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# CALCULATION PACKAGE SUPPORTING HI-STORM FSAR REVISIONS

FOR

*HOLTEC*

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In accordance with the Holtec Quality Assurance Manual and associated Holtec Quality Procedures (HQPs), this document is categorized as a:

X Calculation Package[3] (Per HQP 3.2)

☐ Technical Report (Per HQP 3.2) (Such as a Licensing Report)

Design Criterion Document (Per HQP 3.4)

☐ Design Specification (Per HQP 3.4)

☐ Other (Specify):

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- All significant assumptions are stated.
- The analysis methodology is consistent with the physics of the problem.
- Any computer code and its specific versions used in the work have been formally admitted for use within the company's QA system.
- The format and content of the document is in accordance with the applicable Holtec quality procedure.
- The material content of the report is understandable to a reader with the requisite academic training and experience in the underlying technical disciplines.

Once a safety significant document, such as this report, completes its review and certification cycle, it should be free of any materially significant error and should not require a revision unless its scope of treatment needs to be altered. Except for regulatory interface documents (i.e., those that are submitted to the NRC in support of a license amendment and request), editorial revisions to Holtec *safety significant* documents are not made unless such editorial changes are deemed necessary by the Holtec Project Manager to prevent erroneous conclusions from being inferred by the reader. In other words, the focus in the preparation of this document is to ensure correctness of the technical content rather than the cosmetics of presentation".

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## REVISION LOG[1]

Revision 0 – Original Issue

The original issue of this report contains Supplement 1. Supplement 1 includes all supporting calculations not given in the FSAR(TSAR) or in support of FSAR or certain ECO analyses up to Aug. 31, 2000.

Revision 1

Added Supplement #2 containing a calculation supporting acceleration ratio listed in section 3.4 ( page 3.4-100) of LAR#1 to HI-STORM FSAR

Revision 2

[1] The revision status of Holtec documents is subject to updates as the project progresses. This document will be revised if a revision to any of the above-referenced Holtec work products materially affects the instructions, results, conclusions or analyses contained in this document. Otherwise, a revision to this document will not be made and the latest revision of the referenced Holtec documents shall be assumed to supersede the revision numbers cited above. The Holtec Project Manager bears the undivided responsibility to ensure that there is no intra-document conflict with respect to the information contained in all Holtec generated documents on a safety significant project.

This revision supports Proposed Revision 1B. It contains Supplement 2 consisting of 7 calculations. These calculations support the submittal responding to RAI#1 on LAR 1014-1. The first 6 calculations address specific ECO's (Engineering Change Orders) and/or RAI responses, and/or direct changes to the FSAR. Calculation 7 is a compendium of all figures and stress input and output tables that had previously been in the FSAR but are now relocated to the Calculation Package. Appendices 3.N-3.T have been relocated in their entirety (including the MPC 32 stress calculations that were introduced when Proposed Revision 1 was originally submitted. Stress output for the MPC-24E in archived in this calculation 7. The footers in these appendices keep the designation of 3.N-x, etc. for page numbering.

## PREFACE

This Calculation Package has been prepared pursuant to the provisions of Holtec Quality Procedures HQP 3.0 and 3.2, which require that all analyses utilized in support of the design of a safety-related or important-to-safety structure, component, or system be fully documented such that the analyses can be reproduced at *any time in the future* by a specialist trained in the discipline(s) involved. HQP 3.2 sets down a rigid format structure for the content and organization of Calculation Packages that are intended to create a document that is complete in terms of the exhaustiveness of content. The Calculation Packages, however, lack the narration smoothness of a Technical Report, and are not intended to serve as a Technical Report.

Because of the Calculation Package's function as a repository of all analyses performed on the subject of its scope, this document is typically revised only if an error is discovered in the computations or the equipment design is modified. Additional analyses in the future will be added as numbered supplements to this Package. Each time a supplement is added or the existing material is revised, the revision status of this Package is advanced to the next number and the Table of Contents is amended.

# 1.0 INTRODUCTION AND SCOPE

This Calculation Package is compiled to provide archival information to supplement the material presented in the FSAR (and the previous TSAR) [11.2.2], specifically Chapter 3, and to support any 72.48 modifications and ECO's. It also serves, in the future, to support analyses documented in the FSAR for HI-STORM, HI-2002444 as it progresses through updates. The material presented in this Calculation Package is not needed to comprehend the material presented in the above-mentioned Technical Report (which is a self-contained document in full compliance with the USNRC regulations), unless the reader wishes to examine the computational details. This calculation package is a "follow on" report to HI-981928 [11.2.1], which is the calculation package that documents and supports HI-STORM FSAR submittals up to and through June 2000. Herein, we document only specific "singular" calculations that support a specific FSAR summarized result. Where a large body of calculations is necessary to support a FSAR conclusion (such as high seismic supports for anchored casks, for example), this calculation package is supplemented by other specialized reports that deal exclusively with the single topic requiring a substantial calculation effort. The results from these specialized calculation packages are simply summarized in the FSAR.

Because of its function as a repository of analyses performed on the subject of its scope, this document will be revised only if an error is discovered in the computations or the equipment design is modified. Additional analyses in the future, supporting either a new FSAR amendment or a change supported by a 72.48 evaluation, will be added as numbered supplements to this

Package. (Each time a supplement is added or the existing material is revised, the revision status of this Package is advanced to the next number and the Table of Contents is amended).

In order to fully understand the format and layout of this Calculation Package, it is necessary to understand its two key attributes. First, unlike most calculation packages, this package contains a multitude of discrete analyses, all of which share a common body of input data, but are otherwise entirely distinct in their methods, models, and computer simulations. This calculation package is in fact a compendium of an array of distinct calculations.

Revision 0 is the first issue of the calculation package that serves as the follow-on to the previous calc package [11.2.1] (Note that an initial Rev. 11 TSAR submittal was in the first half of 2000 and the supporting calculations and updated weight tables are in [11.2.1].) Reference [11.2.1] is now complete unless revised. All new FSAR submittals or 72.48 evaluations requiring structural calculations are supported by the work herein and by other specialized calculation packages. The use of the terminology "FSAR" is appropriate when the citation or comment is to HI-951312. The term "FSAR" implies the FSAR when the citation or comment is to HI-2002444.

## 2.0 METHODOLOGY

Calculation specific appendices are attached to this report. In general, the problem descriptions are provided in the introductory section of each calculation in the FSAR document [11.2.2]. The problem descriptions, unique to each calculation, include the description of the component to be analyzed, the nature and source of the applied loading on the component, and the acceptance criteria. Where the calculation is performed to support a 72.48 evaluation, and does not yet appear in summary form in the FSAR, the calculation itself is complete insofar as having a full description of the problem, methodology, etc.

All structural calculations are either based on classical strength of materials solutions, or are based on finite element numerical analysis. Each calculation contains detailed explanation of the analysis methods. As noted earlier, this Calculation Package contains supporting calculations for results that may only be summarized in the FSAR [11.2.2]. Where the work supports a detailed appendix that is included in the FSAR, no detailed text is included within the supporting calculation herein except to describe the nature of the supporting calculation.

# 3.0 ACCEPTANCE CRITERIA

This calculation package contains one or more appendices that deal with specific calculation items. If acceptance criteria are different for the individual calculations, then the appropriate acceptance criteria associated with each individual calculation are stated within the specific appendix.

The design criteria are compiled in the FSAR in Chapter 2.0. The design criteria represent the basis for the acceptance criteria for the design of the HI-STORM, the MPC, and the HI-TRAC. The stress intensity limit for the confinement and the nonconfinement boundaries are listed in the FSAR in Tables 2.2.10 through 2.2.12. (The ASME Code stress allowable associated with the stress intensity limits are listed in the FSAR in Tables 3.1.6 through 3.1.17.) The applicable design codes for cask components are listed in the FSAR in Tables 2.2.6. and 2.2.7.

## 4.0 ASSUMPTIONS

In general, each calculation in this package or in the FSAR contains a unique set of conservative analysis assumptions. In most cases these assumptions are listed under a separate section in each of the calculations; for some calculations that supplement work already detailed in the FSAR or in another calculation, references are made to the originating document section for the assumptions.

## 5.0 INPUT DATA

Input data is provided in the calculation appendices as needed for the specific analysis. Data input requirements for geometry, material properties, and applicable load combinations are provided below:

The sources for the input data that are specific to a calculation are provided within that calculation.

Calculation number 1 in HI-981928 [11.2.1] contains the Excel spreadsheets that are the bases for the cask component weight calculation, with its own source of input data. The weight calculations have performed using drawings appropriate to Revision 11 of the FSAR [11.2.2] supported by the portion of Rev. 11 submitted in the first half of 2000. Where weight modifications for subsequent revisions of the FSAR are required, these changed (or added) weights are documented in this calculation package in the supplement supporting the FSAR revision.

The sources of the input data that are repetitively used are listed as references in Section 11. The global sources of input data are compiled below for quick reference. The drawings revision numbers are omitted here. Applicable revision numbers are found in Section 1.5 of the FSAR.

| | |
|---|---|
| HI-STORM Dimensions: | Holtec Drawing Nos. 1495 & 1561 |

| | |
|---|---|
| HI-STORM 100S Dimensions | Holtec Drawing Nos. 3669 |
| 125 Ton HI-TRAC Dimensions: | Holtec Drawing Nos. 1880 & 1928 |
| 100 Ton HI-TRAC Dimensions: | Holtec Drawing Nos. 2145 & 2152 |
| MPC(24) Dimension: | Holtec Drawing Nos.1395 & 1396 |
| MPC(32) Dimensions: | Holtec Drawing Nos. 1392 & 1393 |
| MPC(68) Dimensions: | Holtec Drawing Nos.1401 & 1402 |
| MPC(24E) Dimensions | Holtec Drawing Nos. 2889-2892 |
| HI-STORM Weight: | Table 3.2.1 of [11.2.2] |
| HI-TRAC Weight: | Table 3.2.2 of [11.2.2] |
| MPC Weight: | Table 3.2.1 of [11.2.2] |
| Center of Gravity: | Table 3.2.3 of [11.2.2] |

| | |
|---|---|
| Design Pressure: | FSAR, Table 2.2.1 |
| Component Design Temperature: | FSAR, Table 2.2.3 |
| Mechanical Properties: | FSAR, Tables 3.3.1 through 3.3.5 |
| Material Strength: | FSAR, Tables 3.1.6 through 3.1.17 |

The current weight analysis is as documented in HI-981198, (latest and final revision). However, the weight tables in Sec. 3.2 have been updated to reflect the additional weight of 2000 lb. from the anchoring system. The current spreadsheets within HI-981928 do not reflect this change. However, the spreadsheets have been moved to the HI-2002481 /Rev 0 directory and have been updated.

# 6.0 COMPUTER CODES

The main section of this report is written using Microsoft Word (Office 2000), while the calculation appendices are prepared using MathCad (Version 2000 unless otherwise noted below), or are also written in MS Word and contain manual calculations and/or finite element results. The computer codes used are documented and referenced within each supplement.

All computer codes used for the analysis and design of HI-STORM, HI-TRAC, and MPC are approved under Holtec's QA program. The FSAR, in Section 3.6.2, contains a concise description of all applicable computer codes.

# 7.0 ANALYSES

Analyses to support the FSAR amendments and 72.48 evaluations are contained in supplements that contain a series of appendices. As new supporting calculations are added, the revision log and the table of contents will note the additions or modifications to this document.

## 8.0 COMPUTER FILES

All relevant computer files associated with this calculation package are archived on the Holtec Server. A directory listing appropriate to the supplements is included within each supplement.

## 9.0 RESULTS OF ANALYSES

All calculations are documented in the FSAR along with an evaluation of the analysis. The analysis evaluation contains details of the analysis results and the comparison of the result to applicable code allowables. The design adequacy is also conclusively demonstrated by the computation of the positive margins of safety. The specific calculations within each supplement also evaluate, if applicable, the margins of safety and the results where applicable.

## 10.0 SUMMARY AND CONCLUSIONS

The backup calculation package supports the structural integrity evaluation of the HI-STORM 100 System required by the 10CFR72 FSAR Submittal [11.2.2] and also supports interim 72.48 evaluations. All analysis calculations and documentation meet Holtec's Q.A requirements and procedures.

# 11.0 REFERENCES

## *11.1 Generic References*

A comprehensive list of all references that may be applicable to some or all of the specific calculations performed within this document are given below. Not all references need to be cited within this document to be contained in this comprehensive listing.


[11.1.1] NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," United States Nuclear Regulatory Commission.

[11.1.2] ANSI N14.6-1993, "American National Standard for Special Lifting Devices for Shipping Containers Weighing 10000 Pounds (4500 kg) or More for Nuclear Materials," American National Standards Institute, Inc.

[11.1.3] D. Burgreen, Design Methods for Power Plant Structures, Arcturus Publishers, 1975.

[11.1.4] NUREG/CR-1815, "Recommendations for Protecting Against Failure by Brittle Fracture in Ferritic Steel Shipping Containers Up to Four Inches Thick".

[11.1.5] ASME Boiler & Pressure Vessel Code, Section II, Part D, 1998.

[11.1.6] American Concrete Institute, "Building Code Requirements for Reinforced Concrete (ACI 318-95) and Commentary - ACI 318R-95", or Latest Edition.

[11.1.7] American Concrete Institute, "Code Requirements for Nuclear Safety Related Structures" (ACI-349-85 to95) and Commentary (ACI-349R-85 to95).

[11.1.8] ASME Boiler & Pressure Vessel Code, Section III, Subsection NF, 1998.

[11.1.9] ASME Boiler & Pressure Vessel Code, Section III, Appendices, 1998.

[11.1.10] ASME Boiler & Pressure Vessel Code, Section III, Subsection NB, 1998.

[11.1.11] Theory of Elastic Stability, S.P. Timoshenko and J. Gere, McGraw Hill, 2nd Edition.

[11.1.12] Marks Standard Handbook for Mechanical Engineering, 9th Ed.

[11.1.13] ASME Boiler and Pressure Vessel Code, Section III, Subsection NG, 1998.

[11.1.14] Manual of Steel Construction – Load and Resistance Factor Design, 1st Edition, AISC, 1986.

[11.1.15] Manual of Steel Construction, AISC.

[11.1.16] Mechanical Engineering Design, J. Shigley, and C. Mischke, 5th Edition, McGraw-Hill, 1989.

[11.1.17] Mechanical Design of Heat Exchangers and Pressure Vessel Components, K.P. Singh, and A.I. Soler, Arcturus Publishers, 1984.

[11.1.18] Strength of Materials, S.P Timoshenko, Vols: I, and II, 3rd Edition, Van Nostrand, 1955.

[11.1.19] Mechanical Design and Systems Handbook, H. Rothbart, Editor, 2nd Edition, McGraw-Hill, 1985.

[11.1.20] Theory of Elasticity, S.P. Timoshenko, and J. Goodier, 3rd Edition, McGraw-Hill, 1951.

[11.1.21] Theory of Elastic Stability, S.P. Timoshenko, and J.M. Gere, 2nd Edition, Mcgraw-Hill, 1961.

## *11.2 Specific References*

In addition to the comprehensive reference list provided in Appendix B, additional project specific references are cited below. If any reference cited below conflicts with an identical reference in Appendix B (e.g., a different applicable year for a Code or Standard), then the specific reference takes precedence.

[11.2.1] HI-981928, HI-STORM 100 CALCULATION PACKAGE, Latest Revision, 1998.

[11.2.2] HI-951312, HI-STORM 100 FSAR, Chapter 3, Latest Revision, 1999. This document has now become HI-2002444, HI-STORM 100 FSAR, Rev. 0 and Proposed Revision 1.

[11.2.3] HI-STORM 100 Storage System Design Specification; HOLTEC Report HI-961555, Revision 0.

[11.2.4] MPC Drawings (Section 1.5 in [11.2]).

[11.2.5] HI-STORM Drawings: ( see Section 1.5 in [11.2])

[11.2.6] HI-TRAC Drawings: (see Section 1.5 in [11.2])

[11.2.7] Structural Calculation Package for HI-STORM –100, Holtec Report HI-961589, Revision 1, 2/28/97.

# 12.0 LIST OF SUPPLEMENTS

## *12.1 Supplement 1*

This supplement contains the following items

App. A – Calculations supporting the structural implication of the thermosiphon effect.

App. B – I/O from finite element analysis of the 24E fuel basket. No discussion of the problem is given

App. C – Trunnion interface stress analysis (This appendix is also in HI-981928 last revision)

App. D – Miscellaneous calculations supporting work in Sec. 3.4 not documented elsewhere.

App. 3.AT – A stress calculation supporting an ECO for alternate construction of HI-TRAC water jacket. This will be issued as a 72:48 in 2001. The calc was requested in Aug. 2000. to support the proposed ECO.

App. 3.AU- The large missile impact evaluation on HI-TRAC is redone here to support the ECO for the alternate construction of the HI-TRAC water jacket.

## *12.2 Supplement 2*

This supplement adds a calculation of the ratio of max. rigid body accelerations of HI-STORM 100S to HI-STORM 100. It supports the contention that the results for the HI-STORM 100 bound the results for the HI-STORM 100S as far as the non-mechanistic tipover is concerned. This calculation was should have been added when LAR#1 was submitted but was "missed". The addition of this supplement brings the calc package up to date.

### 12.3 Supplement 3

Calculations 1 and 2 support ECO changes brought on by RAI questions.
Calculation 3 replaces Appendices 3.AO and 3.AP that have been modified by changes to the HI-STORM 100S lid required to rfespond to reviewers comments
Calculation 4 is a sample anchor receptacle design analysis to support the typical configuration shown in Fig. 2.A.1 in Chapter 2 of the FSAR.
Calculation 5 presents theory formulas for evaluating load paths for anchored casks during preload and operational conditions
Calculation 6 is Appendix 3.D in the FSAR with specific results and discussion appropriate to the HI-STORM 100S lid. This rewrite was necessary because the two lids (100 vs. 100S) are sufficiently different in how load is supported that a single appendix could no longer be supported.
Calculation 7 is a compendium of figures and appendices that have been relocated from the FSAR to the Calc. Package based on agreements with the NRC staff. It

also contains results of new finite element analyses in support of the analysis of the MPC24E fuel basket.

The supplement contains the director listing for this revision of the report.

# SUPPLEMENT # 1 COVER PAGE

Revision 11 of the HI-STORM TSAR includes the thermosiphon effect. This alters the MPC temperature distribution. Therefore, the finite element solution results reported in Table 3.4.8 of the TSAR and discussed in Subsection 3.4.4.3.1.2 have been revised. This appendix provides the archival information necessary

The revised thermal analysis on MPC-24, MPC-24E, MPC-32, and MPC-68 has resulted in temperature distribution solutions significantly different from those obtained in the previous calculation. The new temperature results are summarized in Tables 4.4.19, 4.4.10, 4.4.9, 4.4.26, and 4.4.27 of the TSAR (Holtec Report No. HI-951312). Consequently, the stress analysis on the MPC needs to be updated. This appendix documents the MPC stress analysis using the new temperature results.

