	SPR		1DB-H35															
		WT01		81	0	0	0	0	0	.00	1.00	.00						
		WT02		-22	0	0	0	0	0	.00	1.00	.00						
		THRM01																
CV3	SPD		CV3-SPR															
		WT01		-51796	0	0	0	0	0	.00	1.00	.00						
		WT02		-42386	0	0	0	0	0	.00	1.00	.00						
		THRM01																
GC5	ANC		TRBN NOZZLE															
		WT01		-121	-21421	24	-1404	-1047	-15060	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
		WT02		-113	-21438	26	-1502	-1135	-14834	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
		THRM01		2572	919	951	-26706	-58842	99197	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
D05	ANC		~~X-7C~~ X-7D															
		WT01		-10	10991	-35	-3525	1830	30542	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0
		WT02		-10	10754	-35	-3162	1775	29688	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0
		THRM01		-756	-19163	-1464	15512	47520	-210619	.00	.00	1.00	.00	-1.00	.00	1.00	.00	.0

Calc-1-1 R2
App. 2, p. 8

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	LOCAL FORCES(LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	CC C
D15	SPR	1DB-H36															
		WT01	19	0	0	0	0	0	.00	1.00	.00						
		WT02	12	0	0	0	0	0	.00	1.00	.00						
		THRM01															
D20	SPR	1DB-H37															
		WT01	243	0	0	0	0	0	.00	1.00	.00						
		WT02	189	0	0	0	0	0	.00	1.00	.00						
		THRM01															
D25	SPR	1DB-H38															
		WT01	193	0	0	0	0	0	.00	1.00	.00						
		WT02	166	0	0	0	0	0	.00	1.00	.00						
		THRM01															
D35	RAD	1DB-H39															
		WT01	-2618	0	0	0	0	0	.00	1.00	.00						
		WT02	-2864	0	0	0	0	0	.00	1.00	.00						
		THRM01	1153	0	0	0	0	0	.00	1.00	.00						
D40	RAD	1DB-H40															
		WT01	-10655	0	0	0	0	0	.00	1.00	.00						
		WT02	-10815	0	0	0	0	0	.00	1.00	.00						
		THRM01	-295	0	0	0	0	0	.00	1.00	.00						
D45	RAD	1DB-H41															
		WT01	-11921	0	0	0	0	0	.00	1.00	.00						
		WT02	-10844	0	0	0	0	0	.00	1.00	.00						
		THRM01	-199	0	0	0	0	0	.00	1.00	.00						
D50	RAD	1GB-H42															
		WT01	-9816	0	0	0	0	0	.00	1.00	.00						
		WT02	-11358	0	0	0	0	0	.00	1.00	.00						
		THRM01	330	0	0	0	0	0	.00	1.00	.00						
D60	SPR	1DB-H43															
		WT01	973	0	0	0	0	0	.00	1.00	.00						
		WT02	177	0	0	0	0	0	.00	1.00	.00						
		THRM01															
D70	SPR	1DB-H44															
		WT01	684	0	0	0	0	0	.00	1.00	.00						
		WT02	82	0	0	0	0	0	.00	1.00	.00						
		THRM01															

Calc. 1-1 R1
App. 2, p. 9

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	LOCAL FORCES(LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	CC C
D75	SPR	1DB-H45															
		WT01	372	0	0	0	0	0	.00	1.00	.00						
		WT02	-65	0	0	0	0	0	.00	1.00	.00						
		THRM01															
D80	SPR	1DB-H46															
		WT01	104	0	0	0	0	0	.00	1.00	.00						
		WT02	-62	0	0	0	0	0	.00	1.00	.00						
		THRM01															
D95	SPR	1DB-H47															
		WT01	32	0	0	0	0	0	.00	1.00	.00						
		WT02	-43	0	0	0	0	0	.00	1.00	.00						
		THRM01															
MS4	RAD	MS-4															
		WT01	-67447	0	0	0	0	0	.00	1.00	.00						
		WT02	-77996	0	0	0	0	0	.00	1.00	.00						
		THRM01	-621	0	0	0	0	0	.00	1.00	.00						
CV4	SPD	CV4-SPR															
		WT01	-50451	0	0	0	0	0	.00	1.00	.00						
		WT02	-42432	0	0	0	0	0	.00	1.00	.00						
		THRM01															
GD6	ANC	TRBN NOZZLE															
		WT01	180	-26818	-241	-66546	1725	-2375	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
		WT02	181	-26830	-242	-66448	1697	-2364	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
		THRM01	1160	493	235	-5706	-39468	50502	1.00	.00	.00	.00	1.00	.00	.00	.00	1.0
110	SPR	7DB-H79															
		WT01	230	0	0	0	0	0	.00	1.00	.00						
		WT02	-32	0	0	0	0	0	.00	1.00	.00						
		THRM01															
120	SPR	7DB-H77															
		WT01	140	0	0	0	0	0	.00	1.00	.00						
		WT02	38	0	0	0	0	0	.00	1.00	.00						
		THRM01															
125	SPR	7DB-H76															
		WT01	100	0	0	0	0	0	.00	1.00	.00						
		WT02	52	0	0	0	0	0	.00	1.00	.00						
		THRM01															

Calc. 1-1 R.1
AIP. 2, P 91

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD TITLE	LOCAL FORCES(LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	CC C
145	RAD	BYPS VV SPPT															
		WT01	-26689	0	0	0	0	0	.00	1.00	.00						
		WT02	-26809	0	0	0	0	0	.00	1.00	.00						
		THRM01	-314	0	0	0	0	0	.00	1.00	.00						
146	RAD	BYPS VV SPPT															
		WT01	-30023	0	0	0	0	0	.00	1.00	.00						
		WT02	-30038	0	0	0	0	0	.00	1.00	.00						
		THRM01	509	0	0	0	0	0	.00	1.00	.00						
165	SPR	7DB-H74															
		WT01	9	0	0	0	0	0	.00	1.00	.00						
		WT02	-29	0	0	0	0	0	.00	1.00	.00						
		THRM01															
180	SPR	7DB-H75															
		WT01	-104	0	0	0	0	0	.00	1.00	.00						
		WT02	-150	0	0	0	0	0	.00	1.00	.00						
		THRM01															
250	SPR	7DB-H78															
		WT01	33	0	0	0	0	0	.00	1.00	.00						
		WT02	-52	0	0	0	0	0	.00	1.00	.00						
		THRM01															
MS2	SPD	MS2-MS3 SPR															
		WT01	-229593	0	0	0	0	0	.00	1.00	.00						
		WT02	-263967	0	0	0	0	0	.00	1.00	.00						
		THRM01															
AR5	RAD	REST-5															
		WT01	-5360	0	0	0	0	0	.00	1.00	.00						
		WT02	-6065	0	0	0	0	0	.00	1.00	.00						
		THRM01	-21700	0	0	0	0	0	.00	1.00	.00						
BR5	RAD	REST-5															
		WT01	-4597	0	0	0	0	0	.00	1.00	.00						
		WT02	-5426	0	0	0	0	0	.00	1.00	.00						
		THRM01	-21078	0	0	0	0	0	.00	1.00	.00						
CR5	RAD	REST-5															
		WT01	-3825	0	0	0	0	0	.00	1.00	.00						
		WT02	-4854	0	0	0	0	0	.00	1.00	.00						
		THRM01	-20523	0	0	0	0	0	.00	1.00	.00						

Calc 1-1 Rev. 1
App. 2, p. 92

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASE :

DATA PT	TYPE	LOAD	TITLE	LOCAL FORCES(LB) FA	FB	FC	LOCAL MOMENTS (FT-LB) MA	MB	MC	DIRECTION COSINES COS AX	COS AY	COS AZ	COS BX	COS BY	COS BZ	COS CX	COS CY	C(
DR5	RAD	REST-5																
		WT01		-3844	0	0	0	0	0	.00	1.00	.00						
		WT02		-4796	0	0	0	0	0	.00	1.00	.00						
		THRM01		-20013	0	0	0	0	0	.00	1.00	.00						
ME101LC		Version N2		stop on 09/26/03 at 02:24:48														
ME101LC		Version N2		run time .25 seconds														
ME101SA		Version N2		start on 09/26/03 at 02:24:48														

Calc. 1-1 R.1
App 2, p. 93

TITLE : U3 MAIN STEAM LINES O/C
PROJECT NUMBER : 03-00525
PROBLEM NUMBER : 1-1
USER : KAZOUN
LOAD CASES : ALL

CODE B31S73

ELEMENT FROM	ELEMENT TYPE TO	TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
A05		TNGT	6803	7506	15000	0	0	0	0	0	0	0	5965	22500	0	0
A06				7234	15000		0	0	0	0	0	0	3082	22500	0	0
A06		TNGT	6803	7234	15000	0	0	0	0	0	0	0	3082	22500	0	0
A07				7092	15000		0	0	0	0	0	0	7687	22500	0	0
A07		TNGT	6803	7092	15000	0	0	0	0	0	0	0	7687	22500	0	0
A07A				6855	15000		0	0	0	0	0	0	1086	22500	0	0
A07A		TNGT	6803	6855	15000	0	0	0	0	0	0	0	1086	22500	0	0
A07B				6856	15000		0	0	0	0	0	0	1137	22500	0	0
A07B		TNGT	6803	6856	15000	0	0	0	0	0	0	0	1137	22500	0	0
A10 B				6856	15000		0	0	0	0	0	0	1193	22500	0	0
A10 B		BEND	6803	6896	15000	0	0	0	0	0	0	0	2811	22500	0	0
A10 M				6983	15000		0	0	0	0	0	0	2814	22500	0	0
A10 M		BEND	6803	6983	15000	0	0	0	0	0	0	0	2814	22500	0	0
A10 E				7261	15000		0	0	0	0	0	0	2670	22500	0	0
A10 E		TNGT	6803	7062	15000	0	0	0	0	0	0	0	1134	22500	0	0
A15				7228	15000		0	0	0	0	0	0	1071	22500	0	0
A15		TNGT	6803	7228	15000	0	0	0	0	0	0	0	1071	22500	0	0
A15A				7084	15000		0	0	0	0	0	0	840	22500	0	0
A15A		TNGT	6803	7084	15000	0	0	0	0	0	0	0	840	22500	0	0
A15B				7359	15000		0	0	0	0	0	0	651	22500	0	0
A15B		TNGT	6803	7359	15000	0	0	0	0	0	0	0	651	22500	0	0
A15C				7203	15000		0	0	0	0	0	0	549	22500	0	0
A15C		TNGT	6803	7203	15000	0	0	0	0	0	0	0	549	22500	0	0
A20				6990	15000		0	0	0	0	0	0	583	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

calc. 1-1 R.1
App 2, p. 94

CODE B31S73

ELEMENT FROM	ELEMENT TO	TYPE	TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
A20		TNGT		6803	6990	15000	0	0	0	0	0	0	0	583	22500	0	0
A25					6904	15000		0	0	0	0	0	0	615	22500	0	0
A25		TNGT		6803	6904	15000	0	0	0	0	0	0	0	615	22500	0	0
A30	B				6844	15000		0	0	0	0	0	0	662	22500	0	0
A30	B	BEND		6803	6875	15000	0	0	0	0	0	0	0	1560	22500	0	0
A30	M				6853	15000		0	0	0	0	0	0	1645	22500	0	0
A30	M	BEND		6803	6853	15000	0	0	0	0	0	0	0	1645	22500	0	0
A30	E				6865	15000		0	0	0	0	0	0	1626	22500	0	0
A30	E	TNGT		6803	6838	15000	0	0	0	0	0	0	0	690	22500	0	0
A35					6935	15000		0	0	0	0	0	0	660	22500	0	0
A35		TNGT		6803	6935	15000	0	0	0	0	0	0	0	660	22500	0	0
A35A					6965	15000		0	0	0	0	0	0	596	22500	0	0
A35A		TNGT		6803	6965	15000	0	0	0	0	0	0	0	596	22500	0	0
A35B					7138	15000		0	0	0	0	0	0	535	22500	0	0
A35B		TNGT		6803	7138	15000	0	0	0	0	0	0	0	535	22500	0	0
A40					7454	15000		0	0	0	0	0	0	480	22500	0	0
A40		TNGT		6803	7454	15000	0	0	0	0	0	0	0	480	22500	0	0
A40A					6848	15000		0	0	0	0	0	0	404	22500	0	0
A40A		TNGT		6803	6848	15000	0	0	0	0	0	0	0	404	22500	0	0
A40B					7228	15000		0	0	0	0	0	0	334	22500	0	0
A40B		TNGT		6803	7228	15000	0	0	0	0	0	0	0	334	22500	0	0
A40C					7331	15000		0	0	0	0	0	0	272	22500	0	0
A40C		TNGT		6803	7331	15000	0	0	0	0	0	0	0	272	22500	0	0
A40D					7145	15000		0	0	0	0	0	0	225	22500	0	0
A40D		TNGT		6803	7145	15000	0	0	0	0	0	0	0	225	22500	0	0
A40E					6942	15000		0	0	0	0	0	0	206	22500	0	0
A40E		TNGT		6803	6942	15000	0	0	0	0	0	0	0	206	22500	0	0
A45					7704	15000		0	0	0	0	0	0	221	22500	0	0
A45		TNGT		6803	7704	15000	0	0	0	0	0	0	0	221	22500	0	0
A45A					6991	15000		0	0	0	0	0	0	264	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
Att. 2, p. 75