In review of the temperature results, MPC-68 is identified to have the maximum temperature gradient across the thickness of its structural members. Therefore, the MPC-68 temperature results are used in the stress analysis, and the results bound the stresses in other MPCs.

The stress analysis is performed using the same ANSYS model developed before for analyzing the MPC subjected to combined pressure and temperature loads. The only modification to the ANSYS model is the temperature load. Note that the geometric configuration of the ANSYS model is conservatively constructed to yield the maximize stress for all types of MPCs. The ANSYS input file is attached at the end of this attachment.

Results of the stress analysis are extracted from the ANSYS output file, result68, and summarized in Table 3.4.8 of the TSAR.

The input and output files as well as this attachment are zipped up and stored under the following Holtec ZIP FILE

calc3-attach.zip in the directory listed in the footer (except on the server)

The fortran listing of the relevant input files are given below:

# THERMAL INPUT CODE TO DEFINE TEMPERATURES FOR ANSYS INPUT

```
C   program to compute temperatures for confinement press/temp stress
c input is from temperature info from thermal     5/24/98
      dimension tt(150)
      read(*,*)ta,tb,tc,td
      read(*,*) te,tf,tg,th
      read(*,*) ti,dt,dt1
      tt(1)=ta
      tt(11)=tc
       tt(45)=tb
      tt(55)=td
      tt(111)=tf
      tt(108)=th
      tt(131)=te
      tt(106)=tg
      tt(81)=ti
      tt(76)=tc
      tt(86)=tg+dt
      tt(56)=td
c   temporary nodes for thermal description of base tt121 is redefined later
c   tt 141 is not used but is coincident with node 106
      tt(141)=tt(106)
      tt(121)=tt(108)
       tt(107)=0.5*(tt(108)+tt(106))
1000   format(1x,'BF,',1x,i3,1x,',TEMP,',f8.2)
c   top lid nodes
        ns=1
        es=1.
        ne=11
        er=11.
       do 1,i=ns,ne
       tt(i)=tt(ne)+(tt(ns)-tt(ne))*(1-((i-es)/(er-es))**2)
       write(*,1000)i,tt(i)
1      continue
        ns=45
        es=45.
        ne=55
         ee=55.
       do 2,i=ns,ne
       tt(i)=tt(ne)+(tt(ns)-tt(ne))*(1-((i-es)/(ee-es))**2)
       write(*,1000)i,tt(i)
2      continue
        ns=12
        ne=22
        nu=33
        nd=11
       do 3,i=ns,ne
       tt(i)=tt(i-nd)+.25*(tt(i+nu)-tt(i-nd))
       write(*,1000)i,tt(i)
3      continue
        ns=23
        ne=33
        nu=22
```

```
        nd=22
       do 4,i=ns,ne
       tt(i)=tt(i-nd)+.5*(tt(i+nu)-tt(i-nd))
       write(*,1000)i,tt(i)
4      continue
        ns=34
        ne=44
        nu=11
        nd=33
       do 5,i=ns,ne
       tt(i)=tt(i-nd)+.75*(tt(i+nu)-tt(i-nd))
       write(*,1000)i,tt(i)
5      continue
c   now do shell
         ns=56
        es=56.
        ne=76
        ee=76.
       do 6,i=ns,ne
       y=(i-es)/(ee-es)
       tt(i)=tt(ns)+(tt(ne)-tt(ns))*(y*(2-y))
       write(*,1000)i,tt(i)
6      continue
         ns=76
        es=76.
        ne=81
        ee=81.
       do 7,i=ns,ne
       y=(i-es)/(ee-es)
       tt(i)=tt(ns)+(tt(ne)-tt(ns))*(y*(2-y))
       write(*,1000)i,tt(i)
7      continue
        ns=81
        es=81.
        ne=86
         ee=86.
       do 8,i=ns,ne
       tt(i)=tt(ne)+(tt(ns)-tt(ne))*(1-((i-es)/(ee-es))**2)
       write(*,1000)i,tt(i)
8      continue
        ns=86
        es=86.
        ne=106
         ee=106.
       do 9,i=ns,ne
       tt(i)=tt(ne)+(tt(ns)-tt(ne))*(1-((i-es)/(ee-es))**2)
       write(*,1000)i,tt(i)
9      continue
       ns=111
        es=111.
        ne=121
         ee=121.
       do 10,i=ns,ne
       tt(i)=tt(ne)+(tt(ns)-tt(ne))*(1-((i-es)/(ee-es))**2)
       write(*,1000)i,tt(i)
10      continue
       ns=131
```

```
      es=131.
      ne=141
       ee=141.
     do 11,i=ns,ne
     tt(i)=tt(ne)+(tt(ns)-tt(ne))*(1-((i-es)/(ee-es))**2)
     write(*,1000)i,tt(i)
11    continue
      ns=121
      ne=130
      nu=10
      nd=10
     do 12,i=ns,ne
     tt(i)=tt(i-nd)+.5*(tt(i+nu)-tt(i-nd))
     write(*,1000)i,tt(i)
12    continue
     ns=106
     ne=108
     do 13,i=ns,ne
     write(*,1000)i,tt(i)
13    continue
     stop
      end
```

## ANSYS INPUT FILE SUPPORTING RESULTS IN TABLE 3.4.8 of TSAR

```
/BATCH
/COM,ANSYS RELEASE 5.4   UP010997      10:52:43   08/17/2000
/input,menust,tmp   ,,,,,,,,,,,,,,,,,1
/PREP7
/TITLE MPC - Pressure and Temperature
!*
ET,1,PLANE42

!*
KEYOPT,1,1,0
KEYOPT,1,2,0
KEYOPT,1,3,1
KEYOPT,1,5,2
KEYOPT,1,6,4


!*
ET,2,SHELL51
!*
KEYOPT,2,3,0
KEYOPT,2,4,1
!*
! set parameters for geometry
rs=68.375/2
ts=0.5
lmpc=190.5
hf=9.5
lc=178.5
tbp=2.5
rl=33.625
bl=12
rmean=rs-.5*ts
l1=lmpc-2*bl-tbp
l2=hf-bl-l1
l3=l2-bl-tbp

denax=7.51e-04        ! Mass density of alloy x, lbf-sec^2/in^4
nuax=0.30             ! Poisson's ratio of alloy x

! material property tables
*dim,Eax,,16,2        ! Young's modulus of alloy x
Eax(1,1)=-40
Eax(1,2)=28.14e+06    ! Note: First column contains temperature data, F
Eax(2,1)=100          !
Eax(2,2)=28.14e+06    !     Second column contains corresponding data
Eax(3,1)=150          !     for Young's modulus, psi
Eax(3,2)=27.87e+06
Eax(4,1)=200
Eax(4,2)=27.60e+06
Eax(5,1)=250
Eax(5,2)=27.30e+06
Eax(6,1)=300
```

```
Eax(6,2)=27.00e+06
Eax(7,1)=350
Eax(7,2)=26.75e+06
Eax(8,1)=400
Eax(8,2)=26.50e+06
Eax(9,1)=450
Eax(9,2)=26.15e+06
Eax(10,1)=500
Eax(10,2)=25.80e+06
Eax(11,1)=550
Eax(11,2)=25.55e+06
Eax(12,1)=600
Eax(12,2)=25.30e+06
Eax(13,1)=650
Eax(13,2)=25.05e+06
Eax(14,1)=700
Eax(14,2)=24.80e+06
Eax(15,1)=750
Eax(15,2)=24.45e+06
Eax(16,1)=800
Eax(16,2)=24.10e+06

*dim,alax,,16,2        ! Coefficient of thermal expansion of alloy x (max)
alax(1,1)=-40
alax(1,2)=8.55e-06     ! Note: First column contains temperature data, F
alax(2,1)=100          !
alax(2,2)=8.55e-06     !     Second column contains corresponding data
alax(3,1)=150          !     for coeff. of thermal expansion, in/(in-F)
alax(3,2)=8.67e-06
alax(4,1)=200
alax(4,2)=8.79e-06
alax(5,1)=250
alax(5,2)=8.90e-06
alax(6,1)=300
alax(6,2)=9.00e-06
alax(7,1)=350
alax(7,2)=9.11e-06
alax(8,1)=400
alax(8,2)=9.21e-06
alax(9,1)=450
alax(9,2)=9.32e-06
alax(10,1)=500
alax(10,2)=9.42e-06
alax(11,1)=550
alax(11,2)=9.50e-06
alax(12,1)=600
alax(12,2)=9.60e-06
alax(13,1)=650
alax(13,2)=9.69e-06
alax(14,1)=700
alax(14,2)=9.76e-06
alax(15,1)=750
alax(15,2)=9.81e-06
alax(16,1)=800
alax(16,2)=9.90e-06
```

```
! Young's modulus

mptemp
mptemp,1,Eax(1,1),Eax(2,1),Eax(3,1),Eax(4,1),Eax(5,1),Eax(6,1)
mptemp,7,Eax(7,1),Eax(8,1),Eax(9,1),Eax(10,1),Eax(11,1),Eax(12,1)
mptemp,13,Eax(13,1),Eax(14,1),Eax(15,1),Eax(16,1)

*do,i,1,1,1
 mpdata,ex,i,1,Eax(1,2),Eax(2,2),Eax(3,2),Eax(4,2),Eax(5,2),Eax(6,2)
 mpdata,ex,i,7,Eax(7,2),Eax(8,2),Eax(9,2),Eax(10,2),Eax(11,2),Eax(12,2)
 mpdata,ex,i,13,Eax(13,2),Eax(14,2),Eax(15,2),Eax(16,2)
*enddo

! Shear modulus

! Values are calculated using Young's modulus (Eax) and Poisson's
! ratio (nuax) at each temperature for which data is available.
!
! G = E/(2*(1+nu))

mptemp
mptemp,1,Eax(1,1),Eax(2,1),Eax(3,1),Eax(4,1),Eax(5,1),Eax(6,1)
mptemp,7,Eax(7,1),Eax(8,1),Eax(9,1),Eax(10,1),Eax(11,1),Eax(12,1)
mptemp,13,Eax(13,1),Eax(14,1),Eax(15,1),Eax(16,1)

*do,i,1,1,1
 mpdata,gxy,i,1,Eax(1,2)/(2*(1+nuax)),Eax(2,2)/(2*(1+nuax))
 mpdata,gxy,i,3,Eax(3,2)/(2*(1+nuax)),Eax(4,2)/(2*(1+nuax))
 mpdata,gxy,i,5,Eax(5,2)/(2*(1+nuax)),Eax(6,2)/(2*(1+nuax))
 mpdata,gxy,i,7,Eax(7,2)/(2*(1+nuax)),Eax(8,2)/(2*(1+nuax))
 mpdata,gxy,i,9,Eax(9,2)/(2*(1+nuax)),Eax(10,2)/(2*(1+nuax))
 mpdata,gxy,i,11,Eax(11,2)/(2*(1+nuax)),Eax(12,2)/(2*(1+nuax))
 mpdata,gxy,i,13,Eax(13,2)/(2*(1+nuax)),Eax(14,2)/(2*(1+nuax))
 mpdata,gxy,i,15,Eax(15,2)/(2*(1+nuax)),Eax(16,2)/(2*(1+nuax))
*enddo

! Coefficient of thermal expansion

!mptemp
!mptemp,1,alax(1,1),alax(2,1),alax(3,1),alax(4,1),alax(5,1),alax(6,1)
!mptemp,7,alax(7,1),alax(8,1),alax(9,1),alax(10,1),alax(11,1),alax(12,1)
!mptemp,13,alax(13,1),alax(14,1),alax(15,1),alax(16,1)

!*do,i,1,1,1
 ! mpdata,alpx,i,1,alax(1,2),alax(2,2),alax(3,2),alax(4,2),alax(5,2),alax(6,2)
 ! mpdata,alpx,i,7,alax(7,2),alax(8,2),alax(9,2),alax(10,2),alax(11,2),alax(12,2)
 ! mpdata,alpx,i,13,alax(13,2),alax(14,2),alax(15,2),alax(16,2)
!*enddo
alpx,1,0.
! Poisson's ratio

*do,i,1,1,1
 mp,nuxy,i,nuax
*enddo

! Mass density
```

```
mp,dens,1,0.

!nodes
! node 1 is origin of x-y system (x is radial)
!save
n,1
n,11,rl
fill,1,11
ngen,5,11,1,11,1,0,hf/4

n,56,rmean,hf

n,76,rmean,(hf-bl)
fill,56,76


n,86,rmean,hf-bl-l1
fill,76,86

n,106,rmean,l2-bl
fill,86,106
n,108,rmean,l2-bl-tbp
fill,106,108

! nodes for baseplate

n,111,0,l3

n,120,(rs*0.9)
n,120,.9*rs,l3
fill,111,120
ngen,3,10,111,120,1,0,tbp/2

!apply boundary conditions

d,1,ux,0,0,45,11,
d,111,ux,0,0,131,10
d,all,uz,0
d,1,uy
save
! generate elements
!shell thickness
r,1,ts
! top lid
type,1
mat,1
real,1
save
e,1,2,13,12
egen,10,1,1,1,1
save
egen,4,11,1,10,1
save
! weld element
e,44,57,56,55
```

```
!shell elements in upper bending boundary layer
type,2
e,56,57
elist,all
save
egen,20,1,42,42,1
save


eplot

e,76,77
elist,all
!save
egen,10,1,62,62,1
!save
e,86,87
!save


egen,20,1,72,72,1

!generate baseplate elements
type,1
e,111,112,122,121
egen,9,1,92,92,1
egen,2,10,92,100,1

e,120,108,107,130
e,130,107,106,140
type,2
e,106,107
e,107,108
save
! element generation, node generation, bc complete
! loads are applied by picking - lot's of false attempts
save
!*
ANTYPE,0
NLGEOM,0
NROPT,AUTO, ,
LUMPM,0
EQSLV,FRONT,1e-008,0,
SSTIF
PSTRES
TOFFST,0,
!*
tref=70
NPLOT
EPLOT
/ZOOM,1,RECT,-0.277524,0.947283,0.255218,0.760870
tunif=70
! load case 1 internal pressure 100 psi
! properties are temp. independent since all materials the same
SFCUM,PRES,REPL,1,1,
```

```
SFCUM,CONV,REPL,1,1,
SFCUM,HFLUX,REPL,1,
SFCUM,SELV,REPL,1,1,
SFCUM,IMPD,REPL,1,1,
SFCUM,CHRGS,REPL,1,
!*
SFCUM,PRES,REPL,1,1,
SFCUM,CONV,REPL,1,1,
SFCUM,HFLUX,REPL,1,
SFCUM,SELV,REPL,1,1,
SFCUM,IMPD,REPL,1,1,
SFCUM,CHRGS,REPL,1,
!*
FLST,2,113,2,ORDE,2
FITEM,2,1
FITEM,2,-113
save
FLST,2,113,2,ORDE,2
FITEM,2,1
FITEM,2,-113
SFE,P51X,1,PRES, ,100, , , ,
FLST,2,10,2,ORDE,2
FITEM,2,1
FITEM,2,-10
resume

FLST,2,138,1,ORDE,4
FITEM,2,1
FITEM,2,-108
FITEM,2,111
FITEM,2,-140
SF,P51X,PRES,100,
FLST,2,138,1,ORDE,4
FITEM,2,1
FITEM,2,-108
FITEM,2,111
FITEM,2,-140
SF,P51X,PRES,100,
FLST,2,138,1,ORDE,4
FITEM,2,1
FITEM,2,-108
FITEM,2,111
FITEM,2,-140
SF,P51X,PRES,100,
FLST,2,138,1,ORDE,4
FITEM,2,1
FITEM,2,-108
FITEM,2,111
FITEM,2,-140
SF,P51X,PRES,100,
FLST,2,14,1,ORDE,5
FITEM,2,1
FITEM,2,-11
FITEM,2,22
FITEM,2,33
FITEM,2,44
```

```
epdele,all

resume

FLST,2,113,2,ORDE,2
FITEM,2,1
FITEM,2,-113
SFE,P51X,1,PRES, ,100, , , ,
FLST,2,10,2,ORDE,2
FITEM,2,1
FITEM,2,-10

resume
FLST,2,138,1,ORDE,4
FITEM,2,1
FITEM,2,-108
FITEM,2,111
FITEM,2,-140
SF,P51X,PRES,100,
FLST,2,11,1,ORDE,2
FITEM,2,1
FITEM,2,-11

resume
FLST,2,113,2,ORDE,2
FITEM,2,1
FITEM,2,-113
SFE,P51X,1,PRES, ,100, , , ,
FLST,2,113,2,ORDE,2
FITEM,2,1
FITEM,2,-113
SFE,P51X,1,PRES, ,100, , , ,
FLST,2,1,2,ORDE,1
FITEM,2,5
SFE,P51X,1,PRES, ,100, , , ,

resume
FLST,2,14,1,ORDE,5
FITEM,2,1
FITEM,2,-11
FITEM,2,22
FITEM,2,33
FITEM,2,44
SF,P51X,PRES,100,

save
/ZOOM, 1 ,BACK
/ZOOM,1,SCRN,0.635748,0.034239,0.689022,-0.182609
/ZOOM,1,RECT,0.042121,0.700000,0.091590,-0.829348

nplot,1
/ZOOM, 1 ,BACK
/ZOOM, 1, 33.543  , 4.6914  , .00000  , 6.0520
FLST,2,18,1,ORDE,2
FITEM,2,57
```

```
FITEM,2,-74
SF,P51X,PRES,100,

resume

resume
FLST,2,5,1,ORDE,4
FITEM,2,39
FITEM,2,-40
FITEM,2,49
FITEM,2,-51
SF,P51X,PRES,-100,
resume
eplot
/ZOOM,1,RECT,0.631942,0.186413,0.669995,-0.505978
nplot,1
/ZOOM,1,RECT,-0.018764,0.973913,0.430261,1.034783
/ZOOM, 1 ,BACK
/ZOOM, 1, 33.968  , -.72351  , .00000  , 9.6620
/ZOOM,1,RECT,-0.030180,1.015761,0.083979,-0.213043
FLST,2,20,1,ORDE,2
FITEM,2,57
FITEM,2,-76
SF,P51X,PRES,-100,

save
/ZOOM, 1 ,BACK
/ZOOM, 1, 33.968  , -.72351  , .00000  , 9.6620
/ZOOM, 1 ,BACK
/ZOOM, 1, 15.800  , 3.7359  , .00000  , 27.909
/ZOOM, 1 ,BACK
/VIEW, 1
/FOC, 1 ,AUTO
/DIST, 1
/ANG, 1
/LIG, 1 ,1
/REP
/ZOOM,1,RECT,0.148669,0.951087,0.220970,-0.935870
/ZOOM,1,RECT,-0.026374,0.875000,0.000263,-0.817935
FLST,2,10,1,ORDE,2
FITEM,2,76
FITEM,2,-85
SF,P51X,PRES,-100,

save
/ZOOM, 1 ,BACK
/ZOOM, 1, 36.333  , -84.953  , .00000  , 98.853
/ZOOM,1,RECT,-0.037790,-0.631522,0.026900,-0.992935
FLST,2,22,1,ORDE,2
FITEM,2,85
FITEM,2,-106
SF,P51X,PRES,-100,
/ZOOM, 1 ,BACK
/ZOOM, 1, 36.333  , -84.953  , .00000  , 98.853
/ZOOM,1,RECT,-0.391683,-0.905435,0.042121,-0.943478
FLST,2,11,1,ORDE,3
```

```
FITEM,2,106
FITEM,2,131
FITEM,2,-140
SF,P51X,PRES,100,
plist,all
! add pressure on weld
sfe,41,1,pres,,100

BF,  1 ,TEMP, 502.00
BF,  2 ,TEMP, 500.79
BF,  3 ,TEMP, 497.16
BF,  4 ,TEMP, 491.11
BF,  5 ,TEMP, 482.64
BF,  6 ,TEMP, 471.75
BF,  7 ,TEMP, 458.44
BF,  8 ,TEMP, 442.71
BF,  9 ,TEMP, 424.56
BF, 10 ,TEMP, 403.99
BF, 11 ,TEMP, 381.00
BF, 45 ,TEMP, 454.00
BF, 46 ,TEMP, 453.21
BF, 47 ,TEMP, 450.84
BF, 48 ,TEMP, 446.89
BF, 49 ,TEMP, 441.36
BF, 50 ,TEMP, 434.25
BF, 51 ,TEMP, 425.56
BF, 52 ,TEMP, 415.29
BF, 53 ,TEMP, 403.44
BF, 54 ,TEMP, 390.01
BF, 55 ,TEMP, 375.00
BF, 12 ,TEMP, 490.00
BF, 13 ,TEMP, 488.90
BF, 14 ,TEMP, 485.58
BF, 15 ,TEMP, 480.05
BF, 16 ,TEMP, 472.32
BF, 17 ,TEMP, 462.38
BF, 18 ,TEMP, 450.22
BF, 19 ,TEMP, 435.85
BF, 20 ,TEMP, 419.28
BF, 21 ,TEMP, 400.49
BF, 22 ,TEMP, 379.50
BF, 23 ,TEMP, 478.00
BF, 24 ,TEMP, 477.00
BF, 25 ,TEMP, 474.00
BF, 26 ,TEMP, 469.00
BF, 27 ,TEMP, 462.00
BF, 28 ,TEMP, 453.00
BF, 29 ,TEMP, 442.00
BF, 30 ,TEMP, 429.00
BF, 31 ,TEMP, 414.00
BF, 32 ,TEMP, 397.00
BF, 33 ,TEMP, 378.00
BF, 34 ,TEMP, 466.00
BF, 35 ,TEMP, 465.10
BF, 36 ,TEMP, 462.42
BF, 37 ,TEMP, 457.95
```

```
BF, 38 ,TEMP, 451.68
BF, 39 ,TEMP, 443.63
BF, 40 ,TEMP, 433.78
BF, 41 ,TEMP, 422.15
BF, 42 ,TEMP, 408.72
BF, 43 ,TEMP, 393.51
BF, 44 ,TEMP, 376.50
BF, 56 ,TEMP, 375.00
BF, 57 ,TEMP, 375.58
BF, 58 ,TEMP, 376.14
BF, 59 ,TEMP, 376.67
BF, 60 ,TEMP, 377.16
BF, 61 ,TEMP, 377.63
BF, 62 ,TEMP, 378.06
BF, 63 ,TEMP, 378.46
BF, 64 ,TEMP, 378.84
BF, 65 ,TEMP, 379.18
BF, 66 ,TEMP, 379.50
BF, 67 ,TEMP, 379.79
BF, 68 ,TEMP, 380.04
BF, 69 ,TEMP, 380.27
BF, 70 ,TEMP, 380.46
BF, 71 ,TEMP, 380.63
BF, 72 ,TEMP, 380.76
BF, 73 ,TEMP, 380.86
BF, 74 ,TEMP, 380.94
BF, 75 ,TEMP, 380.98
BF, 76 ,TEMP, 381.00
BF, 76 ,TEMP, 381.00
BF, 77 ,TEMP, 368.76
BF, 78 ,TEMP, 359.24
BF, 79 ,TEMP, 352.44
BF, 80 ,TEMP, 348.36
BF, 81 ,TEMP, 347.00
BF, 81 ,TEMP, 347.00
BF, 82 ,TEMP, 344.07
BF, 83 ,TEMP, 335.30
BF, 84 ,TEMP, 320.67
BF, 85 ,TEMP, 300.18
BF, 86 ,TEMP, 273.85
BF, 86 ,TEMP, 273.85
BF, 87 ,TEMP, 273.78
BF, 88 ,TEMP, 273.57
BF, 89 ,TEMP, 273.22
BF, 90 ,TEMP, 272.74
BF, 91 ,TEMP, 272.11
BF, 92 ,TEMP, 271.34
BF, 93 ,TEMP, 270.44
BF, 94 ,TEMP, 269.39
BF, 95 ,TEMP, 268.21
BF, 96 ,TEMP, 266.89
BF, 97 ,TEMP, 265.43
BF, 98 ,TEMP, 263.82
BF, 99 ,TEMP, 262.08
BF, 100 ,TEMP, 260.20
BF, 101 ,TEMP, 258.18
```

```
BF, 102 ,TEMP,  256.03
BF, 103 ,TEMP,  253.73
BF, 104 ,TEMP,  251.29
BF, 105 ,TEMP,  248.72
BF, 106 ,TEMP,  246.00
BF, 111 ,TEMP,  203.00
BF, 112 ,TEMP,  202.93
BF, 113 ,TEMP,  202.72
BF, 114 ,TEMP,  202.37
BF, 115 ,TEMP,  201.88
BF, 116 ,TEMP,  201.25
BF, 117 ,TEMP,  200.48
BF, 118 ,TEMP,  199.57
BF, 119 ,TEMP,  198.52
BF, 120 ,TEMP,  197.33
BF, 121 ,TEMP,  196.00
BF, 131 ,TEMP,  209.00
BF, 132 ,TEMP,  209.37
BF, 133 ,TEMP,  210.48
BF, 134 ,TEMP,  212.33
BF, 135 ,TEMP,  214.92
BF, 136 ,TEMP,  218.25
BF, 137 ,TEMP,  222.32
BF, 138 ,TEMP,  227.13
BF, 139 ,TEMP,  232.68
BF, 140 ,TEMP,  238.97
!BF, 141 ,TEMP,  246.00
BF, 121 ,TEMP,  206.00
BF, 122 ,TEMP,  206.15
BF, 123 ,TEMP,  206.60
BF, 124 ,TEMP,  207.35
BF, 125 ,TEMP,  208.40
BF, 126 ,TEMP,  209.75
BF, 127 ,TEMP,  211.40
BF, 128 ,TEMP,  213.35
BF, 129 ,TEMP,  215.60
BF, 130 ,TEMP,  218.15
BF, 106 ,TEMP,  246.00
BF, 107 ,TEMP,  221.00
BF, 108 ,TEMP,  196.00

SAVE
finish

!/eof

/solu
/output,result68
outpr,all,last
outres,all,last
solve
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

TABLE OF CONTENTS

INPUT FILES

**MPC-24E.INP**
**BC-0DEG.INP**
**DROP0.INP**
**SIDE0.INP**
**BC-45DEG.INP**
**DROP45.INP**
**SIDE45.INP**
**POST.INP**

**ARCHIVE FILE STORAGE OF ANSYS WORK IS IN \PROJECTS\5014\CBULLARD\MPC24E\HISTORM**

**THE HARD COPY OF THIS APPENDIX B IS STORED IN \PROJECTS\5014\HISTORM\AIS\HI2002481\REV0**

RESULTS


TABLE 1 0 DEGREE SIDE DROP – FUEL BASKET – PRIMARY MEMBRANE

TABLE 2 0 DEGREE SIDE DROP – FUEL BASKET – LOCAL MEMBRANE PLUS PRIMARY BENDING

TABLE 3 0 DEGREE SIDE DROP – ENCLOSURE VESSEL – PRIMARY MEMBRANE

TABLE 4 0 DEGREE SIDE DROP – ENCLOSURE VESSEL – LOCAL MEMBRANE PLUS PRIMARY BENDING

TABLE 5 45 DEGREE SIDE DROP – FUEL BASKET – PRIMARY MEMBRANE

TABLE 6 45 DEGREE SIDE DROP – FUEL BASKET – LOCAL MEMBRANE PLUS PRIMARY BENDING

TABLE 7 45 DEGREE SIDE DROP – ENCLOSURE VESSEL – PRIMARY MEMBRANE

TABLE 8 45 DEGREE SIDE DROP – ENCLOSURE VESSEL – LOCAL MEMBRANE PLUS PRIMARY BENDING

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

**MPC-24E.INP**