CODE B31S73

ELEMENT FROM	ELEMENT TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
A45A		TNGT	6803	6991	15000	0	0	0	0	0	0	0	264	22500	0	0
	A45B			7046	15000		0	0	0	0	0	0	324	22500	0	0
A45B		TNGT	6803	7046	15000	0	0	0	0	0	0	0	324	22500	0	0
	A45C			7179	15000		0	0	0	0	0	0	394	22500	0	0
A45C		TNGT	6803	7179	15000	0	0	0	0	0	0	0	394	22500	0	0
	A45D			7024	15000		0	0	0	0	0	0	469	22500	0	0
A45D		TNGT	6803	7024	15000	0	0	0	0	0	0	0	469	22500	0	0
	A45E			7034	15000		0	0	0	0	0	0	548	22500	0	0
A45E		TNGT	6803	7034	15000	0	0	0	0	0	0	0	548	22500	0	0
	A50			7769	15000		0	0	0	0	0	0	628	22500	0	0
A50		TNGT	6803	7769	15000	0	0	0	0	0	0	0	628	22500	0	0
	A50A			6962	15000		0	0	0	0	0	0	709	22500	0	0
A50A		TNGT	6803	6962	15000	0	0	0	0	0	0	0	709	22500	0	0
	A50B			7169	15000		0	0	0	0	0	0	791	22500	0	0
A50B		TNGT	6803	7169	15000	0	0	0	0	0	0	0	791	22500	0	0
	A50C			7399	15000		0	0	0	0	0	0	874	22500	0	0
A50C		TNGT	6803	7399	15000	0	0	0	0	0	0	0	874	22500	0	0
	A50D			7338	15000		0	0	0	0	0	0	958	22500	0	0
A50D		TNGT	6803	7338	15000	0	0	0	0	0	0	0	958	22500	0	0
	A50E			6989	15000		0	0	0	0	0	0	1042	22500	0	0
A50E		TNGT	6803	6989	15000	0	0	0	0	0	0	0	1042	22500	0	0
	A55			7263	15000		0	0	0	0	0	0	1126	22500	0	0
A55		TNGT	6803	7263	15000	0	0	0	0	0	0	0	1126	22500	0	0
	A60			6871	15000		0	0	0	0	0	0	1213	22500	0	0
A60		TNGT	6803	6871	15000	0	0	0	0	0	0	0	1213	22500	0	0
	A65 B			6851	15000		0	0	0	0	0	0	1292	22500	0	0
A65 B		BEND	6803	6888	15000	0	0	0	0	0	0	0	3043	22500	0	0
	A65 M			6894	15000		0	0	0	0	0	0	3078	22500	0	0
A65 M		BEND	6803	6894	15000	0	0	0	0	0	0	0	3078	22500	0	0
	A65 E			7038	15000		0	0	0	0	0	0	3020	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

calc. 1-1 R.1
Att. 2, p. 75

CODE B31S73

ELEMENT FROM	ELEMENT TO	ELEMENT TYPE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
A65 E	A65A	TNGT	6803	6936	15000	0	0	0	0	0	0	0	1282	22500	0	0
				7155	15000		0	0	0	0	0	0	1219	22500	0	0
A65A	A70	TNGT	6803	7155	15000	0	0	0	0	0	0	0	1219	22500	0	0
				7484	15000		0	0	0	0	0	0	1155	22500	0	0
A70	A70A	TNGT	6803	7484	15000	0	0	0	0	0	0	0	1155	22500	0	0
				6836	15000		0	0	0	0	0	0	1051	22500	0	0
A70A	A70B	TNGT	6803	6836	15000	0	0	0	0	0	0	0	1051	22500	0	0
				7187	15000		0	0	0	0	0	0	947	22500	0	0
A70B	A70C	TNGT	6803	7187	15000	0	0	0	0	0	0	0	947	22500	0	0
				7293	15000		0	0	0	0	0	0	843	22500	0	0
A70C	A70D	TNGT	6803	7293	15000	0	0	0	0	0	0	0	843	22500	0	0
				7118	15000		0	0	0	0	0	0	739	22500	0	0
A70D	A75	TNGT	6803	7118	15000	0	0	0	0	0	0	0	739	22500	0	0
				6952	15000		0	0	0	0	0	0	635	22500	0	0
A75	A75A	TNGT	6803	6952	15000	0	0	0	0	0	0	0	635	22500	0	0
				7098	15000		0	0	0	0	0	0	535	22500	0	0
A75A	A75B	TNGT	6803	7098	15000	0	0	0	0	0	0	0	535	22500	0	0
				7270	15000		0	0	0	0	0	0	435	22500	0	0
A75B	A75C	TNGT	6803	7270	15000	0	0	0	0	0	0	0	435	22500	0	0
				7177	15000		0	0	0	0	0	0	335	22500	0	0
A75C	A80	TNGT	6803	7177	15000	0	0	0	0	0	0	0	335	22500	0	0
				6836	15000		0	0	0	0	0	0	237	22500	0	0
A80	A80A	TNGT	6803	6836	15000	0	0	0	0	0	0	0	237	22500	0	0
				6846	15000		0	0	0	0	0	0	136	22500	0	0
A80A	A85	TNGT	6803	6846	15000	0	0	0	0	0	0	0	136	22500	0	0
				7065	15000		0	0	0	0	0	0	67	22500	0	0
A85	A88 B	TNGT	6803	7065	15000	0	0	0	0	0	0	0	67	22500	0	0
				6990	15000		0	0	0	0	0	0	67	22500	0	0
A88 B	A88 M	BEND	6803	7134	15000	0	0	0	0	0	0	0	157	22500	0	0
				6983	15000		0	0	0	0	0	0	209	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc 1-1 Rev. 7.1
Att. 2, p. 97

CODE B31S73

ELEMENT FROM	TO	TYPE	TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
A88 M		BEND		6803	6983	15000	0	0	0	0	0	0	0	209	22500	0	0
A88 E					7068	15000		0	0	0	0	0	0	293	22500	0	0
A88 E		TNGT		6803	6953	15000	0	0	0	0	0	0	0	125	22500	0	0
A90					7049	15000		0	0	0	0	0	0	268	22500	0	0
A90		TNGT		6803	7015	15000	0	0	0	0	0	0	0	218	22500	0	0
A90A					6917	15000		0	0	0	0	0	0	210	22500	0	0
A90A		TNGT		6803	6917	15000	0	0	0	0	0	0	0	210	22500	0	0
A95					7175	15000		0	0	0	0	0	0	309	22500	0	0
A95		TNGT		6803	7175	15000	0	0	0	0	0	0	0	309	22500	0	0
A95A					7021	15000		0	0	0	0	0	0	365	22500	0	0
A95A		TNGT		6803	7021	15000	0	0	0	0	0	0	0	365	22500	0	0
ASV					6994	15000		0	0	0	0	0	0	421	22500	0	0
ASV		TNGT		5866	5893	15000	0	0	0	0	0	0	0	59	22500	0	0
A97					5906	15000		0	0	0	0	0	0	67	22500	0	0
A97		TNGT		5866	6820	15000	0	0	0	0	0	0	0	55	22500	0	0
MS1					5866	15000		0	0	0	0	0	0	0	22500	0	0
MS1		TNGT		5866	5866	15000	0	0	0	0	0	0	0	0	22500	0	0
S02					5866	15000		0	0	0	0	0	0	0	22500	0	0
A97		TNGT		4198	4387	15000	0	0	0	0	0	0	0	363	22500	0	0
GA1					4859	15000		0	0	0	0	0	0	279	22500	0	0
GA1		TNGT		4198	4972	15000	0	0	0	0	0	0	0	0	22500	0	0
CV1					4198	15000		0	0	0	0	0	0	0	22500	0	0
GA1		TNGT		5421	5735	15000	0	0	0	0	0	0	0	721	22500	0	0
GA1A					5744	15000		0	0	0	0	0	0	674	22500	0	0
GA1A		TNGT		5421	5744	15000	0	0	0	0	0	0	0	674	22500	0	0
GA1B					5754	15000		0	0	0	0	0	0	632	22500	0	0
GA1B		TNGT		5421	5754	15000	0	0	0	0	0	0	0	632	22500	0	0
GA2 B					5766	15000		0	0	0	0	0	0	595	22500	0	0
GA2 B		BEND		5421	5949	15000	0	0	0	0	0	0	0	1214	22500	0	0
GA2 M					5769	15000		0	0	0	0	0	0	1164	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
A1P.2, P.98

CODE B31S73

ELEMENT FROM	ELEMENT TO	ELEMENT TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
GA2 M	BEND		5421	5769	15000	0	0	0	0	0	0	0	1164	22500	0	0
GA2 E				5559	15000		0	0	0	0	0	0	1117	22500	0	0
GA2 E	TNGT		5421	5511	15000	0	0	0	0	0	0	0	548	22500	0	0
GA2A				5887	15000		0	0	0	0	0	0	534	22500	0	0
GA2A	TNGT		5421	5887	15000	0	0	0	0	0	0	0	534	22500	0	0
GA2B				6139	15000		0	0	0	0	0	0	550	22500	0	0
GA2B	TNGT		5421	6139	15000	0	0	0	0	0	0	0	550	22500	0	0
GA2C				6237	15000		0	0	0	0	0	0	593	22500	0	0
GA2C	TNGT		5421	6237	15000	0	0	0	0	0	0	0	593	22500	0	0
GA2D				6181	15000		0	0	0	0	0	0	659	22500	0	0
GA2D	TNGT		5421	6181	15000	0	0	0	0	0	0	0	659	22500	0	0
GA2E				5971	15000		0	0	0	0	0	0	740	22500	0	0
GA2E	TNGT		5421	5971	15000	0	0	0	0	0	0	0	740	22500	0	0
GA4 B				5611	15000		0	0	0	0	0	0	833	22500	0	0
GA4 B	BEND		5421	5712	15000	0	0	0	0	0	0	0	1698	22500	0	0
GA4 M				5548	15000		0	0	0	0	0	0	1785	22500	0	0
GA4 M	BEND		5421	5548	15000	0	0	0	0	0	0	0	1785	22500	0	0
GA4 E				5703	15000		0	0	0	0	0	0	1788	22500	0	0
GA4 E	TNGT		5421	5606	15000	0	0	0	0	0	0	0	878	22500	0	0
GA4A				5595	15000		0	0	0	0	0	0	835	22500	0	0
GA4A	TNGT		5421	5595	15000	0	0	0	0	0	0	0	835	22500	0	0
GA4B				5589	15000		0	0	0	0	0	0	797	22500	0	0
GA4B	TNGT		5421	5589	15000	0	0	0	0	0	0	0	797	22500	0	0
GA4C				5587	15000		0	0	0	0	0	0	763	22500	0	0
GA4C	TNGT		5421	5587	15000	0	0	0	0	0	0	0	763	22500	0	0
GA4D				5590	15000		0	0	0	0	0	0	735	22500	0	0
GA4D	TNGT		5421	5590	15000	0	0	0	0	0	0	0	735	22500	0	0
GA4E				5596	15000		0	0	0	0	0	0	714	22500	0	0
GA4E	TNGT		5421	5596	15000	0	0	0	0	0	0	0	714	22500	0	0
GA4F				5607	15000		0	0	0	0	0	0	699	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
Att 2, p. 99

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
GA4F	TNGT	5421	5607	15000	0	0	0	0	0	0	0	699	22500	0	0
GA4G			5621	15000		0	0	0	0	0	0	692	22500	0	0
GA4G	TNGT	5421	5621	15000	0	0	0	0	0	0	0	692	22500	0	0
GA5 B			5637	15000		0	0	0	0	0	0	692	22500	0	0
GA5 B	BEND	5421	5854	15000	0	0	0	0	0	0	0	1849	22500	0	0
GA5 M			5673	15000		0	0	0	0	0	0	1885	22500	0	0
GA5 M	BEND	5421	5673	15000	0	0	0	0	0	0	0	1885	22500	0	0
GA5 E			7091	15000		0	0	0	0	0	0	1971	22500	0	0
GA5 E	TNGT	5421	6255	15000	0	0	0	0	0	0	0	738	22500	0	0
GA6			6557	15000		0	0	0	0	0	0	751	22500	0	0
B05	TNGT	6803	7528	15000	0	0	0	0	0	0	0	5939	22500	0	0
B06			7240	15000		0	0	0	0	0	0	3116	22500	0	0
B06	TNGT	6803	7240	15000	0	0	0	0	0	0	0	3116	22500	0	0
B07			6887	15000		0	0	0	0	0	0	7184	22500	0	0
B07	TNGT	6803	6887	15000	0	0	0	0	0	0	0	7184	22500	0	0
B07A			6818	15000		0	0	0	0	0	0	1015	22500	0	0
B07A	TNGT	6803	6818	15000	0	0	0	0	0	0	0	1015	22500	0	0
B07B			6817	15000		0	0	0	0	0	0	1069	22500	0	0
B07B	TNGT	6803	6817	15000	0	0	0	0	0	0	0	1069	22500	0	0
B10 B			6817	15000		0	0	0	0	0	0	1131	22500	0	0
B10 B	BEND	6803	6827	15000	0	0	0	0	0	0	0	2664	22500	0	0
B10 M			6903	15000		0	0	0	0	0	0	2682	22500	0	0
B10 M	BEND	6803	6903	15000	0	0	0	0	0	0	0	2682	22500	0	0
B10 E			7223	15000		0	0	0	0	0	0	2553	22500	0	0
B10 E	TNGT	6803	7041	15000	0	0	0	0	0	0	0	1084	22500	0	0
B15			7228	15000		0	0	0	0	0	0	1024	22500	0	0
B15	TNGT	6803	7228	15000	0	0	0	0	0	0	0	1024	22500	0	0
B15A			7010	15000		0	0	0	0	0	0	807	22500	0	0
B15A	TNGT	6803	7010	15000	0	0	0	0	0	0	0	807	22500	0	0
B15B			7197	15000		0	0	0	0	0	0	642	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
Att 2, p. 100

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
B15B	TNGT	6803	7197	15000	0	0	0	0	0	0	0	642	22500	0	0
B15C			6940	15000		0	0	0	0	0	0	577	22500	0	0
B15C	TNGT	6803	6940	15000	0	0	0	0	0	0	0	577	22500	0	0
B20			7368	15000		0	0	0	0	0	0	643	22500	0	0
B20	TNGT	6803	7368	15000	0	0	0	0	0	0	0	643	22500	0	0
B25			6931	15000		0	0	0	0	0	0	768	22500	0	0
B25	TNGT	6803	6931	15000	0	0	0	0	0	0	0	768	22500	0	0
B30 B			6858	15000		0	0	0	0	0	0	811	22500	0	0
B30 B	BEND	6803	6899	15000	0	0	0	0	0	0	0	1910	22500	0	0
B30 M			6845	15000		0	0	0	0	0	0	2011	22500	0	0
B30 M	BEND	6803	6845	15000	0	0	0	0	0	0	0	2011	22500	0	0
B30 E			6878	15000		0	0	0	0	0	0	1982	22500	0	0
B30 E	TNGT	6803	6846	15000	0	0	0	0	0	0	0	842	22500	0	0
B30A			6821	15000		0	0	0	0	0	0	800	22500	0	0
B30A	TNGT	6803	6821	15000	0	0	0	0	0	0	0	800	22500	0	0
B35			6898	15000		0	0	0	0	0	0	768	22500	0	0
B35	TNGT	6803	6898	15000	0	0	0	0	0	0	0	768	22500	0	0
B35A			6965	15000		0	0	0	0	0	0	655	22500	0	0
B35A	TNGT	6803	6965	15000	0	0	0	0	0	0	0	655	22500	0	0
B40			7382	15000		0	0	0	0	0	0	552	22500	0	0
B40	TNGT	6803	7382	15000	0	0	0	0	0	0	0	552	22500	0	0
B40A			6839	15000		0	0	0	0	0	0	466	22500	0	0
B40A	TNGT	6803	6839	15000	0	0	0	0	0	0	0	466	22500	0	0
B40B			7184	15000		0	0	0	0	0	0	384	22500	0	0
B40B	TNGT	6803	7184	15000	0	0	0	0	0	0	0	384	22500	0	0
B40C			7273	15000		0	0	0	0	0	0	308	22500	0	0
B40C	TNGT	6803	7273	15000	0	0	0	0	0	0	0	308	22500	0	0
B40D			7101	15000		0	0	0	0	0	0	243	22500	0	0
B40D	TNGT	6803	7101	15000	0	0	0	0	0	0	0	243	22500	0	0
B40E			6940	15000		0	0	0	0	0	0	202	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 101

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
B40E	TNGT	6803	6940	15000	0	0	0	0	0	0	0	202	22500	0	0
B45			7632	15000		0	0	0	0	0	0	198	22500	0	0
B45	TNGT	6803	7632	15000	0	0	0	0	0	0	0	198	22500	0	0
B45A			6946	15000		0	0	0	0	0	0	236	22500	0	0
B45A	TNGT	6803	6946	15000	0	0	0	0	0	0	0	236	22500	0	0
B45B			7060	15000		0	0	0	0	0	0	303	22500	0	0
B45B	TNGT	6803	7060	15000	0	0	0	0	0	0	0	303	22500	0	0
B45C			7166	15000		0	0	0	0	0	0	383	22500	0	0
B45C	TNGT	6803	7166	15000	0	0	0	0	0	0	0	383	22500	0	0
B45D			6983	15000		0	0	0	0	0	0	469	22500	0	0
B45D	TNGT	6803	6983	15000	0	0	0	0	0	0	0	469	22500	0	0
B45E			7100	15000		0	0	0	0	0	0	560	22500	0	0
B45E	TNGT	6803	7100	15000	0	0	0	0	0	0	0	560	22500	0	0
B50			7864	15000		0	0	0	0	0	0	652	22500	0	0
B50	TNGT	6803	7864	15000	0	0	0	0	0	0	0	652	22500	0	0
B50A			6986	15000		0	0	0	0	0	0	745	22500	0	0
B50A	TNGT	6803	6986	15000	0	0	0	0	0	0	0	745	22500	0	0
B50B			7211	15000		0	0	0	0	0	0	839	22500	0	0
B50B	TNGT	6803	7211	15000	0	0	0	0	0	0	0	839	22500	0	0
B50C			7509	15000		0	0	0	0	0	0	935	22500	0	0
B50C	TNGT	6803	7509	15000	0	0	0	0	0	0	0	935	22500	0	0
B50D			7517	15000		0	0	0	0	0	0	1031	22500	0	0
B50D	TNGT	6803	7517	15000	0	0	0	0	0	0	0	1031	22500	0	0
B50E			7235	15000		0	0	0	0	0	0	1128	22500	0	0
B50E	TNGT	6803	7235	15000	0	0	0	0	0	0	0	1128	22500	0	0
B55			6947	15000		0	0	0	0	0	0	1225	22500	0	0
B55	TNGT	6803	6947	15000	0	0	0	0	0	0	0	1225	22500	0	0
B60			6927	15000		0	0	0	0	0	0	1419	22500	0	0
B60	TNGT	6803	6927	15000	0	0	0	0	0	0	0	1419	22500	0	0
B65 B			6864	15000		0	0	0	0	0	0	1448	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc 1-1 R.1 A11.2, p. 102

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
B65 B	BEND	6803	6911	15000	0	0	0	0	0	0	0	3411	22500	0	0
B65 M			6923	15000		0	0	0	0	0	0	3443	22500	0	0
B65 M	BEND	6803	6923	15000	0	0	0	0	0	0	0	3443	22500	0	0
B65 E			7203	15000		0	0	0	0	0	0	3356	22500	0	0
B65 E	TNGT	6803	7030	15000	0	0	0	0	0	0	0	1425	22500	0	0
B70			7420	15000		0	0	0	0	0	0	1326	22500	0	0
B70	TNGT	6803	7420	15000	0	0	0	0	0	0	0	1326	22500	0	0
B70A			6957	15000		0	0	0	0	0	0	1188	22500	0	0
B70A	TNGT	6803	6957	15000	0	0	0	0	0	0	0	1188	22500	0	0
B70B			6986	15000		0	0	0	0	0	0	1050	22500	0	0
B70B	TNGT	6803	6986	15000	0	0	0	0	0	0	0	1050	22500	0	0
B70C			6958	15000		0	0	0	0	0	0	912	22500	0	0
B70C	TNGT	6803	6958	15000	0	0	0	0	0	0	0	912	22500	0	0
B70D			7049	15000		0	0	0	0	0	0	774	22500	0	0
B70D	TNGT	6803	7049	15000	0	0	0	0	0	0	0	774	22500	0	0
B75			7615	15000		0	0	0	0	0	0	637	22500	0	0
B75	TNGT	6803	7615	15000	0	0	0	0	0	0	0	637	22500	0	0
B75A			6923	15000		0	0	0	0	0	0	465	22500	0	0
B75A	TNGT	6803	6923	15000	0	0	0	0	0	0	0	465	22500	0	0
B75B			7200	15000		0	0	0	0	0	0	295	22500	0	0
B75B	TNGT	6803	7200	15000	0	0	0	0	0	0	0	295	22500	0	0
B75C			7152	15000		0	0	0	0	0	0	129	22500	0	0
B75C	TNGT	6803	7152	15000	0	0	0	0	0	0	0	129	22500	0	0
B80			6995	15000		0	0	0	0	0	0	76	22500	0	0
B80	TNGT	6803	6995	15000	0	0	0	0	0	0	0	76	22500	0	0
B85 B			6950	15000		0	0	0	0	0	0	97	22500	0	0
B85 B	BEND	6803	7063	15000	0	0	0	0	0	0	0	228	22500	0	0
B85 M			7082	15000		0	0	0	0	0	0	368	22500	0	0
B85 M	BEND	6803	7082	15000	0	0	0	0	0	0	0	368	22500	0	0
B85 E			7181	15000		0	0	0	0	0	0	495	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc 1-1 R.1
App. 2, p. 103

CODE B31S73

ELEMENT FROM	TO	TYPE	TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
B85 E	B90	TNGT		6803	7017	15000	0	0	0	0	0	0	0	210	22500	0	0
					7122	15000		0	0	0	0	0	0	439	22500	0	0
B90	B90A	TNGT		6803	7321	15000	0	0	0	0	0	0	0	385	22500	0	0
					6848	15000		0	0	0	0	0	0	289	22500	0	0
B90A	B95	TNGT		6803	6848	15000	0	0	0	0	0	0	0	289	22500	0	0
					7382	15000		0	0	0	0	0	0	376	22500	0	0
B95	B95A	TNGT		6803	7382	15000	0	0	0	0	0	0	0	376	22500	0	0
					7363	15000		0	0	0	0	0	0	442	22500	0	0
B95A	BSV	TNGT		6803	7363	15000	0	0	0	0	0	0	0	442	22500	0	0
					7474	15000		0	0	0	0	0	0	508	22500	0	0
BSV	B97	TNGT		5866	5960	15000	0	0	0	0	0	0	0	72	22500	0	0
					5992	15000		0	0	0	0	0	0	80	22500	0	0
B97	GB1	TNGT		4198	4521	15000	0	0	0	0	0	0	0	160	22500	0	0
					4806	15000		0	0	0	0	0	0	162	22500	0	0
GB1	CV2	TNGT		4198	4942	15000	0	0	0	0	0	0	0	0	22500	0	0
					4198	15000		0	0	0	0	0	0	0	22500	0	0
GB1	GB1A	TNGT		5421	5774	15000	0	0	0	0	0	0	0	419	22500	0	0
					5761	15000		0	0	0	0	0	0	427	22500	0	0
GB1A	GB1B	TNGT		5421	5761	15000	0	0	0	0	0	0	0	427	22500	0	0
					5748	15000		0	0	0	0	0	0	480	22500	0	0
GB1B	GB2 B	TNGT		5421	5748	15000	0	0	0	0	0	0	0	480	22500	0	0
					5735	15000		0	0	0	0	0	0	564	22500	0	0
GB2 B	GB2 M	BEND		5421	5901	15000	0	0	0	0	0	0	0	1150	22500	0	0
					5697	15000		0	0	0	0	0	0	1234	22500	0	0
GB2 M	GB2 E	BEND		5421	5697	15000	0	0	0	0	0	0	0	1234	22500	0	0
					5561	15000		0	0	0	0	0	0	1262	22500	0	0
GB2 E	GB2A	TNGT		5421	5513	15000	0	0	0	0	0	0	0	619	22500	0	0
					5916	15000		0	0	0	0	0	0	629	22500	0	0
GB2A	GB2B	TNGT		5421	5916	15000	0	0	0	0	0	0	0	629	22500	0	0
					6165	15000		0	0	0	0	0	0	663	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R. 1
Att. 2, p. 104