```
! \\projects\5014\cbullard\mpc-24e\hi-storm\side0\closed\mpc-24e.inp
!
! The following ANSYS input file is used to generate 2-D strucutral models
! of the HI-STORM 100 MPCs.  The input file is parametric and can be used to
! create MPC baskets of various sizes (i.e., MPC-32,MPC-68).  The number of
! elements is controlled by a series of input parameters.
!
! No loads or boundary conditions are defined in this input file.  Separate
! input files are used to apply loads and boundary conditions.
!
! The element types, material property sets, and real constant sets related
! to the canister shell/overpack contact elements (CONTAC26) are defined in
! this file, but they are not used.  This information is intended for later
! use in the "load case" input files.
!
! The following data are for the MPC-24E.

/output,mpc-24e,lst

fini
/clear

/filnam,mpc-24e
/title,MPC-24E Structural Model
/unit,bin

pi=acos(-1)

*afun,deg            ! Change units for angular functions

!**************   Input data   ****************************************

! Geometric data

nbx=24                   ! Number of boxes
nrw=6                    ! Number of rows

*dim,row,,nrw            ! Number of boxes in each row
row(1)=2
row(2)=4
row(3)=6
row(4)=6
row(5)=4
row(6)=2

fblt=176.5           ! Axial length of fuel basket, in
cslt=187.5           ! Axial length of canister shell, in

axlt=1.0                 ! Axial length of model, in

cp=10.847                ! Cell pitch, in
bxid=8.75            ! Inner dimension of box, in
bxid2=9.05           ! Inner dimension of 4 corner boxes, in
bwtk=0.3125          ! Thickness of box walls, in
bwtk2=0.3125         ! Thickness of center walls, in
angtk=0.3125         ! Thickness of angles, in
cptk=0.3125          ! Thickness of connecting plates, in
cstk=0.5                 ! Thickness of canister shell, in
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

```
bstk=0.3125          ! Thickness of basket supports, in
csrd=33.9375             ! Mean radius of canister shell, in
shim=0.5525          ! Thickness of MPC shell shims, in
oprd=34.75-cstk/2-shim     ! Inner radius of overpack, in
gap=0.01             ! Basket/shell gap, in
weld=0.125           ! Size of basket welds, in

offset=0.75          ! Offset length of flux traps (8 locations), in

shearz=6/5               ! Shear deflection constant

kn=1.0e+06               ! Normal contact stiffness (basket/shell)
stifn=1.0e+06        ! Normal contact stiffness (shell/overpack)

! Material data

denax=7.51e-04           ! Mass density of alloy x, lbf-sec^2/in^4
nuax=0.30                ! Poisson's ratio of alloy x

cof=0.0                     ! Coeffficient of friction (basket/shell)

*dim,Eax,,16,2           ! Young's modulus of alloy x
Eax(1,1)=-40
Eax(1,2)=28.14e+06       ! Note: First column contains temperature data, F
Eax(2,1)=100         !
Eax(2,2)=28.14e+06       !       Second column contains corresponding data
Eax(3,1)=150             !       for Young's modulus, psi
Eax(3,2)=27.87e+06
Eax(4,1)=200
Eax(4,2)=27.60e+06
Eax(5,1)=250
Eax(5,2)=27.30e+06
Eax(6,1)=300
Eax(6,2)=27.00e+06
Eax(7,1)=350
Eax(7,2)=26.75e+06
Eax(8,1)=400
Eax(8,2)=26.50e+06
Eax(9,1)=450
Eax(9,2)=26.15e+06
Eax(10,1)=500
Eax(10,2)=25.80e+06
Eax(11,1)=550
Eax(11,2)=25.55e+06
Eax(12,1)=600
Eax(12,2)=25.30e+06
Eax(13,1)=650
Eax(13,2)=25.05e+06
Eax(14,1)=700
Eax(14,2)=24.80e+06
Eax(15,1)=750
Eax(15,2)=24.45e+06
Eax(16,1)=800
Eax(16,2)=24.10e+06

*dim,alax,,16,2          ! Coefficient of thermal expansion of alloy x (max)
alax(1,1)=-40
alax(1,2)=8.55e-06       ! Note: First column contains temperature data, F
alax(2,1)=100            !
alax(2,2)=8.55e-06       !       Second column contains corresponding data
```

```
alax(3,1)=150            !       for coeff. of thermal expansion, in/(in-F)
alax(3,2)=8.67e-06
alax(4,1)=200
alax(4,2)=8.79e-06
alax(5,1)=250
alax(5,2)=8.90e-06
alax(6,1)=300
alax(6,2)=9.00e-06
alax(7,1)=350
alax(7,2)=9.11e-06
alax(8,1)=400
alax(8,2)=9.21e-06
alax(9,1)=450
alax(9,2)=9.32e-06
alax(10,1)=500
alax(10,2)=9.42e-06
alax(11,1)=550
alax(11,2)=9.50e-06
alax(12,1)=600
alax(12,2)=9.60e-06
alax(13,1)=650
alax(13,2)=9.69e-06
alax(14,1)=700
alax(14,2)=9.76e-06
alax(15,1)=750
alax(15,2)=9.81e-06
alax(16,1)=800
alax(16,2)=9.90e-06

! Load data

g=386.4                     ! Acceleration due to gravity, in/sec^2

fawt=1680            ! Weight of PWR fuel assembly, lbf
falt=168             ! Length of basket support structure, in

bpwt=8.5             ! Weight of Boral panel (@ 2.66 g/c), lbf
bplt=156             ! Length of Boral panel, in

shwt=21.0            ! Weight of sheathing panel, lbf
shlt=156.5           ! Length of sheathing panel, in

lidwt=9822           ! Weight of MPC closure lid, lbf

! Finite element data

tol=0.01             ! Tolerance used for node selection, in

nelbw=6                 ! Number of elements per box wall
ltweld=bwtk/2+weld/3! Length of beam elements adjacent to welds, in
ltcpel=2.0           ! Maximum length of connecting plates, in
ltcsel=3.0              ! Maximum length of canister shell elements, deg
ltbsel=2.0              ! Maximum length of basket support elements, in

!**************   Error checking   ***********************************

total=row(1)
*do,i,2,nrw,1
  total=total+row(i)
*enddo
```

```
*if,nbx,ne,total,then
  *msg,error,nbx,total
  NBX (= %I) DOES NOT EQUAL THE SUM OF THE ELEMENTS IN ROW (= %I).
  *go,:end
*endif

*do,i,1,nrw/2,1
  *if,row(i),ne,row(nrw-i+1),then
    *msg,error
    BASKET STRUCTURE IS NOT SYMMETRIC ABOUT THE X AXIS.
    *go,:end
  *endif
*enddo

*if,oprd,lt,csrd,then
  *msg,error,oprd,csrd
  OPRD (= %G) IS LESS THAN CSRD (= %G).
  *go,:end
*endif

!**************   User defined macros    ******************************

*create,ceil,mac            ! This function returns the next integer
  ans=nint(arg1)            ! which is greater than the input value.
  *if,ans,lt,arg1,then            !
    ans=ans+1               ! Example:   ceil,1.3  ->   ans=2
  *endif
*end

!**************   Define element types   ******************************

/prep7

! Type 1 - fuel basket
! Type 2 - connecting plates
! Type 3 - canister shell
! Type 4 - basket supports (plate type)
! Type 5 - basket supports (solid type)
! Type 6 - basket/shell contact
! Type 7 - shell/overpack contact
! Type 8 - 2-D linear spring
! Type 9 - box walls (-y)
! Type 10 - box walls (+x)
! Type 11 - rigid beams

et,1,beam3
et,2,beam3
et,3,beam3
et,4,beam3

et,5,plane82,,,3

et,6,contac12
et,7,contac26

et,8,combin14,,,2

et,9,beam3
et,10,beam3
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

```
!et,11,beam3

!**************   Define material properties   **********************

! Material 1 - box walls (egg crate)
! Material 2 - box walls (angle)
! Material 3 - center walls
! Material 4 - flux trap walls
! Material 5 - connecting plates
! Material 6 - canister shell
! Material 7 - basket supports (plate type)
! Material 8 - basket supports (solid type)
! Material 9 - basket/shell contact

tref,70              ! Reference temperature for thermal strain calculations

! Young's modulus

mptemp
mptemp,1,Eax(1,1),Eax(2,1),Eax(3,1),Eax(4,1),Eax(5,1),Eax(6,1)
mptemp,7,Eax(7,1),Eax(8,1),Eax(9,1),Eax(10,1),Eax(11,1),Eax(12,1)
mptemp,13,Eax(13,1),Eax(14,1),Eax(15,1),Eax(16,1)

*do,i,1,8,1
  mpdata,ex,i,1,Eax(1,2),Eax(2,2),Eax(3,2),Eax(4,2),Eax(5,2),Eax(6,2)
  mpdata,ex,i,7,Eax(7,2),Eax(8,2),Eax(9,2),Eax(10,2),Eax(11,2),Eax(12,2)
  mpdata,ex,i,13,Eax(13,2),Eax(14,2),Eax(15,2),Eax(16,2)
*enddo

! Shear modulus

! Values are calculated using Young's modulus (Eax) and Poisson's
! ratio (nuax) at each temperature for which data is available.
!
! G = E/(2*(1+nu))

mptemp
mptemp,1,Eax(1,1),Eax(2,1),Eax(3,1),Eax(4,1),Eax(5,1),Eax(6,1)
mptemp,7,Eax(7,1),Eax(8,1),Eax(9,1),Eax(10,1),Eax(11,1),Eax(12,1)
mptemp,13,Eax(13,1),Eax(14,1),Eax(15,1),Eax(16,1)