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
GB2B	TNGT	5421	6165	15000	0	0	0	0	0	0	0	663	22500	0	0
GB2C			6261	15000		0	0	0	0	0	0	719	22500	0	0
GB2C	TNGT	5421	6261	15000	0	0	0	0	0	0	0	719	22500	0	0
GB2D			6201	15000		0	0	0	0	0	0	792	22500	0	0
GB2D	TNGT	5421	6201	15000	0	0	0	0	0	0	0	792	22500	0	0
GB2E			5987	15000		0	0	0	0	0	0	877	22500	0	0
GB2E	TNGT	5421	5987	15000	0	0	0	0	0	0	0	877	22500	0	0
GB4 B			5618	15000		0	0	0	0	0	0	972	22500	0	0
GB4 B	BEND	5421	5723	15000	0	0	0	0	0	0	0	1981	22500	0	0
GB4 M			5510	15000		0	0	0	0	0	0	2089	22500	0	0
GB4 M	BEND	5421	5510	15000	0	0	0	0	0	0	0	2089	22500	0	0
GB4 E			5700	15000		0	0	0	0	0	0	2147	22500	0	0
GB4 E	TNGT	5421	5603	15000	0	0	0	0	0	0	0	1054	22500	0	0
GB4A			5614	15000		0	0	0	0	0	0	1075	22500	0	0
GB4A	TNGT	5421	5614	15000	0	0	0	0	0	0	0	1075	22500	0	0
GB4B			5624	15000		0	0	0	0	0	0	1108	22500	0	0
GB4B	TNGT	5421	5624	15000	0	0	0	0	0	0	0	1108	22500	0	0
GB4C			5635	15000		0	0	0	0	0	0	1152	22500	0	0
GB4C	TNGT	5421	5635	15000	0	0	0	0	0	0	0	1152	22500	0	0
GB4D			5645	15000		0	0	0	0	0	0	1205	22500	0	0
GB4D	TNGT	5421	5645	15000	0	0	0	0	0	0	0	1205	22500	0	0
GB4E			5656	15000		0	0	0	0	0	0	1266	22500	0	0
GB4E	TNGT	5421	5656	15000	0	0	0	0	0	0	0	1266	22500	0	0
GB4F			5666	15000		0	0	0	0	0	0	1334	22500	0	0
GB4F	TNGT	5421	5666	15000	0	0	0	0	0	0	0	1334	22500	0	0
GB4G			5677	15000		0	0	0	0	0	0	1408	22500	0	0
GB4G	TNGT	5421	5677	15000	0	0	0	0	0	0	0	1408	22500	0	0
GB5			5687	15000		0	0	0	0	0	0	1488	22500	0	0
C05	TNGT	6803	7550	15000	0	0	0	0	0	0	0	5945	22500	0	0
C06			7246	15000		0	0	0	0	0	0	3184	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App 2, p. 105

CODE B31S73

ELEMENT FROM	ELEMENT TO	ELEMENT TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
C06		TNGT	6803	7246	15000	0	0	0	0	0	0	0	3184	22500	0	0
C07				7146	15000		0	0	0	0	0	0	7337	22500	0	0
C07		TNGT	6803	7146	15000	0	0	0	0	0	0	0	7337	22500	0	0
C07A				6864	15000		0	0	0	0	0	0	1022	22500	0	0
C07A		TNGT	6803	6864	15000	0	0	0	0	0	0	0	1022	22500	0	0
C07B				6863	15000		0	0	0	0	0	0	1071	22500	0	0
C07B		TNGT	6803	6863	15000	0	0	0	0	0	0	0	1071	22500	0	0
C10	B			6863	15000		0	0	0	0	0	0	1136	22500	0	0
C10	B	BEND	6803	6908	15000	0	0	0	0	0	0	0	2676	22500	0	0
C10	M			6836	15000		0	0	0	0	0	0	2699	22500	0	0
C10	M	BEND	6803	6836	15000	0	0	0	0	0	0	0	2699	22500	0	0
C10	E			7180	15000		0	0	0	0	0	0	2564	22500	0	0
C10	E	TNGT	6803	7017	15000	0	0	0	0	0	0	0	1089	22500	0	0
C15				7220	15000		0	0	0	0	0	0	1025	22500	0	0
C15		TNGT	6803	7220	15000	0	0	0	0	0	0	0	1025	22500	0	0
C15A				6868	15000		0	0	0	0	0	0	841	22500	0	0
C15A		TNGT	6803	6868	15000	0	0	0	0	0	0	0	841	22500	0	0
C15B				7072	15000		0	0	0	0	0	0	690	22500	0	0
C15B		TNGT	6803	7072	15000	0	0	0	0	0	0	0	690	22500	0	0
C15C				7001	15000		0	0	0	0	0	0	597	22500	0	0
C15C		TNGT	6803	7001	15000	0	0	0	0	0	0	0	597	22500	0	0
C15D				6952	15000		0	0	0	0	0	0	591	22500	0	0
C15D		TNGT	6803	6952	15000	0	0	0	0	0	0	0	591	22500	0	0
C20				7573	15000		0	0	0	0	0	0	674	22500	0	0
C20		TNGT	6803	7573	15000	0	0	0	0	0	0	0	674	22500	0	0
C25				6838	15000		0	0	0	0	0	0	979	22500	0	0
C25		TNGT	6803	6838	15000	0	0	0	0	0	0	0	979	22500	0	0
C30	B			6826	15000		0	0	0	0	0	0	1000	22500	0	0
C30	B	BEND	6803	6843	15000	0	0	0	0	0	0	0	2355	22500	0	0
C30	M			6819	15000		0	0	0	0	0	0	2483	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1 App. 2, p. 106

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
C30 M	BEND	6803	6819	15000	0	0	0	0	0	0	0	2483	22500	0	0
C30 E			6851	15000		0	0	0	0	0	0	2451	22500	0	0
C30 E	TNGT	6803	6830	15000	0	0	0	0	0	0	0	1041	22500	0	0
C35			7042	15000		0	0	0	0	0	0	949	22500	0	0
C35	TNGT	6803	7042	15000	0	0	0	0	0	0	0	949	22500	0	0
C35A			6914	15000		0	0	0	0	0	0	837	22500	0	0
C35A	TNGT	6803	6914	15000	0	0	0	0	0	0	0	837	22500	0	0
C35B			6954	15000		0	0	0	0	0	0	725	22500	0	0
C35B	TNGT	6803	6954	15000	0	0	0	0	0	0	0	725	22500	0	0
C35C			6920	15000		0	0	0	0	0	0	615	22500	0	0
C35C	TNGT	6803	6920	15000	0	0	0	0	0	0	0	615	22500	0	0
C40			7494	15000		0	0	0	0	0	0	507	22500	0	0
C40	TNGT	6803	7494	15000	0	0	0	0	0	0	0	507	22500	0	0
C40A			6820	15000		0	0	0	0	0	0	405	22500	0	0
C40A	TNGT	6803	6820	15000	0	0	0	0	0	0	0	405	22500	0	0
C40B			7184	15000		0	0	0	0	0	0	309	22500	0	0
C40B	TNGT	6803	7184	15000	0	0	0	0	0	0	0	309	22500	0	0
C40C			7285	15000		0	0	0	0	0	0	227	22500	0	0
C40C	TNGT	6803	7285	15000	0	0	0	0	0	0	0	227	22500	0	0
C40D			7097	15000		0	0	0	0	0	0	177	22500	0	0
C40D	TNGT	6803	7097	15000	0	0	0	0	0	0	0	177	22500	0	0
C40E			6987	15000		0	0	0	0	0	0	189	22500	0	0
C40E	TNGT	6803	6987	15000	0	0	0	0	0	0	0	189	22500	0	0
C45			7754	15000		0	0	0	0	0	0	254	22500	0	0
C45	TNGT	6803	7754	15000	0	0	0	0	0	0	0	254	22500	0	0
C45A			6990	15000		0	0	0	0	0	0	341	22500	0	0
C45A	TNGT	6803	6990	15000	0	0	0	0	0	0	0	341	22500	0	0
C45B			7092	15000		0	0	0	0	0	0	440	22500	0	0
C45B	TNGT	6803	7092	15000	0	0	0	0	0	0	0	440	22500	0	0
C45C			7275	15000		0	0	0	0	0	0	546	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc 1-1 R.1
App. 2, p. 107

CODE B31S73

ELEMENT FROM	ELEMENT TO	ELEMENT TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
C45C		TNGT	6803	7275	15000	0	0	0	0	0	0	0	546	22500	0	0
	C45D			7168	15000		0	0	0	0	0	0	654	22500	0	0
C45D		TNGT	6803	7168	15000	0	0	0	0	0	0	0	654	22500	0	0
	C45E			6840	15000		0	0	0	0	0	0	764	22500	0	0
C45E		TNGT	6803	6840	15000	0	0	0	0	0	0	0	764	22500	0	0
	C50			7524	15000		0	0	0	0	0	0	875	22500	0	0
C50		TNGT	6803	7524	15000	0	0	0	0	0	0	0	875	22500	0	0
	C50A			6822	15000		0	0	0	0	0	0	968	22500	0	0
C50A		TNGT	6803	6822	15000	0	0	0	0	0	0	0	968	22500	0	0
	C50B			7277	15000		0	0	0	0	0	0	1063	22500	0	0
C50B		TNGT	6803	7277	15000	0	0	0	0	0	0	0	1063	22500	0	0
	C50C			7525	15000		0	0	0	0	0	0	1158	22500	0	0
C50C		TNGT	6803	7525	15000	0	0	0	0	0	0	0	1158	22500	0	0
	C50D			7542	15000		0	0	0	0	0	0	1254	22500	0	0
C50D		TNGT	6803	7542	15000	0	0	0	0	0	0	0	1254	22500	0	0
	C50E			7327	15000		0	0	0	0	0	0	1351	22500	0	0
C50E		TNGT	6803	7327	15000	0	0	0	0	0	0	0	1351	22500	0	0
	C55			6881	15000		0	0	0	0	0	0	1448	22500	0	0
C55		TNGT	6803	6881	15000	0	0	0	0	0	0	0	1448	22500	0	0
	C60			7192	15000		0	0	0	0	0	0	1518	22500	0	0
C60		TNGT	6803	7192	15000	0	0	0	0	0	0	0	1518	22500	0	0
	C65 B			6974	15000		0	0	0	0	0	0	1596	22500	0	0
C65 B		BEND	6803	7105	15000	0	0	0	0	0	0	0	3759	22500	0	0
	C65 M			7009	15000		0	0	0	0	0	0	3786	22500	0	0
C65 M		BEND	6803	7009	15000	0	0	0	0	0	0	0	3786	22500	0	0
	C65 E			6998	15000		0	0	0	0	0	0	3665	22500	0	0
C65 E		TNGT	6803	6913	15000	0	0	0	0	0	0	0	1556	22500	0	0
	C65A			6924	15000		0	0	0	0	0	0	1445	22500	0	0
C65A		TNGT	6803	6924	15000	0	0	0	0	0	0	0	1445	22500	0	0
	C70			7051	15000		0	0	0	0	0	0	1334	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 108

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
C70	TNGT	6803	7051	15000	0	0	0	0	0	0	0	1334	22500	0	0
C70A			6977	15000		0	0	0	0	0	0	1158	22500	0	0
C70A	TNGT	6803	6977	15000	0	0	0	0	0	0	0	1158	22500	0	0
C70B			7065	15000		0	0	0	0	0	0	982	22500	0	0
C70B	TNGT	6803	7065	15000	0	0	0	0	0	0	0	982	22500	0	0
C70C			6942	15000		0	0	0	0	0	0	806	22500	0	0
C70C	TNGT	6803	6942	15000	0	0	0	0	0	0	0	806	22500	0	0
C75			7141	15000		0	0	0	0	0	0	631	22500	0	0
C75	TNGT	6803	7141	15000	0	0	0	0	0	0	0	631	22500	0	0
C75A			6983	15000		0	0	0	0	0	0	451	22500	0	0
C75A	TNGT	6803	6983	15000	0	0	0	0	0	0	0	451	22500	0	0
C75B			7163	15000		0	0	0	0	0	0	272	22500	0	0
C75B	TNGT	6803	7163	15000	0	0	0	0	0	0	0	272	22500	0	0
C75C			7100	15000		0	0	0	0	0	0	93	22500	0	0
C75C	TNGT	6803	7100	15000	0	0	0	0	0	0	0	93	22500	0	0
C80			6925	15000		0	0	0	0	0	0	87	22500	0	0
C80	TNGT	6803	6925	15000	0	0	0	0	0	0	0	87	22500	0	0
C85 B			6912	15000		0	0	0	0	0	0	124	22500	0	0
C85 B	BEND	6803	6996	15000	0	0	0	0	0	0	0	291	22500	0	0
C85 M			7034	15000		0	0	0	0	0	0	491	22500	0	0
C85 M	BEND	6803	7034	15000	0	0	0	0	0	0	0	491	22500	0	0
C85 E			7042	15000		0	0	0	0	0	0	652	22500	0	0
C85 E	TNGT	6803	6939	15000	0	0	0	0	0	0	0	277	22500	0	0
C90			6965	15000		0	0	0	0	0	0	571	22500	0	0
C90	TNGT	6803	7087	15000	0	0	0	0	0	0	0	525	22500	0	0
C95			7032	15000		0	0	0	0	0	0	407	22500	0	0
C95	TNGT	6803	7032	15000	0	0	0	0	0	0	0	407	22500	0	0
C96			6952	15000		0	0	0	0	0	0	535	22500	0	0
C96	TNGT	6803	6952	15000	0	0	0	0	0	0	0	535	22500	0	0
CSV			6974	15000		0	0	0	0	0	0	556	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App 2, p. 109

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
CSV	TNGT	5866	5890	15000	0	0	0	0	0	0	0	78	22500	0	0
C97			5911	15000		0	0	0	0	0	0	88	22500	0	0
C97	TNGT	4198	4481	15000	0	0	0	0	0	0	0	267	22500	0	0
GC1			4818	15000		0	0	0	0	0	0	194	22500	0	0
GC1	TNGT	4198	4952	15000	0	0	0	0	0	0	0	0	22500	0	0
CV3			4198	15000		0	0	0	0	0	0	0	22500	0	0
GC1	TNGT	5421	5769	15000	0	0	0	0	0	0	0	501	22500	0	0
GC1A			5759	15000		0	0	0	0	0	0	379	22500	0	0
GC1A	TNGT	5421	5759	15000	0	0	0	0	0	0	0	379	22500	0	0
GC1B			5748	15000		0	0	0	0	0	0	414	22500	0	0
GC1B	TNGT	5421	5748	15000	0	0	0	0	0	0	0	414	22500	0	0
GC2 B			5737	15000		0	0	0	0	0	0	579	22500	0	0
GC2 B	BEND	5421	5904	15000	0	0	0	0	0	0	0	1181	22500	0	0
GC2 M			5702	15000		0	0	0	0	0	0	1366	22500	0	0
GC2 M	BEND	5421	5702	15000	0	0	0	0	0	0	0	1366	22500	0	0
GC2 E			5554	15000		0	0	0	0	0	0	1437	22500	0	0
GC2 E	TNGT	5421	5508	15000	0	0	0	0	0	0	0	705	22500	0	0
GC2A			5912	15000		0	0	0	0	0	0	709	22500	0	0
GC2A	TNGT	5421	5912	15000	0	0	0	0	0	0	0	709	22500	0	0
GC2B			6162	15000		0	0	0	0	0	0	732	22500	0	0
GC2B	TNGT	5421	6162	15000	0	0	0	0	0	0	0	732	22500	0	0
GC2C			6257	15000		0	0	0	0	0	0	771	22500	0	0
GC2C	TNGT	5421	6257	15000	0	0	0	0	0	0	0	771	22500	0	0
GC2D			6197	15000		0	0	0	0	0	0	824	22500	0	0
GC2D	TNGT	5421	6197	15000	0	0	0	0	0	0	0	824	22500	0	0
GC2E			5983	15000		0	0	0	0	0	0	889	22500	0	0
GC2E	TNGT	5421	5983	15000	0	0	0	0	0	0	0	889	22500	0	0
GC4 B			5614	15000		0	0	0	0	0	0	963	22500	0	0
GC4 B	BEND	5421	5717	15000	0	0	0	0	0	0	0	1963	22500	0	0
GC4 M			5517	15000		0	0	0	0	0	0	2038	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 110

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
GC4 M	BEND	5421	5517	15000	0	0	0	0	0	0	0	2038	22500	0	0
GC4 E			5704	15000		0	0	0	0	0	0	2080	22500	0	0
GC4 E	TNGT	5421	5606	15000	0	0	0	0	0	0	0	1021	22500	0	0
GC4A			5615	15000		0	0	0	0	0	0	1057	22500	0	0
GC4A	TNGT	5421	5615	15000	0	0	0	0	0	0	0	1057	22500	0	0
GC4B			5624	15000		0	0	0	0	0	0	1132	22500	0	0
GC4B	TNGT	5421	5624	15000	0	0	0	0	0	0	0	1132	22500	0	0
GC4C			5632	15000		0	0	0	0	0	0	1237	22500	0	0
GC4C	TNGT	5421	5632	15000	0	0	0	0	0	0	0	1237	22500	0	0
GC4D			5641	15000		0	0	0	0	0	0	1367	22500	0	0
GC4D	TNGT	5421	5641	15000	0	0	0	0	0	0	0	1367	22500	0	0
GC4E			5650	15000		0	0	0	0	0	0	1514	22500	0	0
GC4E	TNGT	5421	5650	15000	0	0	0	0	0	0	0	1514	22500	0	0
GC4F			5659	15000		0	0	0	0	0	0	1675	22500	0	0
GC4F	TNGT	5421	5659	15000	0	0	0	0	0	0	0	1675	22500	0	0
GC4G			5667	15000		0	0	0	0	0	0	1845	22500	0	0
GC4G	TNGT	5421	5667	15000	0	0	0	0	0	0	0	1845	22500	0	0
GC5			5676	15000		0	0	0	0	0	0	2022	22500	0	0
D05	TNGT	6803	7570	15000	0	0	0	0	0	0	0	5992	22500	0	0
D06			7259	15000		0	0	0	0	0	0	3301	22500	0	0
D06	TNGT	6803	7259	15000	0	0	0	0	0	0	0	3301	22500	0	0
D07			7515	15000		0	0	0	0	0	0	8334	22500	0	0
D07	TNGT	6803	7515	15000	0	0	0	0	0	0	0	8334	22500	0	0
D07A			6933	15000		0	0	0	0	0	0	1138	22500	0	0
D07A	TNGT	6803	6933	15000	0	0	0	0	0	0	0	1138	22500	0	0
D07B			6935	15000		0	0	0	0	0	0	1175	22500	0	0
D07B	TNGT	6803	6935	15000	0	0	0	0	0	0	0	1175	22500	0	0
D10 B			6937	15000		0	0	0	0	0	0	1237	22500	0	0
D10 B	BEND	6803	7039	15000	0	0	0	0	0	0	0	2913	22500	0	0
D10 M			6985	15000		0	0	0	0	0	0	2927	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

calc. 1-1 R-1
AIP-2, P-111

CODE B31S73

ELEMENT FROM	ELEMENT TO	TYPE	TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
D10 M		BEND		6803	6985	15000	0	0	0	0	0	0	0	2927	22500	0	0
D10 E					7156	15000		0	0	0	0	0	0	2765	22500	0	0
D10 E		TNGT		6803	7003	15000	0	0	0	0	0	0	0	1174	22500	0	0
D15					7188	15000		0	0	0	0	0	0	1100	22500	0	0
D15		TNGT		6803	7188	15000	0	0	0	0	0	0	0	1100	22500	0	0
D15A					7028	15000		0	0	0	0	0	0	830	22500	0	0
D15A		TNGT		6803	7028	15000	0	0	0	0	0	0	0	830	22500	0	0
D15B					7162	15000		0	0	0	0	0	0	626	22500	0	0
D15B		TNGT		6803	7162	15000	0	0	0	0	0	0	0	626	22500	0	0
D15C					6916	15000		0	0	0	0	0	0	563	22500	0	0
D15C		TNGT		6803	6916	15000	0	0	0	0	0	0	0	563	22500	0	0
D20					7468	15000		0	0	0	0	0	0	682	22500	0	0
D20		TNGT		6803	7468	15000	0	0	0	0	0	0	0	682	22500	0	0
D20A					7123	15000		0	0	0	0	0	0	913	22500	0	0
D20A		TNGT		6803	7123	15000	0	0	0	0	0	0	0	913	22500	0	0
D25					7199	15000		0	0	0	0	0	0	1197	22500	0	0
D25		TNGT		6803	7199	15000	0	0	0	0	0	0	0	1197	22500	0	0
D30 B					7131	15000		0	0	0	0	0	0	1223	22500	0	0
D30 B		BEND		6803	7382	15000	0	0	0	0	0	0	0	2881	22500	0	0
D30 M					6974	15000		0	0	0	0	0	0	3042	22500	0	0
D30 M		BEND		6803	6974	15000	0	0	0	0	0	0	0	3042	22500	0	0
D30 E					7098	15000		0	0	0	0	0	0	3014	22500	0	0
D30 E		TNGT		6803	6970	15000	0	0	0	0	0	0	0	1280	22500	0	0
D30A					7184	15000		0	0	0	0	0	0	1194	22500	0	0
D30A		TNGT		6803	7184	15000	0	0	0	0	0	0	0	1194	22500	0	0
D33					7271	15000		0	0	0	0	0	0	1115	22500	0	0
D33		TNGT		6803	7271	15000	0	0	0	0	0	0	0	1115	22500	0	0
D35					7208	15000		0	0	0	0	0	0	1032	22500	0	0
D35		TNGT		6803	7208	15000	0	0	0	0	0	0	0	1032	22500	0	0
D35A					7332	15000		0	0	0	0	0	0	906	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 112

CODE B31S73

ELEMENT FROM	ELEMENT TYPE	SUSTAINED LOAD			OCCASIONAL LOAD						THERMAL EXPANSION		NON-REPEATED ANCHOR MOV	
			EQN 11		LEVEL B EQN 12		LEVEL C EQN 12		LEVEL D EQN 12		EQNS 13/14		EQN ***	
TO	TITLE	PD/4T PSI	CALC PSI	ALLOW PSI	PD/4T PSI	CALC PSI	ALLOW PSI	CALC PSI	ALLOW PSI	CALC PSI	ALLOW PSI	CALC PSI	ALLOW PSI	CALC PSI	ALLOW PSI
D35A	TNGT	6803	7332	15000	0	0	0	0	0	0	0	906	22500	0	0
D35B			7169	15000		0	0	0	0	0	0	781	22500	0	0
D35B	TNGT	6803	7169	15000	0	0	0	0	0	0	0	781	22500	0	0
D35C			6893	15000		0	0	0	0	0	0	659	22500	0	0
D35C	TNGT	6803	6893	15000	0	0	0	0	0	0	0	659	22500	0	0
D40			7631	15000		0	0	0	0	0	0	542	22500	0	0
D40	TNGT	6803	7631	15000	0	0	0	0	0	0	0	542	22500	0	0
D40A			6913	15000		0	0	0	0	0	0	427	22500	0	0
D40A	TNGT	6803	6913	15000	0	0	0	0	0	0	0	427	22500	0	0
D40B			7124	15000		0	0	0	0	0	0	317	22500	0	0
D40B	TNGT	6803	7124	15000	0	0	0	0	0	0	0	317	22500	0	0
D40C			7260	15000		0	0	0	0	0	0	221	22500	0	0
D40C	TNGT	6803	7260	15000	0	0	0	0	0	0	0	221	22500	0	0
D40D			7105	15000		0	0	0	0	0	0	166	22500	0	0
D40D	TNGT	6803	7105	15000	0	0	0	0	0	0	0	166	22500	0	0
D40E			6951	15000		0	0	0	0	0	0	190	22500	0	0
D40E	TNGT	6803	6951	15000	0	0	0	0	0	0	0	190	22500	0	0
D45			7688	15000		0	0	0	0	0	0	274	22500	0	0
D45	TNGT	6803	7688	15000	0	0	0	0	0	0	0	274	22500	0	0
D45A			6961	15000		0	0	0	0	0	0	378	22500	0	0
D45A	TNGT	6803	6961	15000	0	0	0	0	0	0	0	378	22500	0	0
D45B			7085	15000		0	0	0	0	0	0	492	22500	0	0
D45B	TNGT	6803	7085	15000	0	0	0	0	0	0	0	492	22500	0	0
D45C			7232	15000		0	0	0	0	0	0	612	22500	0	0
D45C	TNGT	6803	7232	15000	0	0	0	0	0	0	0	612	22500	0	0
D45D			7089	15000		0	0	0	0	0	0	733	22500	0	0
D45D	TNGT	6803	7089	15000	0	0	0	0	0	0	0	733	22500	0	0
D45E			6954	15000		0	0	0	0	0	0	856	22500	0	0
D45E	TNGT	6803	6954	15000	0	0	0	0	0	0	0	856	22500	0	0
D50			7677	15000		0	0	0	0	0	0	980	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 113