*do,i,1,8,1
  mpdata,gxy,i,1,Eax(1,2)/(2*(1+nuax)),Eax(2,2)/(2*(1+nuax))
  mpdata,gxy,i,3,Eax(3,2)/(2*(1+nuax)),Eax(4,2)/(2*(1+nuax))
  mpdata,gxy,i,5,Eax(5,2)/(2*(1+nuax)),Eax(6,2)/(2*(1+nuax))
  mpdata,gxy,i,7,Eax(7,2)/(2*(1+nuax)),Eax(8,2)/(2*(1+nuax))
  mpdata,gxy,i,9,Eax(9,2)/(2*(1+nuax)),Eax(10,2)/(2*(1+nuax))
  mpdata,gxy,i,11,Eax(11,2)/(2*(1+nuax)),Eax(12,2)/(2*(1+nuax))
  mpdata,gxy,i,13,Eax(13,2)/(2*(1+nuax)),Eax(14,2)/(2*(1+nuax))
  mpdata,gxy,i,15,Eax(15,2)/(2*(1+nuax)),Eax(16,2)/(2*(1+nuax))
*enddo

! Coefficient of thermal expansion

mptemp
mptemp,1,alax(1,1),alax(2,1),alax(3,1),alax(4,1),alax(5,1),alax(6,1)
mptemp,7,alax(7,1),alax(8,1),alax(9,1),alax(10,1),alax(11,1),alax(12,1)
mptemp,13,alax(13,1),alax(14,1),alax(15,1),alax(16,1)

*do,i,1,8,1
```

```
  mpdata,alpx,i,1,alax(1,2),alax(2,2),alax(3,2),alax(4,2),alax(5,2),alax(6,2)
  mpdata,alpx,i,7,alax(7,2),alax(8,2),alax(9,2),alax(10,2),alax(11,2),alax(12,2)
  mpdata,alpx,i,13,alax(13,2),alax(14,2),alax(15,2),alax(16,2)
*enddo

! Poisson's ratio

*do,i,1,8,1
  mp,nuxy,i,nuax
*enddo

! Mass density

bwvol=(bxid+bwtk/2+angtk/2)*bwtk*axlt          ! Volume of one box wall, in^3
bwvol2=(bxid+bwtk/2+angtk/2)*bwtk2*axlt
angvol=(bxid+bwtk/2+angtk/2)*angtk*axlt        ! Volume of one angle wall, in^3

bpdens1=bpwt/(g*bplt*bwvol)        ! Eff. density of Boral, lbf-sec^2/in^4
shdens1=shwt/(g*shlt*bwvol)        ! Eff. density of sheating, lbf-sec^2/in^4

bpdens2=bpwt/(g*bplt*angvol)
shdens2=shwt/(g*shlt*angvol)

bpdens3=bpwt/(g*bplt*bwvol2)
shdens3=shwt/(g*shlt*bwvol2)

mp,dens,1,denax+bpdens1+shdens1
mp,dens,2,denax+bpdens2+shdens2
mp,dens,3,denax+bpdens3+shdens3

*do,i,4,8,1
  mp,dens,i,denax
*enddo

! Coefficient of friction
mp,mu,9,cof

!**************   Define real constants   ****************************

! Real constant 1 - box wall (egg crate) elements
! Real constant 2 - box wall (angle) elements
! Real constant 3 - center walls
! Real constant 4 - canister shell elements
! Real constant 5 - basket support elements (plate type)
! Real constant 6 - basket support elements (solid type)
! Real constant 7 - basket/shell contact elements (x dir., +x)
! Real constant 8 - basket/shell contact elements (y dir., +y)
! Real constant 9 - basket/shell contact elements (x dir., -x)
! Real constant 10 - basket/shell contact elements (y dir., -y)
! Real constant 11 - 2-D linear spring connecting basket to shell
! Real constant 12 - shell/overpack contact elements
! Real constant 13 - 2-D linear spring connecting shell to overpack
! Real constant 14 - rigid beams

r,1,bwtk*axlt,(axlt*bwtk**3)/12,bwtk,shearz      ! Area, inertia, height, shearz
r,2,angtk*axlt,(axlt*angtk**3)/12,angtk,shearz
r,3,bwtk2*axlt,(axlt*bwtk2**3)/12,bwtk2,shearz
r,4,cstk*axlt,(axlt*cstk**3)/12,cstk,shearz
r,5,bstk*axlt,(axlt*bstk**3)/12,bstk,shearz
```

```
r,6,axlt              ! Plate thickness

r,7,270,kn,-gap             ! Interface angle, normal contact stiffness, initial gap
r,8,0,kn,-gap
r,9,270,kn,-gap
r,10,0,kn,-gap

r,11,kn                     ! Normal contact stiffness

r,12,stifn,oprd,0    ! Normal contact stiffness, radius, acute arc

r,13,stifn           ! Normal contact stiffness

!r,14,1000*bwtk*axlt,1000*(axlt*bwtk**3)/12,bwtk,shearz

!**************   Construct finite element model   *******************

!**************   Fuel basket   ***************************************

csys,0               ! Cartesian coordinates

! Define local coordinate system at the center of box #1

ft=cp-bxid-bwtk-angtk              ! Flux trap dimension

local,11,0,ft/2+bwtk+bxid/2,ft/2+bwtk+bxid/2

! Define nodes for box #1

avglt=(bxid+bwtk/2+angtk/2)/nelbw ! Average length of box wall elements
ceil,(cp-bxid-bwtk/2-angtk/2-2*ltweld)/avglt
nelft=ans+2

ninc=6*(nelbw+1)+4*nelft   ! Node number increment between consecutive boxes

n,1,-(bxid+bwtk)/2,-(bxid+bwtk)/2
n,2,-(bxid+bwtk)/2+ltweld,-(bxid+bwtk)/2
n,nelbw,(bxid+angtk)/2-ltweld,-(bxid+bwtk)/2
n,nelbw+1,(bxid+angtk)/2,-(bxid+bwtk)/2
n,nelbw+2,(bxid+angtk)/2+ltweld,-(bxid+bwtk)/2
*if,nelft,gt,2,then
  n,nelbw+nelft,cp-(bxid+bwtk)/2-ltweld,-(bxid+bwtk)/2
*endif
n,nelbw+nelft+1,cp-(bxid+bwtk)/2,-(bxid+bwtk)/2

n,nelbw+nelft+2,cp-(bxid+bwtk)/2,cp-(bxid+bwtk)/2
n,nelbw+nelft+3,cp-(bxid+bwtk)/2-ltweld,cp-(bxid+bwtk)/2
n,2*nelbw+nelft+1,-bxid/2+ft+angtk/2+ltweld,cp-(bxid+bwtk)/2
n,2*nelbw+nelft+2,-bxid/2+ft+angtk/2,cp-(bxid+bwtk)/2
n,2*nelbw+nelft+3,-bxid/2+ft+angtk/2-ltweld,cp-(bxid+bwtk)/2
*if,nelft,gt,2,then
  n,2*(nelbw+nelft)+1,-(bxid+bwtk)/2+ltweld,cp-(bxid+bwtk)/2
*endif
n,2*(nelbw+nelft+1),-(bxid+bwtk)/2,cp-(bxid+bwtk)/2

n,2*(nelbw+nelft)+3,-(bxid+bwtk)/2,-(bxid+bwtk)/2
n,2*(nelbw+nelft+2),-(bxid+bwtk)/2,-(bxid+bwtk)/2+ltweld
n,3*nelbw+2*nelft+2,-(bxid+bwtk)/2,(bxid+angtk)/2-ltweld
n,3*nelbw+2*nelft+3,-(bxid+bwtk)/2,(bxid+angtk)/2
n,3*nelbw+2*nelft+4,-(bxid+bwtk)/2,(bxid+angtk)/2+ltweld
```

```
*if,nelft,gt,2,then
  n,3*(nelbw+nelft)+2,-(bxid+bwtk)/2,cp-(bxid+bwtk)/2-ltweld
*endif
n,3*(nelbw+nelft+1),-(bxid+bwtk)/2,cp-(bxid+bwtk)/2

n,3*(nelbw+nelft)+4,cp-(bxid+bwtk)/2,cp-(bxid+bwtk)/2
n,3*(nelbw+nelft)+5,cp-(bxid+bwtk)/2,cp-(bxid+bwtk)/2-ltweld
n,4*nelbw+3*nelft+3,cp-(bxid+bwtk)/2,-bxid/2+ft+angtk/2+ltweld
n,4*nelbw+3*nelft+4,cp-(bxid+bwtk)/2,-bxid/2+ft+angtk/2
n,4*nelbw+3*nelft+5,cp-(bxid+bwtk)/2,-bxid/2+ft+angtk/2-ltweld
*if,nelft,gt,2,then
  n,4*(nelbw+nelft)+3,cp-(bxid+bwtk)/2,-(bxid+bwtk)/2+ltweld
*endif
n,4*(nelbw+nelft+1),cp-(bxid+bwtk)/2,-(bxid+bwtk)/2

n,4*(nelbw+nelft)+5,-(bxid+bwtk)/2,(bxid+angtk)/2
n,4*(nelbw+nelft)+6,-(bxid+bwtk)/2+ltweld,(bxid+angtk)/2
n,5*nelbw+4*nelft+5,(bxid+angtk)/2,(bxid+angtk)/2
n,5*nelbw+4*nelft+6,(bxid+angtk)/2,-(bxid+bwtk)/2
n,5*nelbw+4*nelft+7,(bxid+angtk)/2,-(bxid+bwtk)/2+ltweld
n,6*nelbw+4*nelft+6,(bxid+angtk)/2,(bxid+angtk)/2

fill,2,nelbw,,,,4,nelbw+nelft+1
*if,nelft,gt,3,then
  fill,nelbw+2,nelbw+nelft,,,,4,nelbw+nelft+1
*endif
fill,4*(nelbw+nelft)+6,5*nelbw+4*nelft+5,,,,2,nelbw+1

cm,box1,node

! Define local coordinate system at the center of box #2

local,12,0,ft/2+bwtk+bxid/2+cp,3*ft/2+bwtk+angtk+bxid/2,,-90

csys,11

transfer,12,ninc,box1

! Define local coordinate system at the center of box #3

local,13,0,ft/2+bwtk+bxid/2+2*cp,ft/2+bwtk+bxid/2

csys,11

transfer,13,2*ninc,box1

! Define local coordinate system at the center of box #4

local,14,0,3*ft/2+bwtk+angtk+bxid/2,ft/2+bwtk+bxid/2+cp,,90

csys,11

transfer,14,3*ninc,box1

! Define local coordinate system at the center of box #5

local,15,0,3*ft/2+bwtk+angtk+bxid/2+cp,3*ft/2+bwtk+angtk+bxid/2+cp,,180

csys,11
```

```
transfer,15,4*ninc,box1

! Define local coordinate system at the center of box #6

local,16,0,ft/2+bwtk+bxid/2,ft/2+bwtk+bxid/2+2*cp

csys,11

transfer,16,5*ninc,box1

csys,0

! Define elements for each box

type,1
mat,4
real,1

*do,i,1,4,1
  e,(i-1)*(nelbw+nelft)+i,(i-1)*(nelbw+nelft)+i+1
  egen,nelbw,1,-1
  e,(i-1)*(nelbw+nelft)+nelbw+i,(i-1)*(nelbw+nelft)+nelbw+i+1
  egen,nelft,1,-1
*enddo

*do,i,1,2,1
  e,(i+3)*nelbw+4*nelft+i-4,(i+3)*nelbw+4*nelft+i+5
  egen,nelbw,1,-1
*enddo

egen,6,ninc,-(6*nelbw+4*nelft)

! Modify box wall element material and real numbers

*do,i,1,6,1
  csys,10+i
  nsel,s,loc,x,-(bxid+bwtk)/2-tol,(bxid+angtk)/2+tol
  nsel,r,loc,y,-(bxid+bwtk)/2-tol,(bxid+angtk)/2+tol
  esln,s,1
  emodif,all,mat,1
  nsel,s,loc,x,(bxid+angtk)/2
  nsel,r,loc,y,-(bxid+bwtk)/2-tol,(bxid+angtk)/2+tol
  esln,s,1
  emodif,all,mat,2
  emodif,all,real,2
  nsel,s,loc,y,(bxid+angtk)/2
  nsel,r,loc,x,-(bxid+bwtk)/2-tol,(bxid+angtk)/2+tol
  esln,s,1
  emodif,all,mat,2
  emodif,all,real,2
*enddo

nsel,all
esel,all

csys,0              ! Cartesian coordinates

nsym,y,6*ninc,all

egen,2,6*ninc,all
```

```
nsym,x,12*ninc,all

egen,2,12*ninc,all

! Define nodes and elements that connect four quadrants

*get,mxnd,node,,num,max

n,mxnd+1,ft/2+bwtk/2,-ft/2-bwtk/2
n,mxnd+2,ft/2+bwtk/2,-ft/2-bwtk/2+ltweld
n,mxnd+3,ft/2+bwtk/2,ft/2+bwtk/2-ltweld
n,mxnd+4,ft/2+bwtk/2,ft/2+bwtk/2

ngen,3,4,mxnd+1,mxnd+4,,cp
ngen,2,4,mxnd+9,mxnd+12,,bxid+bwtk/2+angtk/2

nsym,x,16,mxnd+1,mxnd+16

csys,1

ngen,2,32,mxnd+1,mxnd+32,,,90

csys,0

!type,11
!mat,4
!real,14
!
!e,mxnd+1,mxnd+2
!e,mxnd+3,mxnd+4

type,1
mat,4
real,1

e,mxnd+1,mxnd+2
e,mxnd+2,mxnd+3
e,mxnd+3,mxnd+4

egen,16,4,-3

nsel,all
esel,all

nummrg,node              ! Merge coincident nodes and elements
nummrg,elem

! Delete nodes and elements that form peripheral flux traps

nsel,s,loc,x,-ft/2-bwtk-2*cp-bxid-angtk/2,ft/2+bwtk+2*cp+bxid+angtk/2
nsel,r,loc,y,-ft/2-bwtk-2*cp-bxid-angtk/2,ft/2+bwtk+2*cp+bxid+angtk/2
esln,s,1
esel,inve
nsel,inve
edele,all
ndele,all
nsel,all
esel,all
```

```
nsel,s,loc,y,-ft/2-bwtk/2-cp
nsel,r,loc,x,ft/2+bwtk/2+2*cp+tol,ft/2+bwtk+2*cp+bxid+angtk/2-tol

nd1=node(ft/2+bwtk+2*cp+bxid+angtk/2-offset,-ft/2-bwtk/2-cp,0)

nsel,s,loc,y,-ft/2-bwtk-bxid-angtk/2
nsel,r,loc,x,ft/2+bwtk/2+2*cp+tol,ft/2+bwtk+2*cp+bxid+angtk/2-tol

nd2=node(nx(nd1),-ft/2-bwtk-bxid-angtk/2,0)

nsel,s,node,,nd1
nsel,a,node,,nd2

nmodif,all,ft/2+bwtk+2*cp+bxid+angtk/2-offset

e,nd1,nd2

nsel,s,loc,y,-ft/2-bwtk/2-cp
nsel,r,loc,x,ft/2+bwtk+2*cp+bxid+angtk/2-offset+tol,ft/2+bwtk+2*cp+bxid+angtk/2

esln,s
edele,all
esel,all

nsel,all

nd3=node(ft/2+bwtk/2+2*cp+ltweld,-ft/2-bwtk-bxid-angtk/2,0)

nsel,s,node,,nd3,nd2
esln,s,1
edele,all

nsel,s,node,,nd3+1,nd2-1
ndele,all
nsel,all

fill,nd3,nd2

mat,2
real,2

e,nd3,nd3+1
egen,nd2-nd3,1,-1

nsel,s,loc,y,ft/2+bwtk/2+cp
nsel,r,loc,x,ft/2+bwtk/2+2*cp+tol,ft/2+bwtk+2*cp+bxid+angtk/2-tol

nd1=node(ft/2+bwtk+2*cp+bxid+angtk/2-offset,ft/2+bwtk/2+cp,0)

nsel,s,loc,y,ft/2+bwtk+bxid+angtk/2
nsel,r,loc,x,ft/2+bwtk/2+2*cp+tol,ft/2+bwtk+2*cp+bxid+angtk/2-tol

nd2=node(nx(nd1),ft/2+bwtk+bxid+angtk/2,0)

nsel,s,node,,nd1
nsel,a,node,,nd2

nmodif,all,ft/2+bwtk+2*cp+bxid+angtk/2-offset

mat,4
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

```
real,1

e,nd1,nd2

nsel,s,loc,y,ft/2+bwtk/2+cp
nsel,r,loc,x,ft/2+bwtk+2*cp+bxid+angtk/2-offset+tol,ft/2+bwtk+2*cp+bxid+angtk/2

esln,s
edele,all
esel,all

nsel,all

nd3=node(ft/2+bwtk/2+2*cp+ltweld,ft/2+bwtk+bxid+angtk/2,0)

nsel,s,node,,nd3,nd2
esln,s,1
edele,all

nsel,s,node,,nd3+1,nd2-1
ndele,all
nsel,all

fill,nd3,nd2

mat,2
real,2

e,nd3,nd3+1
egen,nd2-nd3,1,-1

nsel,s,loc,y,-ft/2-bwtk/2-cp
nsel,r,loc,x,-ft/2-bwtk-2*cp-bxid-angtk/2+tol,-ft/2-bwtk/2-2*cp-tol

nd1=node(-ft/2-bwtk-2*cp-bxid-angtk/2+offset,-ft/2-bwtk/2-cp,0)

nsel,s,loc,y,-ft/2-bwtk-bxid-angtk/2
nsel,r,loc,x,-ft/2-bwtk-2*cp-bxid-angtk/2+tol,-ft/2-bwtk/2-2*cp-tol

nd2=node(nx(nd1),-ft/2-bwtk-bxid-angtk/2,0)

nsel,s,node,,nd1
nsel,a,node,,nd2

nmodif,all,-ft/2-bwtk-2*cp-bxid-angtk/2+offset

mat,4
real,1

e,nd1,nd2

nsel,s,loc,y,-ft/2-bwtk/2-cp
nsel,r,loc,x,-ft/2-bwtk-2*cp-bxid-angtk/2,-ft/2-bwtk-2*cp-bxid-angtk/2+offset-tol

esln,s
edele,all
esel,all

nsel,all
```

```
nd3=node(-ft/2-bwtk/2-2*cp-ltweld,-ft/2-bwtk-bxid-angtk/2,0)

nsel,s,node,,nd3,nd2
esln,s,1
edele,all

nsel,s,node,,nd3+1,nd2-1
ndele,all
nsel,all

fill,nd3,nd2

mat,2
real,2

e,nd3,nd3+1
egen,nd2-nd3,1,-1

nsel,s,loc,y,ft/2+bwtk/2+cp
nsel,r,loc,x,-ft/2-bwtk-2*cp-bxid-angtk/2+tol,-ft/2-bwtk/2-2*cp-tol

nd1=node(-ft/2-bwtk-2*cp-bxid-angtk/2+offset,ft/2+bwtk/2+cp,0)

nsel,s,loc,y,ft/2+bwtk+bxid+angtk/2
nsel,r,loc,x,-ft/2-bwtk-2*cp-bxid-angtk/2+tol,-ft/2-bwtk/2-2*cp-tol

nd2=node(nx(nd1),ft/2+bwtk+bxid+angtk/2,0)

nsel,s,node,,nd1
nsel,a,node,,nd2

nmodif,all,-ft/2-bwtk-2*cp-bxid-angtk/2+offset

mat,4
real,1

e,nd1,nd2

nsel,s,loc,y,ft/2+bwtk/2+cp
nsel,r,loc,x,-ft/2-bwtk-2*cp-bxid-angtk/2,-ft/2-bwtk-2*cp-bxid-angtk/2+offset-tol

esln,s
edele,all
esel,all

nsel,all

nd3=node(-ft/2-bwtk/2-2*cp-ltweld,ft/2+bwtk+bxid+angtk/2,0)

nsel,s,node,,nd3,nd2
esln,s,1
edele,all

nsel,s,node,,nd3+1,nd2-1
ndele,all
nsel,all

fill,nd3,nd2

mat,2
```

```
real,2

e,nd3,nd3+1
egen,nd2-nd3,1,-1

nsel,s,loc,x,-ft/2-bwtk/2-cp
nsel,r,loc,y,ft/2+bwtk/2+2*cp+tol,ft/2+bwtk+2*cp+bxid+angtk/2-tol

nd1=node(-ft/2-bwtk/2-cp,ft/2+bwtk+2*cp+bxid+angtk/2-offset,0)

nsel,s,loc,x,-ft/2-bwtk-bxid-angtk/2
nsel,r,loc,y,ft/2+bwtk/2+2*cp+tol,ft/2+bwtk+2*cp+bxid+angtk/2-tol

nd2=node(-ft/2-bwtk-bxid-angtk/2,ny(nd1),0)

nsel,s,node,,nd1
nsel,a,node,,nd2

nmodif,all,,ft/2+bwtk+2*cp+bxid+angtk/2-offset

mat,4
real,1

e,nd1,nd2

nsel,s,loc,x,-ft/2-bwtk/2-cp
nsel,r,loc,y,ft/2+bwtk+2*cp+bxid+angtk/2-offset+tol,ft/2+bwtk+2*cp+bxid+angtk/2

esln,s
edele,all
esel,all

nsel,all

nd3=node(-ft/2-bwtk-bxid-angtk/2,ft/2+bwtk/2+2*cp+ltweld,0)

nsel,s,node,,nd3,nd2
esln,s,1
edele,all

nsel,s,node,,nd3+1,nd2-1
ndele,all
nsel,all

fill,nd3,nd2

mat,2
real,2

e,nd3,nd3+1
egen,nd2-nd3,1,-1

nsel,s,loc,x,ft/2+bwtk/2+cp
nsel,r,loc,y,ft/2+bwtk/2+2*cp+tol,ft/2+bwtk+2*cp+bxid+angtk/2-tol

nd1=node(ft/2+bwtk/2+cp,ft/2+bwtk+2*cp+bxid+angtk/2-offset,0)

nsel,s,loc,x,ft/2+bwtk+bxid+angtk/2
nsel,r,loc,y,ft/2+bwtk/2+2*cp+tol,ft/2+bwtk+2*cp+bxid+angtk/2-tol
```

```
nd2=node(ft/2+bwtk+bxid+angtk/2,ny(nd1),0)

nsel,s,node,,nd1
nsel,a,node,,nd2

nmodif,all,,ft/2+bwtk+2*cp+bxid+angtk/2-offset

mat,4
real,1

e,nd1,nd2

nsel,s,loc,x,ft/2+bwtk/2+cp
nsel,r,loc,y,ft/2+bwtk+2*cp+bxid+angtk/2-offset+tol,ft/2+bwtk+2*cp+bxid+angtk/2

esln,s
edele,all
esel,all

nsel,all

nd3=node(ft/2+bwtk+bxid+angtk/2,ft/2+bwtk/2+2*cp+ltweld,0)

nsel,s,node,,nd3,nd2
esln,s,1
edele,all

nsel,s,node,,nd3+1,nd2-1
ndele,all
nsel,all

fill,nd3,nd2

mat,2
real,2

e,nd3,nd3+1
egen,nd2-nd3,1,-1

nsel,s,loc,x,-ft/2-bwtk/2-cp
nsel,r,loc,y,-ft/2-bwtk-2*cp-bxid-angtk/2+tol,-ft/2-bwtk/2-2*cp-tol

nd1=node(-ft/2-bwtk/2-cp,-ft/2-bwtk-2*cp-bxid-angtk/2+offset,0)

nsel,s,loc,x,-ft/2-bwtk-bxid-angtk/2
nsel,r,loc,y,-ft/2-bwtk-2*cp-bxid-angtk/2+tol,-ft/2-bwtk/2-2*cp-tol

nd2=node(-ft/2-bwtk-bxid-angtk/2,ny(nd1),0)

nsel,s,node,,nd1
nsel,a,node,,nd2

nmodif,all,,-ft/2-bwtk-2*cp-bxid-angtk/2+offset

mat,4
real,1

e,nd1,nd2

nsel,s,loc,x,-ft/2-bwtk/2-cp
```

```
nsel,r,loc,y,-ft/2-bwtk-2*cp-bxid-angtk/2,-ft/2-bwtk-2*cp-bxid-angtk/2+offset-tol

esln,s
edele,all
esel,all

nsel,all

nd3=node(-ft/2-bwtk-bxid-angtk/2,-ft/2-bwtk/2-2*cp-ltweld,0)

nsel,s,node,,nd3,nd2
esln,s,1
edele,all

nsel,s,node,,nd3+1,nd2-1
ndele,all
nsel,all

fill,nd3,nd2

mat,2
real,2

e,nd3,nd3+1
egen,nd2-nd3,1,-1

nsel,s,loc,x,ft/2+bwtk/2+cp
nsel,r,loc,y,-ft/2-bwtk-2*cp-bxid-angtk/2+tol,-ft/2-bwtk/2-2*cp-tol

nd1=node(ft/2+bwtk/2+cp,-ft/2-bwtk-2*cp-bxid-angtk/2+offset,0)

nsel,s,loc,x,ft/2+bwtk+bxid+angtk/2
nsel,r,loc,y,-ft/2-bwtk-2*cp-bxid-angtk/2+tol,-ft/2-bwtk/2-2*cp-tol

nd2=node(ft/2+bwtk+bxid+angtk/2,ny(nd1),0)

nsel,s,node,,nd1
nsel,a,node,,nd2

nmodif,all,,-ft/2-bwtk-2*cp-bxid-angtk/2+offset

mat,4
real,1

e,nd1,nd2

nsel,s,loc,x,ft/2+bwtk/2+cp
nsel,r,loc,y,-ft/2-bwtk-2*cp-bxid-angtk/2,-ft/2-bwtk-2*cp-bxid-angtk/2+offset-tol

esln,s
edele,all
esel,all

nsel,all

nd3=node(ft/2+bwtk+bxid+angtk/2,-ft/2-bwtk/2-2*cp-ltweld,0)

nsel,s,node,,nd3,nd2
esln,s,1
edele,all
```

```
nsel,s,node,,nd3+1,nd2-1
ndele,all
nsel,all

fill,nd3,nd2

mat,2
real,2

e,nd3,nd3+1
egen,nd2-nd3,1,-1

esel,all
nsle
nsel,inve
ndele,all
nsel,all

! Create rigid beam elements
!
!local,17,0,-ft/2-bwtk-bxid/2,ft/2+bwtk+bxid/2,,90
!local,18,0,-ft/2-bwtk-bxid/2-cp,3*ft/2+bwtk+angtk+bxid/2,,180
!local,19,0,-ft/2-bwtk-bxid/2-2*cp,ft/2+bwtk+bxid/2,,90
!local,20,0,-3*ft/2-bwtk-angtk-bxid/2,ft/2+bwtk+bxid/2+cp
!local,21,0,-3*ft/2-bwtk-angtk-bxid/2-cp,3*ft/2+bwtk+angtk+bxid/2+cp,,-90
!local,22,0,-ft/2-bwtk-bxid/2,ft/2+bwtk+bxid/2+2*cp,,90
!
!local,23,0,ft/2+bwtk+bxid/2,-ft/2-bwtk-bxid/2,,-90
!local,24,0,ft/2+bwtk+bxid/2+cp,-3*ft/2-bwtk-angtk-bxid/2
!local,25,0,ft/2+bwtk+bxid/2+2*cp,-ft/2-bwtk-bxid/2,,-90
!local,26,0,3*ft/2+bwtk+angtk+bxid/2,-ft/2-bwtk-bxid/2-cp,,180
!local,27,0,3*ft/2+bwtk+angtk+bxid/2+cp,-3*ft/2-bwtk-angtk-bxid/2-cp,,90
!local,28,0,ft/2+bwtk+bxid/2,-ft/2-bwtk-bxid/2-2*cp,,-90
!
!local,29,0,-ft/2-bwtk-bxid/2,-ft/2-bwtk-bxid/2,,180
!local,30,0,-ft/2-bwtk-bxid/2-cp,-3*ft/2-bwtk-angtk-bxid/2,,90
!local,31,0,-ft/2-bwtk-bxid/2-2*cp,-ft/2-bwtk-bxid/2,,180
!local,32,0,-3*ft/2-bwtk-angtk-bxid/2,-ft/2-bwtk-bxid/2-cp,,-90
!local,33,0,-3*ft/2-bwtk-angtk-bxid/2-cp,-3*ft/2-bwtk-angtk-bxid/2-cp
!local,34,0,-ft/2-bwtk-bxid/2,-ft/2-bwtk-bxid/2-2*cp,,180
!
!*do,i,1,24,1
!  csys,10+i
!  nd1=node(-bxid/2-bwtk/2,-bxid/2-bwtk/2,0)
!  nd2=node(bxid/2+angtk/2,-bxid/2-bwtk/2,0)
!  nd3=node(-bxid/2-bwtk/2,bxid/2+angtk/2,0)
!  *if,mod(i,3),ne,0,then
!    nd4=node(cp-bxid/2-bwtk/2,-bxid/2-bwtk/2,0)
!    nd5=node(cp-bxid/2-bwtk/2,-bxid/2+ft+angtk/2,0)
!    nd6=node(-bxid/2-bwtk/2,cp-bxid/2-bwtk/2,0)
!    nd7=node(-bxid/2+ft+angtk/2,cp-bxid/2-bwtk/2,0)
!    nd8=node(cp-bxid/2-bwtk/2,cp-bxid/2-bwtk/2,0)
!  *endif
!  nsel,s,node,,nd1
!  nsel,a,node,,nd2
!  nsel,a,node,,nd3
!  *if,mod(i,3),ne,0,then
!    nsel,a,node,,nd4
!    nsel,a,node,,nd5
```

```
!     nsel,a,node,,nd6
!     nsel,a,node,,nd7
!     nsel,a,node,,nd8
!   *endif
!   esln
!   nsle
!   emodif,all,type,11
!   emodif,all,real,14
!   nsel,all
!   esel,all
!*enddo
!
!csys,0
!
!nd1=node(3*ft/2+bwtk+cp+angtk/2,-ft/2-bwtk/2,0)
!nd2=node(3*ft/2+bwtk+cp+angtk/2,ft/2+bwtk/2,0)
!nd3=node(ft/2+bwtk/2,3*ft/2+bwtk+cp+angtk/2,0)
!nd4=node(-ft/2-bwtk/2,3*ft/2+bwtk+cp+angtk/2,0)
!nd5=node(-3*ft/2-bwtk-cp-angtk/2,ft/2+bwtk/2,0)
!nd6=node(-3*ft/2-bwtk-cp-angtk/2,-ft/2-bwtk/2,0)
!nd7=node(-ft/2-bwtk/2,-3*ft/2-bwtk-cp-angtk/2,0)
!nd8=node(ft/2+bwtk/2,-3*ft/2-bwtk-cp-angtk/2,0)
!
!nsel,s,node,,nd1
!nsel,a,node,,nd2
!nsel,a,node,,nd3
!nsel,a,node,,nd4
!nsel,a,node,,nd5
!nsel,a,node,,nd6
!nsel,a,node,,nd7
!nsel,a,node,,nd8
!
!esln
!nsle
!emodif,all,type,1
!emodif,all,real,1
!
!nsel,all
!esel,all

! Modify material and real numbers of center walls

nsel,s,loc,x,-ft/2-bwtk/2
nsel,a,loc,x,ft/2+bwtk/2
nsel,a,loc,y,-ft/2-bwtk/2
nsel,a,loc,y,ft/2+bwtk/2

esln,s,1
!esel,u,type,,11
emodif,all,real,3

esel,s,mat,,1,2
nsle
nsel,r,loc,x,-ft/2-bwtk/2
esln,s,1
emodif,all,mat,3

esel,s,mat,,1,2
nsle
nsel,r,loc,x,ft/2+bwtk/2
```

```
esln,s,1
emodif,all,mat,3

esel,s,mat,,1,2
nsle
nsel,r,loc,y,-ft/2-bwtk/2
esln,s,1
emodif,all,mat,3

esel,s,mat,,1,2
nsle
nsel,r,loc,y,ft/2+bwtk/2
esln,s,1
emodif,all,mat,3

nsel,all
esel,all

! Modify element type numbers

! Define local coordinate system at the center of each box

local,101,0,ft/2+bwtk+bxid/2,ft/2+bwtk+bxid/2
local,102,0,ft/2+bwtk+bxid/2+cp,3*ft/2+bwtk+angtk+bxid/2
local,103,0,ft/2+bwtk+bxid/2+2*cp,ft/2+bwtk+bxid/2
local,104,0,3*ft/2+bwtk+angtk+bxid/2,ft/2+bwtk+bxid/2+cp
local,105,0,3*ft/2+bwtk+angtk+bxid/2+cp,3*ft/2+bwtk+angtk+bxid/2+cp
local,106,0,ft/2+bwtk+bxid/2,ft/2+bwtk+bxid/2+2*cp

local,107,0,-ft/2-bwtk-bxid/2,ft/2+bwtk+bxid/2
local,108,0,-ft/2-bwtk-bxid/2-cp,3*ft/2+bwtk+angtk+bxid/2
local,109,0,-ft/2-bwtk-bxid/2-2*cp,ft/2+bwtk+bxid/2
local,110,0,-3*ft/2-bwtk-angtk-bxid/2,ft/2+bwtk+bxid/2+cp
local,111,0,-3*ft/2-bwtk-angtk-bxid/2-cp,3*ft/2+bwtk+angtk+bxid/2+cp
local,112,0,-ft/2-bwtk-bxid/2,ft/2+bwtk+bxid/2+2*cp

local,113,0,ft/2+bwtk+bxid/2,-ft/2-bwtk-bxid/2
local,114,0,ft/2+bwtk+bxid/2+cp,-3*ft/2-bwtk-angtk-bxid/2
local,115,0,ft/2+bwtk+bxid/2+2*cp,-ft/2-bwtk-bxid/2
local,116,0,3*ft/2+bwtk+angtk+bxid/2,-ft/2-bwtk-bxid/2-cp
local,117,0,3*ft/2+bwtk+angtk+bxid/2+cp,-3*ft/2-bwtk-angtk-bxid/2-cp
local,118,0,ft/2+bwtk+bxid/2,-ft/2-bwtk-bxid/2-2*cp

local,119,0,-ft/2-bwtk-bxid/2,-ft/2-bwtk-bxid/2
local,120,0,-ft/2-bwtk-bxid/2-cp,-3*ft/2-bwtk-angtk-bxid/2
local,121,0,-ft/2-bwtk-bxid/2-2*cp,-ft/2-bwtk-bxid/2
local,122,0,-3*ft/2-bwtk-angtk-bxid/2,-ft/2-bwtk-bxid/2-cp
local,123,0,-3*ft/2-bwtk-angtk-bxid/2-cp,-3*ft/2-bwtk-angtk-bxid/2-cp
local,124,0,-ft/2-bwtk-bxid/2,-ft/2-bwtk-bxid/2-2*cp

*do,i,1,24,1
  csys,100+i
  nsel,s,loc,y,-(bxid+angtk)/2,-(bxid+bwtk)/2
  nsel,r,loc,x,-(bxid+bwtk)/2-tol,(bxid+bwtk)/2+tol
  esln,s,1
!  esel,u,type,,11
  emodif,all,type,9
  nsel,s,loc,x,(bxid+angtk)/2,(bxid+bwtk)/2
  nsel,r,loc,y,-(bxid+bwtk)/2-tol,(bxid+bwtk)/2+tol
  esln,s,1
```

```
!  esel,u,type,,11
  emodif,all,type,10
*enddo

nsel,all
esel,all

csys,0                ! Cartesian coordinates

! Increase inner dimension of corner boxes

csys,105
nsel,s,loc,y,-bxid/2-angtk/2-ltweld,-bxid/2-angtk/2+ltweld
nsel,r,loc,x,-bxid/2-angtk/2,bxid/2+bwtk/2
ngen,2,0,all,,,,bxid-bxid2
nsel,s,loc,x,-bxid/2-angtk/2-ltweld,-bxid/2-angtk/2+ltweld
nsel,r,loc,y,bxid/2-bxid2-angtk/2,bxid/2+bwtk/2
ngen,2,0,all,,,bxid-bxid2

csys,111
nsel,s,loc,y,-bxid/2-angtk/2-ltweld,-bxid/2-angtk/2+ltweld
nsel,r,loc,x,-bxid/2-bwtk/2,bxid/2+angtk/2
ngen,2,0,all,,,,bxid-bxid2
nsel,s,loc,x,bxid/2+angtk/2-ltweld,bxid/2+angtk/2+ltweld
nsel,r,loc,y,bxid/2-bxid2-angtk/2,bxid/2+bwtk/2
ngen,2,0,all,,,bxid2-bxid

csys,117
nsel,s,loc,y,bxid/2+angtk/2-ltweld,bxid/2+angtk/2+ltweld
nsel,r,loc,x,-bxid/2-angtk/2,bxid/2+bwtk/2
ngen,2,0,all,,,,bxid2-bxid
nsel,s,loc,x,-bxid/2-angtk/2-ltweld,-bxid/2-angtk/2+ltweld
nsel,r,loc,y,-bxid/2-bwtk/2,bxid2-bxid/2+angtk/2
ngen,2,0,all,,,bxid-bxid2

csys,123
nsel,s,loc,y,bxid/2+angtk/2-ltweld,bxid/2+angtk/2+ltweld
nsel,r,loc,x,-bxid/2-bwtk/2,bxid/2+angtk/2
ngen,2,0,all,,,,bxid2-bxid
nsel,s,loc,x,bxid/2+angtk/2-ltweld,bxid/2+angtk/2+ltweld
nsel,r,loc,y,-bxid/2-bwtk/2,bxid2-bxid/2+angtk/2
ngen,2,0,all,,,bxid2-bxid

nsel,all
csys,0

! Check i,j orientation for each element

*get,nel,elem,,count
*get,el,elem,,num,min

*do,i,1,nel,1
  nd1=nelem(el,1)
  nd2=nelem(el,2)
  *if,nx(nd1),gt,nx(nd2),then
    emodif,el,-1,nd2,nd1
  *elseif,ny(nd1),gt,ny(nd2)
    emodif,el,-1,nd2,nd1
  *endif
  el=elnext(el)
```

```
*enddo

!**************   Canister shell   ************************************

! Define nodes for canister shell

csys,0                ! Cartesian coordinates

*get,mxnd,node,,num,max

x=ft/2+bwtk+2*cp+bxid+angtk/2
ycs=sqrt(csrd**2-x**2)

n,mxnd+1,-x,ycs
n,mxnd+2,-x,-ycs
n,mxnd+3,x,ycs
n,mxnd+4,x,-ycs

x=ft/2+bwtk/2+2*cp
ycs=sqrt(csrd**2-x**2)

n,mxnd+5,-x,ycs
n,mxnd+6,-x,-ycs
n,mxnd+7,x,ycs
n,mxnd+8,x,-ycs

x=ft/2+bwtk/2+cp
ycs=sqrt(csrd**2-x**2)

n,mxnd+9,-x,ycs
n,mxnd+10,-x,-ycs
n,mxnd+11,x,ycs
n,mxnd+12,x,-ycs

x=ft/2+bwtk+bxid+angtk/2
ycs=sqrt(csrd**2-x**2)

n,mxnd+13,-x,ycs
n,mxnd+14,-x,-ycs
n,mxnd+15,x,ycs
n,mxnd+16,x,-ycs

x=ft/2+bwtk/2
ycs=sqrt(csrd**2-x**2)

n,mxnd+17,-x,ycs
n,mxnd+18,-x,-ycs
n,mxnd+19,x,ycs
n,mxnd+20,x,-ycs

csys,1

ngen,2,20,mxnd+1,mxnd+20,,,90

n,mxnd+41,csrd,90
n,mxnd+42,csrd,135
n,mxnd+43,csrd,270
n,mxnd+44,csrd,315

nsel,s,loc,x,csrd,csrd+tol
```

```
*get,nnd,node,,count

*dim,nodes,,nnd
*do,i,1,nnd,1
  *get,y,node,,mnloc,y
  nodes(i)=node(csrd,y,0)
  nsel,u,node,,nodes(i)
*enddo
nsel,all

*get,mxnd,node,,num,max
nd=mxnd+1                    ! First node number for canister shell

n,nd,nx(nodes(1)),ny(nodes(1))
*do,i,1,nnd-1,1
  *get,mxnd,node,,num,max
  th1=ny(nodes(i+1))
  th2=ny(nodes(i))
  arc=th1-th2
  ceil,arc/ltcsel
  ncsel=ans
  n,mxnd+ncsel,nx(nodes(i+1)),ny(nodes(i+1))
  fill
*enddo

th1=ny(nodes(1))
th2=ny(nodes(nnd))
arc=360+th1-th2
ceil,arc/ltcsel
ncsel=ans
yinc=arc/ncsel

*do,i,1,ncsel,1
  *get,mxnd,node,,num,max
  n,mxnd+1,csrd,ny(nodes(nnd))+i*yinc
*enddo

csys,0                ! Cartesian coordinates

! Define elements for canister shell

type,3
mat,6
real,4

*get,mxnd,node,,num,max

e,nd,nd+1
egen,mxnd-nd,1,-1

esel,all
nsel,all
nummrg,node

!**************   Basket/shell contact   ******************************

! Define basket/shell contact elements (x dir.)

type,6
```

```
mat,9
real,7

y=ft/2+bwtk+2*cp+bxid+angtk/2

nsel,s,loc,y,y

*get,x,node,,mnloc,x
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,s,loc,y,-y

*get,x,node,,mnloc,x
nd1=node(x,-y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,-y,0)
nd1=nnear(nd2)
e,nd1,nd2

y=ft/2+bwtk/2+2*cp

nsel,s,loc,y,y

*get,x,node,,mnloc,x
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,s,loc,y,-y

*get,x,node,,mnloc,x
nd1=node(x,-y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,-y,0)
nd1=nnear(nd2)
e,nd1,nd2

y=ft/2+bwtk/2+cp

nsel,s,loc,y,y

*get,x,node,,mnloc,x
```

```
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,s,loc,y,-y

*get,x,node,,mnloc,x
nd1=node(x,-y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,-y,0)
nd1=nnear(nd2)
e,nd1,nd2

y=ft/2+bwtk+bxid+angtk/2

nsel,s,loc,y,y

*get,x,node,,mnloc,x
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,s,loc,y,-y

*get,x,node,,mnloc,x
nd1=node(x,-y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,-y,0)
nd1=nnear(nd2)
e,nd1,nd2

y=ft/2+bwtk/2

nsel,s,loc,y,y

*get,x,node,,mnloc,x
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2
```

```
nsel,s,loc,y,-y

*get,x,node,,mnloc,x
nd1=node(x,-y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,x,node,,mxloc,x
nd2=node(x,-y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,all

! Define basket/shell contact elements (y dir.)

type,6
mat,9
real,8

x=ft/2+bwtk+2*cp+bxid+angtk/2

nsel,s,loc,x,x

*get,y,node,,mnloc,y
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,s,loc,x,-x

*get,y,node,,mnloc,y
nd1=node(-x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(-x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

x=ft/2+bwtk/2+2*cp

nsel,s,loc,x,x

*get,y,node,,mnloc,y
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2
```

```
nsel,s,loc,x,-x

*get,y,node,,mnloc,y
nd1=node(-x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(-x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

x=ft/2+bwtk/2+cp

nsel,s,loc,x,x

*get,y,node,,mnloc,y
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,s,loc,x,-x

*get,y,node,,mnloc,y
nd1=node(-x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(-x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

x=ft/2+bwtk+bxid+angtk/2

nsel,s,loc,x,x

*get,y,node,,mnloc,y
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,s,loc,x,-x

*get,y,node,,mnloc,y
nd1=node(-x,y,0)
nd2=nnear(nd1)
e,nd1,nd2
```

```
*get,y,node,,mxloc,y
nd2=node(-x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

x=ft/2+bwtk/2

nsel,s,loc,x,x

*get,y,node,,mnloc,y
nd1=node(x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,s,loc,x,-x

*get,y,node,,mnloc,y
nd1=node(-x,y,0)
nd2=nnear(nd1)
e,nd1,nd2

*get,y,node,,mxloc,y
nd2=node(-x,y,0)
nd1=nnear(nd2)
e,nd1,nd2

nsel,all

! Modify contact element real constants

nsel,s,loc,x,-csrd-tol,0
esln,s,1
esel,r,real,,7
emodif,all,real,9

nsel,s,loc,y,-csrd-tol,0
esln,s,1
esel,r,real,,8
emodif,all,real,10

esel,all
nsel,all

fini

save

:end

/output,term
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

**BC-0DEG.INP**