CODE B31S73

ELEMENT FROM	ELEMENT TO	ELEMENT TYPE TITLE	SUSTAINED LOAD EQN 11 PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
D50		TNGT	6803	7677	15000	0	0	0	0	0	0	0	980	22500	0	0
	D50A			6929	15000		0	0	0	0	0	0	1084	22500	0	0
D50A		TNGT	6803	6929	15000	0	0	0	0	0	0	0	1084	22500	0	0
	D50B			7200	15000		0	0	0	0	0	0	1189	22500	0	0
D50B		TNGT	6803	7200	15000	0	0	0	0	0	0	0	1189	22500	0	0
	D50C			7486	15000		0	0	0	0	0	0	1296	22500	0	0
D50C		TNGT	6803	7486	15000	0	0	0	0	0	0	0	1296	22500	0	0
	D50D			7540	15000		0	0	0	0	0	0	1403	22500	0	0
D50D		TNGT	6803	7540	15000	0	0	0	0	0	0	0	1403	22500	0	0
	D50E			7363	15000		0	0	0	0	0	0	1511	22500	0	0
D50E		TNGT	6803	7363	15000	0	0	0	0	0	0	0	1511	22500	0	0
	D55			6956	15000		0	0	0	0	0	0	1619	22500	0	0
D55		TNGT	6803	6956	15000	0	0	0	0	0	0	0	1619	22500	0	0
	D60			7090	15000		0	0	0	0	0	0	1697	22500	0	0
D60		TNGT	6803	7090	15000	0	0	0	0	0	0	0	1697	22500	0	0
	D65 B			7069	15000		0	0	0	0	0	0	1706	22500	0	0
D65 B		BEND	6803	7273	15000	0	0	0	0	0	0	0	4019	22500	0	0
	D65 M			7135	15000		0	0	0	0	0	0	4039	22500	0	0
D65 M		BEND	6803	7135	15000	0	0	0	0	0	0	0	4039	22500	0	0
	D65 E			7114	15000		0	0	0	0	0	0	3878	22500	0	0
D65 E		TNGT	6803	6979	15000	0	0	0	0	0	0	0	1646	22500	0	0
	D65A			6978	15000		0	0	0	0	0	0	1566	22500	0	0
D65A		TNGT	6803	6978	15000	0	0	0	0	0	0	0	1566	22500	0	0
	D70			6974	15000		0	0	0	0	0	0	1486	22500	0	0
D70		TNGT	6803	6974	15000	0	0	0	0	0	0	0	1486	22500	0	0
	D70A			7173	15000		0	0	0	0	0	0	1291	22500	0	0
D70A		TNGT	6803	7173	15000	0	0	0	0	0	0	0	1291	22500	0	0
	D70B			7296	15000		0	0	0	0	0	0	1095	22500	0	0
D70B		TNGT	6803	7296	15000	0	0	0	0	0	0	0	1095	22500	0	0
	D70C			7239	15000		0	0	0	0	0	0	900	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

calc. 1-1 R.1
APP-2, P.114

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
D70C	TNGT	6803	7239	15000	0	0	0	0	0	0	0	900	22500	0	0
D75			7026	15000		0	0	0	0	0	0	704	22500	0	0
D75	TNGT	6803	7026	15000	0	0	0	0	0	0	0	704	22500	0	0
D75A			7203	15000		0	0	0	0	0	0	473	22500	0	0
D75A	TNGT	6803	7203	15000	0	0	0	0	0	0	0	473	22500	0	0
D75B			7154	15000		0	0	0	0	0	0	242	22500	0	0
D75B	TNGT	6803	7154	15000	0	0	0	0	0	0	0	242	22500	0	0
D80			6975	15000		0	0	0	0	0	0	13	22500	0	0
D80	TNGT	6803	6975	15000	0	0	0	0	0	0	0	13	22500	0	0
D85 B			6980	15000		0	0	0	0	0	0	97	22500	0	0
D85 B	BEND	6803	7115	15000	0	0	0	0	0	0	0	228	22500	0	0
D85 M			7119	15000		0	0	0	0	0	0	475	22500	0	0
D85 M	BEND	6803	7119	15000	0	0	0	0	0	0	0	475	22500	0	0
D85 E			7077	15000		0	0	0	0	0	0	665	22500	0	0
D85 E	TNGT	6803	6958	15000	0	0	0	0	0	0	0	282	22500	0	0
D90			7035	15000		0	0	0	0	0	0	587	22500	0	0
D90	TNGT	6803	6980	15000	0	0	0	0	0	0	0	529	22500	0	0
D95			7168	15000		0	0	0	0	0	0	357	22500	0	0
D95	TNGT	6803	7168	15000	0	0	0	0	0	0	0	357	22500	0	0
D96			7391	15000		0	0	0	0	0	0	520	22500	0	0
D96	TNGT	6803	7391	15000	0	0	0	0	0	0	0	520	22500	0	0
DSV			7452	15000		0	0	0	0	0	0	542	22500	0	0
DSV	TNGT	5866	5957	15000	0	0	0	0	0	0	0	76	22500	0	0
D97			6002	15000		0	0	0	0	0	0	89	22500	0	0
D97	TNGT	5866	6880	15000	0	0	0	0	0	0	0	8	22500	0	0
MS4			5866	15000		0	0	0	0	0	0	0	22500	0	0
D97	TNGT	4198	4446	15000	0	0	0	0	0	0	0	163	22500	0	0
GD1			4846	15000		0	0	0	0	0	0	173	22500	0	0
GD1	TNGT	4198	4953	15000	0	0	0	0	0	0	0	0	22500	0	0
CV4			4198	15000		0	0	0	0	0	0	0	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
Att. 2, p. 115

CODE B31S73

ELEMENT FROM	ELEMENT TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
GD1		TNGT	5421	5731	15000	0	0	0	0	0	0	0	447	22500	0	0
GD1A				5742	15000		0	0	0	0	0	0	473	22500	0	0
GD1A		TNGT	5421	5742	15000	0	0	0	0	0	0	0	473	22500	0	0
GD1B				5756	15000		0	0	0	0	0	0	522	22500	0	0
GD1B		TNGT	5421	5756	15000	0	0	0	0	0	0	0	522	22500	0	0
GD2 B				5771	15000		0	0	0	0	0	0	589	22500	0	0
GD2 B		BEND	5421	5956	15000	0	0	0	0	0	0	0	1200	22500	0	0
GD2 M				5783	15000		0	0	0	0	0	0	1264	22500	0	0
GD2 M		BEND	5421	5783	15000	0	0	0	0	0	0	0	1264	22500	0	0
GD2 E				5583	15000		0	0	0	0	0	0	1282	22500	0	0
GD2 E		TNGT	5421	5527	15000	0	0	0	0	0	0	0	629	22500	0	0
GD2A				5886	15000		0	0	0	0	0	0	621	22500	0	0
GD2A		TNGT	5421	5886	15000	0	0	0	0	0	0	0	621	22500	0	0
GD2B				6134	15000		0	0	0	0	0	0	615	22500	0	0
GD2B		TNGT	5421	6134	15000	0	0	0	0	0	0	0	615	22500	0	0
GD2C				6229	15000		0	0	0	0	0	0	614	22500	0	0
GD2C		TNGT	5421	6229	15000	0	0	0	0	0	0	0	614	22500	0	0
GD2D				6171	15000		0	0	0	0	0	0	615	22500	0	0
GD2D		TNGT	5421	6171	15000	0	0	0	0	0	0	0	615	22500	0	0
GD2E				5959	15000		0	0	0	0	0	0	621	22500	0	0
GD2E		TNGT	5421	5959	15000	0	0	0	0	0	0	0	621	22500	0	0
GD4 B				5593	15000		0	0	0	0	0	0	630	22500	0	0
GD4 B		BEND	5421	5685	15000	0	0	0	0	0	0	0	1283	22500	0	0
GD4 M				5548	15000		0	0	0	0	0	0	1284	22500	0	0
GD4 M		BEND	5421	5548	15000	0	0	0	0	0	0	0	1284	22500	0	0
GD4 E				5713	15000		0	0	0	0	0	0	1271	22500	0	0
GD4 E		TNGT	5421	5612	15000	0	0	0	0	0	0	0	624	22500	0	0
GD4A				5598	15000		0	0	0	0	0	0	617	22500	0	0
GD4A		TNGT	5421	5598	15000	0	0	0	0	0	0	0	617	22500	0	0
GD4B				5588	15000		0	0	0	0	0	0	632	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R1
App 2, P. 116

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD			OCCASIONAL LOAD						THERMAL EXPANSION		NON-REPEATED ANCHOR MOV	
			EQN 11		LEVEL B EQN 12		LEVEL C EQN 12		LEVEL D EQN 12		EQNS 13/14		EQN ***	
		PD/4T PSI	CALC PSI	ALLOW PSI	PD/4T PSI	CALC PSI	ALLOW PSI	CALC PSI	ALLOW PSI	CALC PSI	ALLOW PSI	CALC PSI	ALLOW PSI	CALC PSI	ALLOW PSI
GD4B	TNGT	5421	5588	15000	0	0	0	0	0	0	0	632	22500	0	0
GD4C			5582	15000		0	0	0	0	0	0	666	22500	0	0
GD4C	TNGT	5421	5582	15000	0	0	0	0	0	0	0	666	22500	0	0
GD4D			5582	15000		0	0	0	0	0	0	717	22500	0	0
GD4D	TNGT	5421	5582	15000	0	0	0	0	0	0	0	717	22500	0	0
GD4E			5587	15000		0	0	0	0	0	0	781	22500	0	0
GD4E	TNGT	5421	5587	15000	0	0	0	0	0	0	0	781	22500	0	0
GD4F			5597	15000		0	0	0	0	0	0	856	22500	0	0
GD4F	TNGT	5421	5597	15000	0	0	0	0	0	0	0	856	22500	0	0
GD4G			5611	15000		0	0	0	0	0	0	939	22500	0	0
GD4G	TNGT	5421	5611	15000	0	0	0	0	0	0	0	939	22500	0	0
GD5 B			5628	15000		0	0	0	0	0	0	1028	22500	0	0
GD5 B	BEND	5421	5835	15000	0	0	0	0	0	0	0	2746	22500	0	0
GD5 M			5641	15000		0	0	0	0	0	0	2837	22500	0	0
GD5 M	BEND	5421	5641	15000	0	0	0	0	0	0	0	2837	22500	0	0
GD5 E			7088	15000		0	0	0	0	0	0	2915	22500	0	0
GD5 E	TNGT	5421	6253	15000	0	0	0	0	0	0	0	1092	22500	0	0
GD6			6557	15000		0	0	0	0	0	0	1099	22500	0	0
A90	TNGT	4383	4585	15000	0	0	0	0	0	0	0	321	22500	0	0
105 B			4564	15000		0	0	0	0	0	0	202	22500	0	0
105 B	BEND	4383	4625	15000	0	0	0	0	0	0	0	360	22500	0	0
105 M			4584	15000		0	0	0	0	0	0	319	22500	0	0
105 M	BEND	4383	4584	15000	0	0	0	0	0	0	0	319	22500	0	0
105 E			4551	15000		0	0	0	0	0	0	296	22500	0	0
105 E	TNGT	4383	4509	15000	0	0	0	0	0	0	0	166	22500	0	0
105A			4888	15000		0	0	0	0	0	0	157	22500	0	0
105A	TNGT	4383	4888	15000	0	0	0	0	0	0	0	157	22500	0	0
110			5507	15000		0	0	0	0	0	0	154	22500	0	0
110	TNGT	4383	5507	15000	0	0	0	0	0	0	0	154	22500	0	0
110A			4857	15000		0	0	0	0	0	0	166	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 117

CODE B31S73

ELEMENT FROM	ELEMENT TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	LEVEL B EQN 12 CALC PSI	LEVEL B EQN 12 ALLOW PSI	LEVEL C EQN 12 CALC PSI	LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
110A		TNGT	4383	4857	15000	0	0	0	0	0	0	0	166	22500	0	0
115				4585	15000		0	0	0	0	0	0	224	22500	0	0
115		TNGT	4534	5110	15000	0	0	0	0	0	0	0	112	22500	0	0
115A				4872	15000		0	0	0	0	0	0	56	22500	0	0
115A		TNGT	4534	4872	15000	0	0	0	0	0	0	0	56	22500	0	0
115B				4721	15000		0	0	0	0	0	0	36	22500	0	0
115B		TNGT	4534	4721	15000	0	0	0	0	0	0	0	36	22500	0	0
120				5536	15000		0	0	0	0	0	0	22	22500	0	0
120		TNGT	4534	5536	15000	0	0	0	0	0	0	0	22	22500	0	0
120A				4920	15000		0	0	0	0	0	0	24	22500	0	0
120A		TNGT	4534	4920	15000	0	0	0	0	0	0	0	24	22500	0	0
120B				4613	15000		0	0	0	0	0	0	39	22500	0	0
120B		TNGT	4534	4613	15000	0	0	0	0	0	0	0	39	22500	0	0
120C				4598	15000		0	0	0	0	0	0	58	22500	0	0
120C		TNGT	4534	4598	15000	0	0	0	0	0	0	0	58	22500	0	0
125				5604	15000		0	0	0	0	0	0	464	22500	0	0
125		TNGT	4534	5604	15000	0	0	0	0	0	0	0	464	22500	0	0
130 B				4618	15000		0	0	0	0	0	0	89	22500	0	0
130 B		BEND	4534	4649	15000	0	0	0	0	0	0	0	163	22500	0	0
130 M				4755	15000		0	0	0	0	0	0	173	22500	0	0
130 M		BEND	4534	4755	15000	0	0	0	0	0	0	0	173	22500	0	0
130 E				4807	15000		0	0	0	0	0	0	175	22500	0	0
130 E		TNGT	4534	4734	15000	0	0	0	0	0	0	0	96	22500	0	0
133 B				4742	15000		0	0	0	0	0	0	96	22500	0	0
133 B		BEND	4534	4905	15000	0	0	0	0	0	0	0	229	22500	0	0
133 M				4910	15000		0	0	0	0	0	0	225	22500	0	0
133 M		BEND	4534	4910	15000	0	0	0	0	0	0	0	225	22500	0	0
135				4899	15000		0	0	0	0	0	0	215	22500	0	0
135		TNGT	4534	4738	15000	0	0	0	0	0	0	0	90	22500	0	0
140				4738	15000		0	0	0	0	0	0	89	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 118

CODE B31S73

ELEMENT FROM	ELEMENT TO	ELEMENT TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	LEVEL D EQN 12 CALC PSI	LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
140		TNGT	4534	4738	15000	0	0	0	0	0	0	0	89	22500	0	0
144				4740	15000		0	0	0	0	0	0	86	22500	0	0
144		TNGT	4534	4740	15000	0	0	0	0	0	0	0	86	22500	0	0
145				5327	15000		0	0	0	0	0	0	77	22500	0	0
145		TNGT	4534	5327	15000	0	0	0	0	0	0	0	77	22500	0	0
146				5960	15000		0	0	0	0	0	0	151	22500	0	0
146		TNGT	4534	5960	15000	0	0	0	0	0	0	0	151	22500	0	0
147				5211	15000		0	0	0	0	0	0	134	22500	0	0
147		TNGT	4534	5211	15000	0	0	0	0	0	0	0	134	22500	0	0
150				5192	15000		0	0	0	0	0	0	132	22500	0	0
150		BEND	4534	5711	15000	0	0	0	0	0	0	0	316	22500	0	0
155	M			5649	15000		0	0	0	0	0	0	307	22500	0	0
155	M	BEND	4534	5649	15000	0	0	0	0	0	0	0	307	22500	0	0
155	E			5600	15000		0	0	0	0	0	0	301	22500	0	0
155	E	TNGT	4534	5130	15000	0	0	0	0	0	0	0	126	22500	0	0
160	B			5052	15000		0	0	0	0	0	0	115	22500	0	0
160	B	BEND	4534	5241	15000	0	0	0	0	0	0	0	209	22500	0	0
160	M			5237	15000		0	0	0	0	0	0	203	22500	0	0
160	M	BEND	4534	5237	15000	0	0	0	0	0	0	0	203	22500	0	0
160	E			5241	15000		0	0	0	0	0	0	193	22500	0	0
160	E	TNGT	4534	5051	15000	0	0	0	0	0	0	0	106	22500	0	0
165				5112	15000		0	0	0	0	0	0	88	22500	0	0
165		TNGT	4534	5112	15000	0	0	0	0	0	0	0	88	22500	0	0
165A				4847	15000		0	0	0	0	0	0	50	22500	0	0
165A		TNGT	4534	4847	15000	0	0	0	0	0	0	0	50	22500	0	0
165B				5388	15000		0	0	0	0	0	0	21	22500	0	0
165B		TNGT	4534	5388	15000	0	0	0	0	0	0	0	21	22500	0	0
165C				5579	15000		0	0	0	0	0	0	38	22500	0	0
165C		TNGT	4534	5579	15000	0	0	0	0	0	0	0	38	22500	0	0
170				5505	15000		0	0	0	0	0	0	108	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 119

CODE B31S73

ELEMENT FROM	ELEMENT TO	TYPE	TITLE	SUSTAINED LOAD EQN 11 PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
170		TNGT		4534	5527	15000	0	0	0	0	0	0	0	110	22500	0	0
175					5554	15000		0	0	0	0	0	0	130	22500	0	0
175		TNGT		4383	6496	15000	0	0	0	0	0	0	0	270	22500	0	0
180					4683	15000		0	0	0	0	0	0	96	22500	0	0
180		TNGT		4383	4683	15000	0	0	0	0	0	0	0	96	22500	0	0
230	B				4622	15000		0	0	0	0	0	0	98	22500	0	0
230	B	BEND		4383	4702	15000	0	0	0	0	0	0	0	175	22500	0	0
230	M				4722	15000		0	0	0	0	0	0	191	22500	0	0
230	M	BEND		4383	4722	15000	0	0	0	0	0	0	0	191	22500	0	0
230	E				4728	15000		0	0	0	0	0	0	211	22500	0	0
230	E	TNGT		4383	4641	15000	0	0	0	0	0	0	0	119	22500	0	0
230A					4667	15000		0	0	0	0	0	0	139	22500	0	0
230A		TNGT		4383	4667	15000	0	0	0	0	0	0	0	139	22500	0	0
235	B				4848	15000		0	0	0	0	0	0	161	22500	0	0
235	B	BEND		4383	5005	15000	0	0	0	0	0	0	0	287	22500	0	0
235	M				5189	15000		0	0	0	0	0	0	306	22500	0	0
235	M	BEND		4383	5189	15000	0	0	0	0	0	0	0	306	22500	0	0
235	E				5271	15000		0	0	0	0	0	0	311	22500	0	0
235	E	TNGT		4383	5047	15000	0	0	0	0	0	0	0	175	22500	0	0
D90					5097	15000		0	0	0	0	0	0	266	22500	0	0
115		TNGT		4534	5055	15000	0	0	0	0	0	0	0	138	22500	0	0
240					5249	15000		0	0	0	0	0	0	149	22500	0	0
240		TNGT		4383	5865	15000	0	0	0	0	0	0	0	309	22500	0	0
240A					5121	15000		0	0	0	0	0	0	89	22500	0	0
240A		TNGT		4383	5121	15000	0	0	0	0	0	0	0	89	22500	0	0
245	B				4573	15000		0	0	0	0	0	0	129	22500	0	0
245	B	BEND		4383	4637	15000	0	0	0	0	0	0	0	229	22500	0	0
245	M				4433	15000		0	0	0	0	0	0	268	22500	0	0
245	M	BEND		4383	4433	15000	0	0	0	0	0	0	0	268	22500	0	0
245	E				4746	15000		0	0	0	0	0	0	282	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
A.P. 2, P. 120

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
245 E	TNGT	4383	4654	15000	0	0	0	0	0	0	0	158	22500	0	0
250			5035	15000		0	0	0	0	0	0	154	22500	0	0
250	TNGT	4383	5035	15000	0	0	0	0	0	0	0	154	22500	0	0
255 B			4752	15000		0	0	0	0	0	0	141	22500	0	0
255 B	BEND	4383	4876	15000	0	0	0	0	0	0	0	251	22500	0	0
255 M			4881	15000		0	0	0	0	0	0	236	22500	0	0
255 M	BEND	4383	4881	15000	0	0	0	0	0	0	0	236	22500	0	0
255 E			4905	15000		0	0	0	0	0	0	213	22500	0	0
255 E	TNGT	4383	4774	15000	0	0	0	0	0	0	0	120	22500	0	0
C90			4823	15000		0	0	0	0	0	0	171	22500	0	0
170	TNGT	4383	4515	15000	0	0	0	0	0	0	0	211	22500	0	0
170A			4529	15000		0	0	0	0	0	0	169	22500	0	0
170A	TNGT	4383	4529	15000	0	0	0	0	0	0	0	169	22500	0	0
170B			4451	15000		0	0	0	0	0	0	178	22500	0	0
170B	TNGT	4383	4451	15000	0	0	0	0	0	0	0	178	22500	0	0
260 B			4766	15000		0	0	0	0	0	0	205	22500	0	0
260 B	BEND	4383	4895	15000	0	0	0	0	0	0	0	365	22500	0	0
260 M			5118	15000		0	0	0	0	0	0	388	22500	0	0
260 M	BEND	4383	5118	15000	0	0	0	0	0	0	0	388	22500	0	0
260 E			5227	15000		0	0	0	0	0	0	415	22500	0	0
260 E	TNGT	4383	5015	15000	0	0	0	0	0	0	0	233	22500	0	0
B90			5096	15000		0	0	0	0	0	0	384	22500	0	0
B97	TNGT	5866	6107	15000	0	0	0	0	0	0	0	202	22500	0	0
S01			6442	15000		0	0	0	0	0	0	183	22500	0	0
S01	TNGT	5866	6442	15000	0	0	0	0	0	0	0	183	22500	0	0
A97			6806	15000		0	0	0	0	0	0	167	22500	0	0
C97	TNGT	5866	6193	15000	0	0	0	0	0	0	0	180	22500	0	0
MS2			7083	15000		0	0	0	0	0	0	172	22500	0	0
MS2	TNGT	5866	7083	15000	0	0	0	0	0	0	0	172	22500	0	0
B97			6123	15000		0	0	0	0	0	0	165	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1 App. 2, A 121

CODE B31S73

ELEMENT FROM TO	TYPE TITLE	SUSTAINED LOAD PD/4T PSI	SUSTAINED LOAD EQN 11 CALC PSI	SUSTAINED LOAD EQN 11 ALLOW PSI	OCCASIONAL LOAD LEVEL B EQN 12 PD/4T PSI	OCCASIONAL LOAD LEVEL B EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL B EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL C EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL C EQN 12 ALLOW PSI	OCCASIONAL LOAD LEVEL D EQN 12 CALC PSI	OCCASIONAL LOAD LEVEL D EQN 12 ALLOW PSI	THERMAL EXPANSION EQNS 13/14 CALC PSI	THERMAL EXPANSION EQNS 13/14 ALLOW PSI	NON-REPEATED ANCHOR MOV EQN *** CALC PSI	NON-REPEATED ANCHOR MOV EQN *** ALLOW PSI
D97	TNGT	5866	6843	15000	0	0	0	0	0	0	0	29	22500	0	0
S00			6519	15000		0	0	0	0	0	0	30	22500	0	0
S00	TNGT	5866	6519	15000	0	0	0	0	0	0	0	30	22500	0	0
C97			6173	15000		0	0	0	0	0	0	31	22500	0	0
A07	TNGT	4753	4753	15000	0	0	0	0	0	0	0	0	22500	0	0
AR5			4753	15000		0	0	0	0	0	0	0	22500	0	0
B07	TNGT	4753	4753	15000	0	0	0	0	0	0	0	0	22500	0	0
BR5			4753	15000		0	0	0	0	0	0	0	22500	0	0
C07	TNGT	4753	4753	15000	0	0	0	0	0	0	0	0	22500	0	0
CR5			4753	15000		0	0	0	0	0	0	0	22500	0	0
D07	TNGT	4753	4753	15000	0	0	0	0	0	0	0	0	22500	0	0
DR5			4753	15000		0	0	0	0	0	0	0	22500	0	0