```
! \\projects\5014\cbullard\mpc-24e\hi-storm\side0\closed\bc-0deg.inp
!
! The following ANSYS input file defines the boundary conditions for
! the MPC structural model when accelerations are applied in the
! vertical direction (90 deg - 270 deg axis as shown in Holtec Dwg.
! No. 1395).

/solu

esel,s,type,,7          ! Select shell/overpack contact elements
nsle                ! Select nodes associated with elements

csys,200            ! Local c.s. at center of overpack radius

nsel,r,loc,x,oprd,oprd+tol     ! Select nodes that define overpack
                        ! surface

d,all,all,0         ! Fix nodes in all DOFs

esel,all            ! Select all elements
nsel,all            ! Select all nodes

csys,0                  ! Cartesian coordinates

esel,u,type,,7          ! Unselect shell/overpack contact elements
nsle                ! Select nodes associated with elements

nd1=node(0,-ft/2-bwtk-2*cp-bxid-angtk/2-gap,0)
nd2=node(0,csrd,0)
nd3=node(0,-csrd,0)
nd4=node(0,-csrd-0.1,0)

nsel,s,node,,nd1    ! Select centerline nodes
nsel,a,node,,nd2
nsel,a,node,,nd3

d,all,ux,0          ! Constrain nodes to move only along the
                    ! centerline (ux=0)

nsel,s,node,,nd4    ! Select overpack node that is connected to
                    ! shell by spring

d,all,all,0         ! Fix node in all DOFs

esel,all            ! Select all elements
nsel,all            ! Select all nodes

fini
```

**DROP0.INP**

```
! \\projects\5014\cbullard\mpc-24e\hi-storm\side0\closed\drop0.inp
!
! The following ANSYS input file simulates the effects of a drop
! accident.  The direction of the impact acceleration is parallel
! with the 90 deg - 270 deg axis as shown in Holtec Dwg. No. 1395.
!
! The weight of the stored fuel assemblies is applied to the
! structural model as a pressure load (lbf/in).  The pressure is applied
! only to the box walls that support the fuel.
!
! The elements that establish contact between the canister shell and
! the overpack are defined in this file.  The element properties
! (type, mat, real) are defined in "mpc-24e.inp".
!
! ANSYS requires that all bodies (i.e., fuel basket) are constrained
! to prevent rigid body motion.  A 2-D linear spring is used to
! connect the fuel basket to the canister shell at the point of intial
! contact.  This provides the necessary constraint to the fuel basket
! in the direction of the impact.  In this location where the gap
! always remains closed, the behavior of the spring is indentical to a
! contact element.  This same modeling technique is used to connect
! the canister shell to the overpack.  The properties of the springs
! are defined in "mpc-24e.inp".


!**************   Input data   ****************************************

! Load data

gload=45            ! Acceleration amplifier, g

theta=0             ! Angle subtended by cask and ground, deg

!**************   Modify finite element model   **********************

/prep7

! Define 2-D linear spring connecting basket to shell

nsel,s,loc,x,-ft/2-bwtk/2

*get,mny,node,,mnloc,y

nd1=node(-ft/2-bwtk/2,mny,0)
nd2=nnear(nd1)

nsel,s,loc,x,ft/2+bwtk/2

*get,mny,node,,mnloc,y

nd3=node(ft/2+bwtk/2,mny,0)
nd4=nnear(nd3)
```

```
nsel,s,node,,nd1
nsel,a,node,,nd2
nsel,a,node,,nd3
nsel,a,node,,nd4

esln,s,1
esel,r,type,,6
edele,all

type,8
real,11

e,nd1,nd2
e,nd3,nd4

esel,all
nsel,all

! Move basket nodes and elements

! The basket is moved downward a distance that is equal to the average
! gap between the fuel basket and the canister shell.  This procedure
! closes the bottom gaps.

esel,s,type,,1
esel,a,type,,9
esel,a,type,,10
nsle

ngen,2,0,all,,,,-gap

esel,all
nsel,all

rmodif,8,3,-2*gap
rmodif,10,3,0

! Define nodes and elements for shell/overpack contact

*get,mxnd,node,,num,max
nd=mxnd+1

local,200,1,0,oprd-csrd

n,nd,oprd,135
n,nd+1,oprd,270
n,nd+2,oprd,45

csys,1                    ! Cylindrical coordinates

esel,s,type,,3
nsle
nsel,r,loc,y,152.5,269.9
```

```
nsel,u,loc,y,162.5+tol,175-tol
nsel,u,loc,y,185+tol,197.5-tol
nsel,u,loc,y,207.5+tol,220-tol
nsel,u,loc,y,230+tol,242.5-tol
nsel,u,loc,y,252.5+tol,265-tol

*get,nnd,node,,count

type,7
real,12

*do,i,1,nnd,1
  *get,mnnd,node,,num,min
  e,mnnd,nd,nd+1
  nsel,u,node,,mnnd
*enddo

nsle
nsel,r,loc,y,-89.9,27.5
nsel,u,loc,y,-85+tol,-72.5-tol
nsel,u,loc,y,-62.5+tol,-50-tol
nsel,u,loc,y,-40+tol,-27.5-tol
nsel,u,loc,y,-17.5+tol,-5-tol
nsel,u,loc,y,5+tol,17.5-tol

*get,nnd,node,,count

*do,i,1,nnd,1
  *get,mnnd,node,,num,min
  e,mnnd,nd+1,nd+2
  nsel,u,node,,mnnd
*enddo

esel,all
nsel,all

! Define 2-D linear spring connecting shell to overpack

csys,0                    ! Cartesian coordinates

*get,mxnd,node,,num,max

n,mxnd+1,0,-csrd-0.1

esel,s,type,,3
nsle

nd=node(0,-csrd,0)

type,8
real,13

e,mxnd+1,nd
```

```
esel,all
nsel,all

fini

!**************   Apply loads to model   ******************************

/solu

fact=gload*cos(theta)     ! Radial component of acceleration

acel,0,fact*g,0           ! Acceleration vector

esel,s,type,,9

sfbeam,all,1,pres,fact*fawt/(falt*(bxid+bwtk/2+angtk/2))     ! Fuel pressure
load

esel,all

fini
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

**SIDE0.INP**

```
! \\projects\5014\cbullard\mpc-24e\hi-storm\side0\closed\side0.inp
!
! The following ANSYS input file applies the loads and the boundary
! conditions to the structural model which are necessary to simulate
! a 0 degree side drop event.


/output,side0,lst

fini
/clear

resume,mpc-24e,db
/filnam,side0

!**************   Input data   ****************************************

bwref=725          ! Fuel basket reference temperature, F
csref=450          ! Canister shell reference temperature, F

Pi=100                   ! Internal pressure, psi

lcomb1='F2.a'            ! Load case I.D. for fuel basket
                   ! (See Table 2.1.6 of HI-951251, Rev. 4)

lcomb2='E2.a'            ! Load case I.D. for enclosure vessel
                   ! (See Table 2.1.7 of HI-951251, Rev. 4)

!**************   Load and boundary condition files   ****************

/input,drop0,inp

/input,bc-0deg,inp

/solu

tref,70

! Set coefficients of thermal expansion to zero

*do,i,1,8,1
  mp,alpx,i,0
*enddo

! Apply reference temperatures

esel,s,type,,1
esel,a,type,,9
esel,a,type,,10
nsle

bf,all,temp,bwref
```

```
esel,s,type,,3,5
nsle

bf,all,temp,csref

esel,all
nsel,all

save

solve

fini

/output,term
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

**BC-45DEG.INP**

```
! \\projects\5014\cbullard\mpc-24e\hi-storm\side45\closed\bc-45deg.inp
!
! The following ANSYS input file defines the boundary conditions for
! the MPC structural model when accelerations are applied at a 45 degree
! angle from vertical (135 deg - 315 deg axis as shown in Holtec Dwg.
! No. 1395).

/solu

esel,s,type,,7          ! Select shell/overpack contact elements
nsle                ! Select nodes associated with elements

csys,200            ! Local c.s. at center of overpack radius

nsel,r,loc,x,oprd,oprd+tol     ! Select nodes that define overpack
                        ! surface

d,all,all,0         ! Fix nodes in all DOFs

esel,all            ! Select all elements
nsel,all            ! Select all nodes

csys,0                  ! Cartesian coordinates

nd1=node(ft/2+bwtk/2+2*cp+gap,-ft/2-bwtk/2-2*cp-gap,0)
nd2=node(-ft/2-bwtk/2-2*cp+gap,ft/2+bwtk/2+2*cp-gap,0)

csys,1                  ! Cylindrical coordinates

esel,u,type,,7          ! Unselect shell/overpack contact elements
nsle                ! Select nodes associated with elements

nd3=node(csrd,135,0)
nd4=node(csrd,315,0)
nd5=node(csrd+0.1,315,0)

csys,0                  ! Cartesian coordinates

nsel,s,node,,nd1    ! Select centerline nodes
nsel,a,node,,nd2
nsel,a,node,,nd3
nsel,a,node,,nd4

d,all,ux,0          ! Constrain nodes to move only along the
                    ! 45 degree centerline (ux=0)

nsel,s,node,,nd5    ! Select overpack node that is connected to
                    ! shell by spring

d,all,all,0         ! Fix nodes in all DOFs

esel,all            ! Select all elements
```

```
nsel,all          ! Select all nodes

fini
```

**DROP45.INP**

```
! \\projects\5014\cbullard\mpc-24e\hi-storm\side45\closed\drop45.inp
!
! The following ANSYS input file simulates the effects of a drop
! accident.  The direction of the impact acceleration is parallel
! with the 135 deg - 315 deg axis as shown in Holtec Dwg. No. 1395.
!
! The weight of the stored fuel assemblies is applied to the
! structural model as a pressure load (lbf/in).  The pressure is applied
! only to the box walls that directly support the fuel.
!
! The elements that establish contact between the canister shell and
! the overpack are defined in this file.  The element properties
! (type, mat, real) are defined in "mpc-24e.inp".
!
! ANSYS requires that all bodies (i.e., fuel basket) are constrained
! to prevent rigid body motion.  A 2-D linear spring is used to
! connect the fuel basket to the canister shell at the point of intial
! contact.  This provides the necessary constraint to the fuel basket
! in the direction of the impact.  In this location where the gap
! always remains closed, the behavior of the spring is indentical to a
! contact element.  This same modeling technique is used to connect
! the canister shell to the overpack.  The properties of the springs
! are defined in "mpc-24e.inp".


!**************   Input data   ****************************************

! Load data

gload=45          ! Acceleration amplifier, g

theta=0                 ! Angle subtended by cask and ground, deg

!**************   Modify finite element model   **********************

/prep7

! Define 2-D linear spring connecting basket to shell

nd1=node(ft/2+bwtk/2+2*cp,-ft/2-bwtk/2-2*cp,0)

nsel,s,node,,nd1

esln,s,0
esel,r,type,,6

edele,all

esel,all
nsel,all

csys,1
```

```
nd2=node(csrd,315,0)

csys,0

type,8
real,11

e,nd2,nd1

esel,all
nsel,all

! Move basket nodes and elements

! The basket is moved downward and to the right a distance that is equal to
! the average gap between the fuel basket and the canister shell.  This
! procedure closes the bottom and the right gaps.

esel,s,type,,1
esel,a,type,,9
esel,a,type,,10
!esel,a,type,,11
nsle

ngen,2,0,all,,,gap,-gap

esel,all
nsel,all

rmodif,7,3,0
rmodif,8,3,-2*gap
rmodif,9,3,-2*gap
rmodif,10,3,0

! Define nodes and elements for shell/overpack contact

*get,mxnd,node,,num,max
nd=mxnd+1

local,200,1,-(oprd-csrd)/sqrt(2),(oprd-csrd)/sqrt(2)

n,nd,oprd,180
n,nd+1,oprd,315
n,nd+2,oprd,90

csys,1                    ! Cylindrical coordinates

esel,s,type,,3
nsle
nsel,r,loc,y,-162.5,-45.1
nsel,u,loc,y,-152.5+tol,-140-tol
nsel,u,loc,y,-130+tol,-117.5-tol
nsel,u,loc,y,-107.5+tol,-95-tol
```

```
nsel,u,loc,y,-85+tol,-72.5-tol
nsel,u,loc,y,-62.5+tol,-50-tol

*get,nnd,node,,count

type,7
real,12

*do,i,1,nnd,1
  *get,mnnd,node,,num,min
  e,mnnd,nd,nd+1
  nsel,u,node,,mnnd
*enddo

nsle
nsel,r,loc,y,-44.9,72.5
nsel,u,loc,y,-40+tol,-27.5-tol
nsel,u,loc,y,-17.5+tol,-5-tol
nsel,u,loc,y,5+tol,17.5-tol
nsel,u,loc,y,27.5+tol,40-tol
nsel,u,loc,y,50+tol,62.5-tol

*get,nnd,node,,count

*do,i,1,nnd,1
  *get,mnnd,node,,num,min
  e,mnnd,nd+1,nd+2
  nsel,u,node,,mnnd
*enddo

esel,all
nsel,all

! Define 2-D linear spring connecting shell to overpack

csys,1                    ! Cylindrical coordinates

*get,mxnd,node,,num,max

n,mxnd+1,csrd+0.1,315

esel,s,type,,3
nsle

nd=node(csrd,315,0)

type,8
real,13

e,mxnd+1,nd

esel,all
nsel,all
```

```
! Rotate nodal coordinate systems

csys,0                    ! Cartesian coordinates

nd2=node(-ft/2-bwtk/2-2*cp+gap,ft/2+bwtk/2+2*cp-gap,0)

csys,1                    ! Cylindrical coordinates

esel,s,type,,3
nsle

nd3=node(csrd,135,0)
nd4=node(csrd,315,0)

nsel,s,node,,nd1
nsel,a,node,,nd2
nsel,a,node,,nd3
nsel,a,node,,nd4

csys,0                    ! Cartesian coordinates

local,300,0,,,,45

nrotat,all

esel,all
nsel,all

fini

!**************   Apply loads to model   ******************************

/solu

fact=gload*cos(theta)    ! Radial component of acceleration

acel,-fact*g/sqrt(2),fact*g/sqrt(2),0        ! Acceleration vector

! Fuel pressure load

esel,s,type,,9

sfbeam,all,1,pres,fact*fawt/(sqrt(2)*falt*(bxid+bwtk/2+angtk/2))

esel,s,type,,10

sfbeam,all,1,pres,fact*fawt/(sqrt(2)*falt*(bxid+bwtk/2+angtk/2))

esel,all

fini
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

**SIDE45.INP**

```
! \\projects\5014\cbullard\mpc-24e\hi-storm\side45\closed\side45.inp
!
! The following ANSYS input file applies the loads and the boundary
! conditions to the structural model which are necessary to simulate
! a 45 degree side drop event.


/output,side45,lst

fini
/clear

resume,mpc-24e,db
/filnam,side45

!**************   Input data   ****************************************

bwref=725          ! Fuel basket reference temperature, F
csref=450          ! Canister shell reference temperature, F

Pi=100                   ! Internal pressure, psi

lcomb1='F2.b'            ! Load case I.D. for fuel basket
                   ! (See Table 2.1.6 of HI-951251, Rev. 4)

lcomb2='E2.b'            ! Load case I.D. for enclosure vessel
                   ! (See Table 2.1.7 of HI-951251, Rev. 4)

!**************   Load and boundary condition files   ****************

/input,drop45,inp

/input,bc-45deg,inp

/solu

tref,70

! Set coefficients of thermal expansion to zero

*do,i,1,8,1
  mp,alpx,i,0
*enddo

! Apply reference temperatures

esel,s,type,,1
esel,a,type,,9
esel,a,type,,10
!esel,a,type,,11
nsle
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

```
bf,all,temp,bwref

esel,s,type,,3,5
nsle

bf,all,temp,csref

esel,all
nsel,all

save

neqit,200

solve

fini

/output,term
```

**POST.INP**

```
! \\projects\5014\cbullard\mpc-24e\hi-storm\side45\closed\post.inp
!
! The following ANSYS input file processes and formats the stress
! results.  The final results for the fuel basket, the canister
! shell, and the basket support structure are stored in separate
! output files.

/output,post,lst

fini
/clear

*ask,load,Enter the name of the load case.

/filnam,%load%
resume,%load%,db

*ask,basket,Enter the type of MPC.
*ask,level,Enter the service limit.

!**************   Input data   ****************************************

! Material data

*dim,mtemp,,6            ! Temperature values, F
mtemp(1)=200
mtemp(2)=300             ! ANSYS allows only 6 values (TALLOW)
mtemp(3)=400
mtemp(4)=500             ! Temperatures must be in ascending order
mtemp(5)=600
mtemp(6)=700

*dim,ult,,6        ! Ultimate stress of Alloy X, psi
ult(1)=71000
ult(2)=66000             ! Values correspond with temperatures
ult(3)=64400
ult(4)=63500
ult(5)=63100
ult(6)=62500

! Allowable stress limits

! Fuel basket (See Tables 3.1.15 and 3.1.16 of HI-941184, Rev. 4)

*dim,fbtemp,,6           ! Temperature values, F
fbtemp(1)=300
fbtemp(2)=400            ! ANSYS allows only 6 values (TALLOW)
fbtemp(3)=500
fbtemp(4)=600            ! Temperatures must be in ascending order
fbtemp(5)=700
fbtemp(6)=750
```

```
*dim,fbpmA,,6            ! Primary membrane allowable, psi (Level A)
fbpmA(1)=20000
fbpmA(2)=18700           ! Values correspond with temperatures
fbpmA(3)=17500
fbpmA(4)=16400
fbpmA(5)=15600
fbpmA(6)=15200

*dim,fbpmD,,6            ! Primary membrane allowable, psi (Level D)
fbpmD(1)=46200
fbpmD(2)=44900           ! Values correspond with temperatures
fbpmD(3)=42000
fbpmD(4)=39400
fbpmD(5)=37400
fbpmD(6)=36500

*dim,fbplpbA,,6          ! Local membrane plus primary bending allowable, psi
(Level A)
fbplpbA(1)=30000
fbplpbA(2)=28100  ! Values correspond with temperatures
fbplpbA(3)=26300
fbplpbA(4)=24600
fbplpbA(5)=23400
fbplpbA(6)=22800

*dim,fbplpbD,,6          ! Local membrane plus primary bending allowable, psi
(Level D)
fbplpbD(1)=69300
fbplpbD(2)=67400  ! Values correspond with temperatures
fbplpbD(3)=63000
fbplpbD(4)=59100
fbplpbD(5)=56100
fbplpbD(6)=54800

! Canister shell (See Table 3.1.13 and 3.1.14 of HI-941184, Rev. 4)

*dim,cstemp,,6           ! Temperature values, F
cstemp(1)=200
cstemp(2)=300            ! ANSYS allows only 6 values (TALLOW)
cstemp(3)=400
cstemp(4)=500            ! Temperatures must be in ascending order
cstemp(5)=600
cstemp(6)=700

*dim,cspmA,,6            ! Primary membrane allowable, psi (Level A)
cspmA(1)=20000
cspmA(2)=20000           ! Values correspond with temperatures
cspmA(3)=18700
cspmA(4)=17500
cspmA(5)=16400
cspmA(6)=15600

*dim,cspmD,,6            ! Primary membrane allowable, psi (Level D)
cspmD(1)=48000
```

```
cspmD(2)=46200          ! Values correspond with temperatures
cspmD(3)=44900
cspmD(4)=42000
cspmD(5)=39400
cspmD(6)=37400

*dim,csplpbA,,6         ! Local membrane plus primary bending allowable, psi
(Level A)
csplpbA(1)=30000
csplpbA(2)=30000  ! Values correspond with temperatures
csplpbA(3)=28100
csplpbA(4)=26300
csplpbA(5)=24600
csplpbA(6)=23400

*dim,csplpbD,,6         ! Local membrane plus primary bending allowable, psi
(Level D)
csplpbD(1)=72000
csplpbD(2)=69300  ! Values correspond with temperatures
csplpbD(3)=67400
csplpbD(4)=63000
csplpbD(5)=59100
csplpbD(6)=56100

!**************   Format output files   ******************************

/page,,,10000
/header,off,off,off,off,on,off

!**************   Post-process results   ****************************

/post1

*get,load,active,,jobnam

file,%load%,rst

set,1

! Store results for all beam elements

esel,s,type,,1,4
esel,a,type,,9,10

etab,'ref temp',lbfe,1          ! Temperature (node i)
etab,sdiri,ls,1                 ! Axial stress (node i)
etab,sbyti,ls,2                 ! Bending stress at top (node i)
etab,sbybi,ls,3                 ! Bending stress at bottom (node i)
etab,sdirj,ls,4                 ! Axial stress (node j)
etab,sbytj,ls,5                 ! Bending stress at top (node j)
etab,sbybj,ls,6                 ! Bending stress at bottom (node j)
etab,smaxi,nmisc,1              ! Maximum stress (axial plus bending) (node i)
etab,smini,nmisc,2              ! Minimum stress (axial plus bending) (node i)
etab,smaxj,nmisc,3              ! Maximum stress (axial plus bending) (node j)
```

```
etab,sminj,nmisc,4              ! Minimum stress (axial plus bending) (node j)
etab,mforx,smisc,1              ! Axial force (node i)
etab,mfory,smisc,2              ! Shear force (node i)
etab,mmomz,smisc,6              ! Moment (node i)

sadd,zero,sdiri,sdiri,1,-1      ! Create etable of zeros
sadd,one,zero,,,,1              ! Create etable of ones

!**************   Fuel basket   ***************************************

esel,s,type,,1
esel,a,type,,9,10

! Calculate axial stress component

axlfb=denax*gload*g*sin(theta)*fblt

! Primary membrane

tallow,fbtemp(1),fbtemp(2),fbtemp(3),fbtemp(4),fbtemp(5),fbtemp(6)

*if,level,eq,'A',then
  sallow,fbpmA(1),fbpmA(2),fbpmA(3),fbpmA(4),fbpmA(5),fbpmA(6)
*else
  sallow,fbpmD(1),fbpmD(2),fbpmD(3),fbpmD(4),fbpmD(5),fbpmD(6)
*endif

smax,spos,zero,sdiri
sexp,sone,spos,sdiri,1,-1
smult,saxl,sone,,axlfb

sadd,sinti,sdiri,saxl

smax,spos,zero,sdirj
sexp,sone,spos,sdirj,1,-1
smult,saxl,sone,,axlfb

sadd,sintj,sdirj,saxl

sabs,1
smax,sint,sinti,sintj
sabs,0

sexp,invi,one,sinti,1,-1
smult,signi,sinti,invi
smult,pm,sint,signi

sfcalc,allow,one,'ref temp',1

sfcalc,sf,pm,'ref temp',1

esort,etab,sf,1

/output,table,1
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

```
/title,%basket% Structural Analysis
/stitle,1,Component: Fuel Basket
/stitle,2,Load Combination: %lcomb1% (See Table 2.1.6)
/stitle,3,Stress Result: Primary Membrane (PM)

pretab,'ref temp',pm,allow,sf

/output,term

eusort

! Local membrane plus bending

*if,level,eq,'A',then
  sallow,fbplpbA(1),fbplpbA(2),fbplpbA(3),fbplpbA(4),fbplpbA(5),fbplpbA(6)
*else
  sallow,fbplpbD(1),fbplpbD(2),fbplpbD(3),fbplpbD(4),fbplpbD(5),fbplpbD(6)
*endif

smax,smax,smaxi,smaxj
smin,smin,smini,sminj

smax,spos,zero,smax
sexp,sone,spos,smax,1,-1
smult,saxl,sone,,axlfb

sadd,sintmx,smax,saxl

smax,spos,zero,smin
sexp,sone,spos,smin,1,-1
smult,saxl,sone,,axlfb

sadd,sintmn,smin,saxl

sabs,1
smax,'pl+pb',sintmx,sintmn
sabs,0

sfcalc,allow,one,'ref temp',1

sfcalc,sf,'pl+pb','ref temp',1

esort,etab,sf,1

/output,table,2

/title,%basket% Structural Analysis
/stitle,1,Component: Fuel Basket
/stitle,2,Load Combination: %lcomb1% (See Table 2.1.6)
/stitle,3,Stress Result: Primary Local Plus Primary Bending (PL+PB)

pretab,'ref temp','pl+pb',allow,sf
```

```
/output,term

eusort

!**************   Canister shell   ************************************

esel,s,type,,3

! Calculate axial and hoop stress components

*get,nel,elem,,count
*get,el,elem,,num,min

arcs=0                    ! Canister shell area

*do,i,1,nel,1
  *get,nodei,elem,el,node,1
  *get,nodej,elem,el,node,2
  length=distnd(nodei,nodej)
  *get,rset,elem,el,attr,real
  *get,thick,rcon,rset,const,3
  arcs=arcs+length*thick
  el=elnext(el)
*enddo

axlcs=(denax*g*cslt+lidwt/arcs)*gload*sin(theta)-Pi*csrd/(2*cstk)

hoopcs=Pi*csrd/cstk

! Primary membrane

tallow,cstemp(1),cstemp(2),cstemp(3),cstemp(4),cstemp(5),cstemp(6)

*if,level,eq,'A',then
  sallow,cspmA(1),cspmA(2),cspmA(3),cspmA(4),cspmA(5),cspmA(6)
*else
  sallow,cspmD(1),cspmD(2),cspmD(3),cspmD(4),cspmD(5),cspmD(6)
*endif

sadd,sdir,sdiri,,,,hoopcs

*if,axlcs,gt,0,then
  smax,spos,zero,sdir
  sexp,sone,spos,sdir,1,-1
  smult,saxl,sone,,axlcs
  sadd,pm,sdir,saxl
*else
  smin,sneg,zero,sdir
  sexp,sone,sneg,sdir,1,-1
  smult,saxl,sone,,axlcs
  sadd,pm,sdir,saxl
*endif

sfcalc,allow,one,'ref temp',1
```

```
sfcalc,sf,pm,'ref temp',1

esort,etab,sf,1

/output,table,3

/title,%basket% Structural Analysis
/stitle,1,Component: Enclosure Vessel
/stitle,2,Load Combination: %lcomb2% (See Table 2.1.7)
/stitle,3,Stress Result: Primary Membrane (PM)

pretab,'ref temp',pm,allow,sf

/output,term

eusort

! Local membrane plus bending

*if,level,eq,'A',then
  sallow,csplpbA(1),csplpbA(2),csplpbA(3),csplpbA(4),csplpbA(5),csplpbA(6)
*else
  sallow,csplpbD(1),csplpbD(2),csplpbD(3),csplpbD(4),csplpbD(5),csplpbD(6)
*endif

smax,smax,smaxi,smaxj
smin,smin,smini,sminj

sadd,stotmx,smax,,,,hoopcs
sadd,stotmn,smin,,,,hoopcs

*if,axlcs,gt,0,then
  smax,spos,zero,stotmx
  sexp,sone,spos,stotmx,1,-1
  smult,saxl,sone,,axlcs
  sadd,sintmx,stotmx,saxl
  smax,spos,zero,stotmn
  sexp,sone,spos,stotmn,1,-1
  smult,saxl,sone,,axlcs
  sadd,sintmn,stotmn,saxl
*else
  smin,sneg,zero,stotmx
  sexp,sone,sneg,stotmx,1,-1
  smult,saxl,sone,,axlcs
  sadd,sintmx,stotmx,saxl
  smin,sneg,zero,stotmn
  sexp,sone,sneg,stotmn,1,-1
  smult,saxl,sone,,axlcs
  sadd,sintmn,stotmn,saxl
*endif

sabs,1
smax,'pl+pb',sintmx,sintmn
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