* EXCEEDED ALLOWABLE IN EQUATION 13, EQUATION 14 USED
** EXCEEDED ALLOWABLE

Calc. 1-1 R.1
App. 2, p. 122

ANALYSIS INPUT DATA

PROJECT

JOB NO. 03-00525 PLANT DESIGN GROUP

SYSTEM U3 MAIN STEAM LINES O/C

CALC NO 1-1 ISO NO REV NO

CASES: WT02 THRM01

PIPING DATA		1	2	3	4
2) MATERIAL					
3) E	(PSI)	.260+08	.260+08	.260+08	.260+08
4) PIPE OD	(IN)	26.000	48.000	36.000	28.000
5) NOM WALL	(IN)	.950	2.000	2.000	1.250
6) DESN PRES	(PSI)	1115.000	1115.000	1115.000	1115.000
7) PEAK PRES	(PSI)	1337.000	1337.000	1337.000	1337.000
8) TEMP	(DEG-F)				
9) EXPAN	(IN/100-FT)				
10) EXPAN	(IN/IN)				
11) WT PIPE	(LB/FT)	.000	.000	.000	.000
12) WT CONTNT	(LB/FT)	.000	.000	.000	.000
13) WT INSUL	(LB/FT)	.000	.000	.000	.000
14) WT MISC.	(LB/FT)	284.000	284.000	284.000	389.000
15) TOTAL WT	(LB/FT)	284.000	284.000	284.000	389.000

VALVE DATA

1) VALVE SZ & NO
2) LENGTH (E-E) (IN)
3) OPR YOKE LEN (IN)
4) WT BODY (LB)
5) WT OPERATOR (LB)
6) WT CONTENTS (LB)
7) WT INSUL (LB)
8) TOTAL WT (LB)

INPUT SOURCE DOCUMENTS

1) PIPING SPECIFICATION

2) VALVE DRAWINGS

	NAME	SIGNATURE	DATE
PREPARED BY			
REVIEWED BY			
APPROVED BY			

Calc. 1-1 R.1
App. 2, P. 123

ANALYSIS INPUT DATA

PROJECT

JOB NO. 03-00525 PLANT DESIGN GROUP

SYSTEM U3 MAIN STEAM LINES O/C

CALC NO 1-1 ISO NO REV NO

CASES: WT02 THRM01

PIPING DATA		5	6	7	8
2) MATERIAL					
3) E	(PSI)	.260+08	.260+08	.260+08	.260+08
4) PIPE OD	(IN)	14.000	18.000	18.000	48.000
5) NOM WALL	(IN)	.750	.937	.937	2.000
6) DESN PRES	(PSI)	1115.000	1115.000	1115.000	1115.000
7) PEAK PRES	(PSI)	1337.000	1337.000	1337.000	1337.000
8) TEMP	(DEG-F)				
9) EXPAN	(IN/100-FT)				
10) EXPAN	(IN/IN)				
11) WT PIPE	(LB/FT)	.000	.000	.000	.000
12) WT CONTNT	(LB/FT)	.000	.000	.000	.000
13) WT INSUL	(LB/FT)	.000	.000	.000	.000
14) WT MISC.	(LB/FT)	124.000	193.000	3621.000	.000
15) TOTAL WT	(LB/FT)	124.000	193.000	3621.000	.000

VALVE DATA

1) VALVE SZ & NO
2) LENGTH (E-E) (IN)
3) OPR YOKE LEN (IN)
4) WT BODY (LB)
5) WT OPERATOR (LB)
6) WT CONTENTS (LB)
7) WT INSUL (LB)
8) TOTAL WT (LB)

INPUT SOURCE DOCUMENTS

1) PIPING SPECIFICATION

2) VALVE DRAWINGS

	NAME	SIGNATURE	DATE
PREPARED BY			
REVIEWED BY			
APPROVED BY			

Calc. 1-1 R.1
App. 2, p. 124

ANALYSIS INPUT DATA

PROJECT

JOB NO. 03-00525 PLANT DESIGN GROUP

SYSTEM U3 MAIN STEAM LINES O/C

CALC NO 1-1 ISO NO REV NO

CASES: WT02 THRM01

PIPING DATA		9
2) MATERIAL		
3) E	(PSI)	.260+08
4) PIPE OD	(IN)	20.000
5) NOM WALL	(IN)	1.000
6) DESN PRES	(PSI)	1115.000
7) PEAK PRES	(PSI)	1337.000
8) TEMP	(DEG-F)	
9) EXPAN	(IN/100-FT)	
10) EXPAN	(IN/IN)	
11) WT PIPE	(LB/FT)	.000
12) WT CONTNT	(LB/FT)	.000
13) WT INSUL	(LB/FT)	.000
14) WT MISC.	(LB/FT)	209.000
15) TOTAL WT	(LB/FT)	209.000

VALVE DATA

1) VALVE SZ & NO
2) LENGTH (E-E) (IN)
3) OPR YOKE LEN (IN)
4) WT BODY (LB)
5) WT OPERATOR (LB)
6) WT CONTENTS (LB)
7) WT INSUL (LB)
8) TOTAL WT (LB)

INPUT SOURCE DOCUMENTS

1) PIPING SPECIFICATION

2) VALVE DRAWINGS

	NAME	SIGNATURE	DATE
PREPARED BY			
REVIEWED BY			
APPROVED BY			

Calc. 1-1 R.1
App. 2, p. 125

ANSI-B31.1

PROJECT

JOB NO. 03-00525 PLANT DESIGN GROUP

SYSTEM U3 MAIN STEAM LINES O/C

CALC NO 1-1 ISO NO REV NO

DESIGN CONDITION	LEVEL	LOCATION OF MAXIMUM END	LOCATION OF MAXIMUM ELEMENT	MAXIMUM COMPUTED STRESS(PSI)	ALLOWABLE STRESS (PSI)	COMPUTED / ALLOWABLE
SUSTAINED LOADS EQN. 11		B50	B45E B50	7864	SH 15000	.524
THERMAL EXPANSION EQN. 13		D07	D06 D07	8334	SA 22500	.370

REFERENCE CALCULATIONS:

WEIGHT

THERMAL EXP

SEISMIC-INERTIA PORTION

SEISMIC-ANCHOR MOVEMENT

DYNAMIC

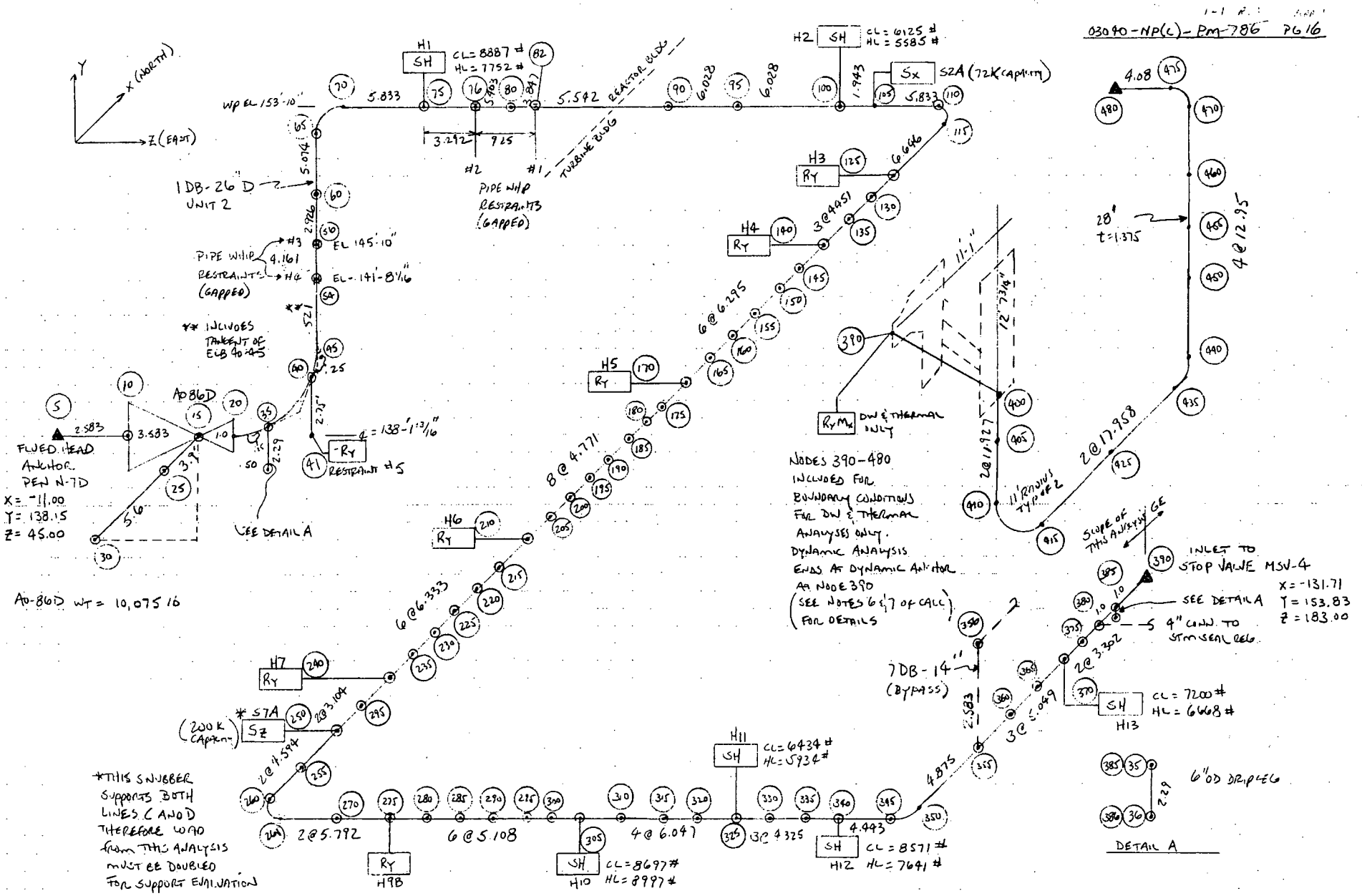
OTHERS

	NAME	SIGNATURE	DATE
PREPARED BY			
REVIEWED BY			
APPROVED BY			

ME101SA Version N2 stop on 09/26/03 at 02:24:48
ME101SA Version N2 run time .45 seconds

* For Complete ME101 output, See page 107 of APP-1 microfiche (Job 24236, dated 02/12/04)

Calc. 1-1 R.1 Att. 2, p. 126 of 126


Y
X (NORTH)
Z (EAST)
WP EL 153'-10"
1DB-26" D
UNIT 2
H1 SH CL=8887 # HL=7752 #
H2 SH CL=6125 # HL=5585 #
Sx S2A (72K capacity)
REACTOR BLDG
TURBINE BLDG
PIPE WHIP RESTRAINTS (GAPPED)
H3 RY
H4 RY
H5 RY
H6 RY
H7 RY
PIPE WHIP RESTRAINTS (GAPPED)
EL 145'-10"
EL 141'-8 1/16"
** INCLUDES THICKNESS OF ELB 90 = 2.5
FLUED HEAD ANCHOR PEN N-7D
X = -11.00
Y = 138.15
Z = 45.00
AD-86D
AD-86D WT = 10,075 lb
SEE DETAIL A
RESTRAINT #5
NODES 390-480 INCLUDED FOR BOUNDARY CONDITIONS FOR DW & THERMAL ANALYSES ONLY. DYNAMIC ANALYSIS ENDS AT DYNAMIC ANCHOR AT NODE 390 (SEE NOTES 6 & 7 OF CALC FOR DETAILS)
DW & THERMAL ONLY
11 RADIUS TYP OF 2
SCOPE OF THIS ANALYSIS GE
INLET TO STOP VALVE MSV-4
X = -131.71
Y = 153.83
Z = 183.00
SEE DETAIL A
4" CONN. TO STM SEAL REG
7DB-14" (Bypass)
H13 SH CL = 7200 # HL = 6668 #
H11 SH CL=6434 # HL=5934 #
H12 SH CL = 8571 # HL = 7641 #
H10 SH CL=8697 # HL=8997 #
H9B RY
*S7A (200K Capacity) S7
*THIS SNUBBER SUPPORTS BOTH LINES C AND D THEREFORE LOAD FROM THIS ANALYSIS MUST BE DOUBLED FOR SUPPORT EVALUATION
6" OD DRIP LEG
DETAIL A