```
sabs,0

sfcalc,allow,one,'ref temp',1

sfcalc,sf,'pl+pb','ref temp',1

esort,etab,sf,1

/output,table,4

/title,%basket% Structural Analysis
/stitle,1,Component: Enclosure Vessel
/stitle,2,Load Combination: %lcomb2% (See Table 2.1.7)
/stitle,3,Stress Result: Primary Local Plus Primary Bending (PL+PB)

pretab,'ref temp','pl+pb',allow,sf

/output,term

eusort

nsel,all
esel,all

!fini
```

APPENDIX B

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

Table 1

TITLE=
MPC-24E Structural Analysis

SUBTITLE 1 =
Component: Fuel Basket
SUBTITLE 2 =
Load Combination: F2.a (See Table 2.1.6)
SUBTITLE 3 =
Stress Result: Primary Membrane (PM)

PRINT ELEMENT TABLE ITEMS PER ELEMENT

| STAT ELEM | CURRENT REF TEMP | CURRENT PM | PREVIOUS ALLOW | PREVIOUS SF |
|---|---|---|---|---|
| 1134 | 725.00 | -10050. | 36950. | 3.6767 |
| 558 | 725.00 | -10049. | 36950. | 3.6770 |
| 1135 | 725.00 | -10024. | 36950. | 3.6863 |
| 559 | 725.00 | -10023. | 36950. | 3.6866 |
| 1136 | 725.00 | -9995.3 | 36950. | 3.6967 |
| 560 | 725.00 | -9994.6 | 36950. | 3.6970 |
| 1137 | 725.00 | -9967.0 | 36950. | 3.7072 |
| 561 | 725.00 | -9966.3 | 36950. | 3.7075 |
| 1138 | 725.00 | -9964.5 | 36950. | 3.7082 |
| 562 | 725.00 | -9963.7 | 36950. | 3.7084 |
| 1139 | 725.00 | -9961.9 | 36950. | 3.7091 |
| 563 | 725.00 | -9961.2 | 36950. | 3.7094 |
| 1140 | 725.00 | -9943.7 | 36950. | 3.7159 |
| 564 | 725.00 | -9943.0 | 36950. | 3.7162 |
| 1017 | 725.00 | -8732.8 | 36950. | 4.2312 |
| 441 | 725.00 | -8732.2 | 36950. | 4.2315 |
| 1016 | 725.00 | -8730.2 | 36950. | 4.2324 |
| 440 | 725.00 | -8729.6 | 36950. | 4.2327 |
| 1015 | 725.00 | -8712.1 | 36950. | 4.2412 |
| 439 | 725.00 | -8711.5 | 36950. | 4.2415 |
| 1014 | 725.00 | -7872.6 | 36950. | 4.6935 |
| 438 | 725.00 | -7872.0 | 36950. | 4.6939 |
| 1013 | 725.00 | -7869.4 | 36950. | 4.6954 |
| 437 | 725.00 | -7868.8 | 36950. | 4.6958 |
| 1012 | 725.00 | -7834.6 | 36950. | 4.7163 |
| 436 | 725.00 | -7834.0 | 36950. | 4.7166 |
| 1011 | 725.00 | -7799.8 | 36950. | 4.7373 |
| 435 | 725.00 | -7799.2 | 36950. | 4.7376 |
| 1010 | 725.00 | -7765.0 | 36950. | 4.7585 |
| 434 | 725.00 | -7764.4 | 36950. | 4.7589 |
| 1009 | 725.00 | -7730.2 | 36950. | 4.7799 |
| 433 | 725.00 | -7729.7 | 36950. | 4.7803 |
| 892 | 725.00 | -6641.7 | 36950. | 5.5634 |
| 316 | 725.00 | -6641.2 | 36950. | 5.5637 |
| 893 | 725.00 | -6638.5 | 36950. | 5.5660 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 317 | 725.00 | -6638.0 | 36950. | 5.5664 |
| 894 | 725.00 | -6603.7 | 36950. | 5.5953 |
| 318 | 725.00 | -6603.3 | 36950. | 5.5957 |
| 895 | 725.00 | -6568.9 | 36950. | 5.6250 |
| 319 | 725.00 | -6568.5 | 36950. | 5.6254 |
| 896 | 725.00 | -6534.1 | 36950. | 5.6549 |
| 320 | 725.00 | -6533.7 | 36950. | 5.6553 |
| 897 | 725.00 | -6499.3 | 36950. | 5.6852 |
| 321 | 725.00 | -6498.9 | 36950. | 5.6856 |
| 898 | 725.00 | -6417.8 | 36950. | 5.7574 |
| 322 | 725.00 | -6417.4 | 36950. | 5.7577 |
| 899 | 725.00 | -6415.2 | 36950. | 5.7597 |
| 323 | 725.00 | -6414.9 | 36950. | 5.7601 |
| 900 | 725.00 | -6397.1 | 36950. | 5.7761 |
| 324 | 725.00 | -6396.7 | 36950. | 5.7764 |
| 1128 | 725.00 | -5990.4 | 36950. | 6.1682 |
| 552 | 725.00 | -5990.3 | 36950. | 6.1683 |
| 1127 | 725.00 | -5987.2 | 36950. | 6.1715 |
| 551 | 725.00 | -5987.1 | 36950. | 6.1716 |
| 1126 | 725.00 | -5952.4 | 36950. | 6.2076 |
| 550 | 725.00 | -5952.3 | 36950. | 6.2077 |
| 1125 | 725.00 | -5917.6 | 36950. | 6.2441 |
| 549 | 725.00 | -5917.5 | 36950. | 6.2442 |
| 1124 | 725.00 | -5882.8 | 36950. | 6.2810 |
| 548 | 725.00 | -5882.7 | 36950. | 6.2811 |
| 1123 | 725.00 | -5848.0 | 36950. | 6.3184 |
| 547 | 725.00 | -5848.0 | 36950. | 6.3184 |
| 442 | 725.00 | -5763.6 | 36950. | 6.4109 |
| 1018 | 725.00 | -5763.6 | 36950. | 6.4109 |
| 443 | 725.00 | -5761.0 | 36950. | 6.4138 |
| 1019 | 725.00 | -5761.0 | 36950. | 6.4138 |
| 444 | 725.00 | -5732.7 | 36950. | 6.4454 |
| 1020 | 725.00 | -5732.7 | 36950. | 6.4455 |
| 445 | 725.00 | -5704.4 | 36950. | 6.4774 |
| 1021 | 725.00 | -5704.4 | 36950. | 6.4774 |
| 499 | 725.00 | -5694.7 | 36950. | 6.4885 |
| 1075 | 725.00 | -5693.2 | 36950. | 6.4902 |
| 500 | 725.00 | -5691.5 | 36950. | 6.4922 |
| 1076 | 725.00 | -5690.1 | 36950. | 6.4938 |
| 446 | 725.00 | -5676.1 | 36950. | 6.5097 |
| 1022 | 725.00 | -5676.1 | 36950. | 6.5097 |
| 501 | 725.00 | -5656.7 | 36950. | 6.5321 |
| 1077 | 725.00 | -5655.3 | 36950. | 6.5337 |
| 447 | 725.00 | -5647.9 | 36950. | 6.5423 |
| 1023 | 725.00 | -5647.8 | 36950. | 6.5423 |
| 448 | 725.00 | -5645.3 | 36950. | 6.5453 |
| 1024 | 725.00 | -5645.2 | 36950. | 6.5453 |
| 449 | 725.00 | -5642.7 | 36950. | 6.5483 |
| 1025 | 725.00 | -5642.7 | 36950. | 6.5483 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 450 | 725.00 | -5624.6 | 36950. | 6.5694 |
| 1026 | 725.00 | -5624.5 | 36950. | 6.5694 |
| 502 | 725.00 | -5621.9 | 36950. | 6.5725 |
| 1078 | 725.00 | -5620.5 | 36950. | 6.5742 |
| 503 | 725.00 | -5587.1 | 36950. | 6.6134 |
| 1079 | 725.00 | -5585.7 | 36950. | 6.6151 |
| 504 | 725.00 | -5547.5 | 36950. | 6.6606 |
| 1080 | 725.00 | -5546.1 | 36950. | 6.6624 |
| 505 | 725.00 | -5480.4 | 36950. | 6.7422 |
| 1081 | 725.00 | -5479.0 | 36950. | 6.7439 |
| 506 | 725.00 | -5477.8 | 36950. | 6.7454 |
| 1082 | 725.00 | -5476.4 | 36950. | 6.7471 |
| 507 | 725.00 | -5463.6 | 36950. | 6.7630 |
| 1083 | 725.00 | -5462.2 | 36950. | 6.7647 |
| 1168 | 725.00 | -5402.0 | 36950. | 6.8400 |
| 1156 | 725.00 | -5401.7 | 36950. | 6.8404 |
| 1169 | 725.00 | -5399.4 | 36950. | 6.8433 |
| 1157 | 725.00 | -5399.1 | 36950. | 6.8437 |
| 1170 | 725.00 | -5381.3 | 36950. | 6.8664 |
| 1158 | 725.00 | -5381.0 | 36950. | 6.8667 |
| 315 | 725.00 | -4740.8 | 36950. | 7.7941 |
| 891 | 725.00 | -4740.7 | 36950. | 7.7941 |
| 314 | 725.00 | -4738.2 | 36950. | 7.7983 |
| 890 | 725.00 | -4738.2 | 36950. | 7.7984 |
| 313 | 725.00 | -4720.1 | 36950. | 7.8283 |
| 889 | 725.00 | -4720.0 | 36950. | 7.8283 |
| 612 | 725.00 | -4413.4 | 36950. | 8.3722 |
| 36 | 725.00 | -4413.2 | 36950. | 8.3726 |
| 611 | 725.00 | -4410.8 | 36950. | 8.3771 |
| 35 | 725.00 | -4410.6 | 36950. | 8.3775 |
| 354 | 725.00 | -4395.2 | 36950. | 8.4069 |
| 930 | 725.00 | -4394.1 | 36950. | 8.4090 |
| 610 | 725.00 | -4392.7 | 36950. | 8.4117 |
| 353 | 725.00 | -4392.6 | 36950. | 8.4119 |
| 34 | 725.00 | -4392.5 | 36950. | 8.4121 |
| 929 | 725.00 | -4391.5 | 36950. | 8.4139 |
| 352 | 725.00 | -4374.5 | 36950. | 8.4468 |
| 928 | 725.00 | -4373.4 | 36950. | 8.4488 |
| 312 | 725.00 | -3871.2 | 36950. | 9.5448 |
| 888 | 725.00 | -3871.2 | 36950. | 9.5449 |
| 311 | 725.00 | -3868.0 | 36950. | 9.5526 |
| 887 | 725.00 | -3868.0 | 36950. | 9.5527 |
| 310 | 725.00 | -3833.3 | 36950. | 9.6393 |
| 886 | 725.00 | -3833.2 | 36950. | 9.6394 |
| 309 | 725.00 | -3798.5 | 36950. | 9.7276 |
| 885 | 725.00 | -3798.4 | 36950. | 9.7277 |
| 308 | 725.00 | -3763.7 | 36950. | 9.8175 |
| 884 | 725.00 | -3763.6 | 36950. | 9.8176 |
| 307 | 725.00 | -3728.9 | 36950. | 9.9091 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 883 | 725.00 | -3728.9 | 36950. | 9.9092 |
| 351 | 725.00 | -3590.5 | 36950. | 10.291 |
| 927 | 725.00 | -3589.5 | 36950. | 10.294 |
| 350 | 725.00 | -3587.3 | 36950. | 10.300 |
| 926 | 725.00 | -3586.3 | 36950. | 10.303 |
| 1165 | 725.00 | -3562.5 | 36950. | 10.372 |
| 1153 | 725.00 | -3562.4 | 36950. | 10.372 |
| 1166 | 725.00 | -3559.9 | 36950. | 10.379 |
| 1154 | 725.00 | -3559.9 | 36950. | 10.380 |
| 349 | 725.00 | -3552.5 | 36950. | 10.401 |
| 609 | 725.00 | -3552.1 | 36950. | 10.402 |
| 33 | 725.00 | -3551.9 | 36950. | 10.403 |
| 925 | 725.00 | -3551.5 | 36950. | 10.404 |
| 608 | 725.00 | -3548.9 | 36950. | 10.412 |
| 32 | 725.00 | -3548.8 | 36950. | 10.412 |
| 1167 | 725.00 | -3541.8 | 36950. | 10.433 |
| 1155 | 725.00 | -3541.7 | 36950. | 10.433 |
| 348 | 725.00 | -3517.7 | 36950. | 10.504 |
| 924 | 725.00 | -3516.8 | 36950. | 10.507 |
| 607 | 725.00 | -3514.1 | 36950. | 10.515 |
| 31 | 725.00 | -3514.0 | 36950. | 10.515 |
| 347 | 725.00 | -3482.9 | 36950. | 10.609 |
| 923 | 725.00 | -3482.0 | 36950. | 10.612 |
| 606 | 725.00 | -3479.3 | 36950. | 10.620 |
| 30 | 725.00 | -3479.2 | 36950. | 10.620 |
| 346 | 725.00 | -3448.1 | 36950. | 10.716 |
| 922 | 725.00 | -3447.2 | 36950. | 10.719 |
| 605 | 725.00 | -3444.5 | 36950. | 10.727 |
| 29 | 725.00 | -3444.4 | 36950. | 10.728 |
| 604 | 725.00 | -3409.7 | 36950. | 10.837 |
| 28 | 725.00 | -3409.6 | 36950. | 10.837 |
| 1159 | 725.00 | -3320.0 | 36950. | 11.129 |
| 1171 | 725.00 | -3319.3 | 36950. | 11.132 |
| 1160 | 725.00 | -3317.4 | 36950. | 11.138 |
| 1172 | 725.00 | -3316.7 | 36950. | 11.141 |
| 1161 | 725.00 | -3299.3 | 36950. | 11.199 |
| 1173 | 725.00 | -3298.6 | 36950. | 11.202 |
| 595 | 725.00 | -2607.0 | 36950. | 14.173 |
| 19 | 725.00 | -2606.9 | 36950. | 14.174 |
| 596 | 725.00 | -2603.8 | 36950. | 14.191 |
| 20 | 725.00 | -2603.7 | 36950. | 14.191 |
| 597 | 725.00 | -2569.1 | 36950. | 14.383 |
| 21 | 725.00 | -2568.9 | 36950. | 14.384 |
| 598 | 725.00 | -2534.3 | 36950. | 14.580 |
| 22 | 725.00 | -2534.1 | 36950. | 14.581 |
| 599 | 725.00 | -2499.5 | 36950. | 14.783 |
| 23 | 725.00 | -2499.3 | 36950. | 14.784 |
| 600 | 725.00 | -2464.7 | 36950. | 14.992 |
| 24 | 725.00 | -2464.5 | 36950. | 14.993 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 58 | 725.00 | -2412.1 | 36950. | 15.318 |
| 634 | 725.00 | -2411.7 | 36950. | 15.321 |
| 59 | 725.00 | -2409.0 | 36950. | 15.339 |
| 635 | 725.00 | -2408.5 | 36950. | 15.342 |
| 601 | 725.00 | -2388.7 | 36950. | 15.469 |
| 25 | 725.00 | -2388.5 | 36950. | 15.470 |
| 602 | 725.00 | -2386.1 | 36950. | 15.486 |
| 26 | 725.00 | -2385.9 | 36950. | 15.487 |
| 60 | 725.00 | -2374.2 | 36950. | 15.563 |
| 636 | 725.00 | -2373.7 | 36950. | 15.566 |
| 603 | 725.00 | -2368.0 | 36950. | 15.604 |
| 27 | 725.00 | -2367.8 | 36950. | 15.605 |
| 61 | 725.00 | -2339.4 | 36950. | 15.795 |
| 637 | 725.00 | -2338.9 | 36950. | 15.798 |
| 721 | 725.00 | -2326.9 | 36950. | 15.880 |
| 145 | 725.00 | -2326.9 | 36950. | 15.880 |
| 722 | 725.00 | -2323.7 | 36950. | 15.901 |
| 146 | 725.00 | -2323.7 | 36950. | 15.901 |
| 62 | 725.00 | -2304.6 | 36950. | 16.033 |
| 638 | 725.00 | -2304.1 | 36950. | 16.037 |
| 723 | 725.00 | -2288.9 | 36950. | 16.143 |
| 147 | 725.00 | -2288.9 | 36950. | 16.143 |
| 63 | 725.00 | -2269.8 | 36950. | 16.279 |
| 639 | 725.00 | -2269.3 | 36950. | 16.282 |
| 724 | 725.00 | -2254.1 | 36950. | 16.392 |
| 148 | 725.00 | -2254.1 | 36950. | 16.392 |
| 725 | 725.00 | -2219.4 | 36950. | 16.649 |
| 149 | 725.00 | -2219.3 | 36950. | 16.649 |
| 726 | 725.00 | -2184.6 | 36950. | 16.914 |
| 150 | 725.00 | -2184.6 | 36950. | 16.914 |
| 64 | 725.00 | -2175.3 | 36950. | 16.986 |
| 640 | 725.00 | -2174.9 | 36950. | 16.989 |
| 65 | 725.00 | -2172.7 | 36950. | 17.007 |
| 641 | 725.00 | -2172.3 | 36950. | 17.010 |
| 66 | 725.00 | -2154.5 | 36950. | 17.150 |
| 642 | 725.00 | -2154.2 | 36950. | 17.153 |
| 151 | 725.00 | -2117.0 | 36950. | 17.454 |
| 727 | 725.00 | -2117.0 | 36950. | 17.454 |
| 152 | 725.00 | -2114.4 | 36950. | 17.475 |
| 728 | 725.00 | -2114.4 | 36950. | 17.475 |
| 153 | 725.00 | -2096.3 | 36950. | 17.627 |
| 729 | 725.00 | -2096.3 | 36950. | 17.627 |
| 738 | 725.00 | -1395.8 | 36950. | 26.473 |
| 162 | 725.00 | -1395.6 | 36950. | 26.476 |
| 737 | 725.00 | -1393.2 | 36950. | 26.522 |
| 161 | 725.00 | -1393.0 | 36950. | 26.525 |
| 736 | 725.00 | -1375.0 | 36950. | 26.872 |
| 160 | 725.00 | -1374.9 | 36950. | 26.875 |
| 735 | 725.00 | -1372.5 | 36950. | 26.922 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 159 | 725.00 | -1372.3 | 36950. | 26.926 |
| 734 | 725.00 | -1369.9 | 36950. | 26.973 |
| 158 | 725.00 | -1369.7 | 36950. | 26.977 |
| 733 | 725.00 | -1341.6 | 36950. | 27.542 |
| 157 | 725.00 | -1341.4 | 36950. | 27.546 |
| 732 | 725.00 | -1313.3 | 36950. | 28.135 |
| 156 | 725.00 | -1313.1 | 36950. | 28.139 |
| 731 | 725.00 | -1285.0 | 36950. | 28.755 |
| 155 | 725.00 | -1284.8 | 36950. | 28.759 |
| 730 | 725.00 | -1256.7 | 36950. | 29.402 |
| 154 | 725.00 | -1256.5 | 36950. | 29.406 |
| 1008 | 725.00 | -1219.7 | 36950. | 30.293 |
| 432 | 725.00 | -1219.2 | 36950. | 30.306 |
| 1007 | 725.00 | -1191.3 | 36950. | 31.017 |
| 431 | 725.00 | -1190.8 | 36950. | 31.031 |
| 1006 | 725.00 | -1162.8 | 36950. | 31.777 |
| 430 | 725.00 | -1162.3 | 36950. | 31.791 |
| 219 | 725.00 | -1155.5 | 36950. | 31.978 |
| 795 | 725.00 | -1155.4 | 36950. | 31.980 |
| 218 | 725.00 | -1152.9 | 36950. | 32.049 |
| 794 | 725.00 | -1152.8 | 36950. | 32.052 |
| 217 | 725.00 | -1138.7 | 36950. | 32.450 |
| 793 | 725.00 | -1138.6 | 36950. | 32.452 |
| 1005 | 725.00 | -1134.3 | 36950. | 32.574 |
| 429 | 725.00 | -1133.8 | 36950. | 32.589 |
| 1004 | 725.00 | -1105.9 | 36950. | 33.413 |
| 428 | 725.00 | -1105.4 | 36950. | 33.428 |
| 1003 | 725.00 | -1077.4 | 36950. | 34.295 |
| 427 | 725.00 | -1076.9 | 36950. | 34.312 |
| 1174 | 725.00 | -1002.3 | 36950. | 36.867 |
| 1162 | 725.00 | -1001.9 | 36950. | 36.880 |
| 1175 | 725.00 | -999.68 | 36950. | 36.962 |
| 1163 | 725.00 | -999.31 | 36950. | 36.975 |
| 1176 | 725.00 | -981.54 | 36950. | 37.645 |
| 1164 | 725.00 | -981.18 | 36950. | 37.659 |
| 811 | 725.00 | 927.83 | 36950. | 39.824 |
| 235 | 725.00 | 927.76 | 36950. | 39.827 |
| 812 | 725.00 | 924.65 | 36950. | 39.961 |
| 236 | 725.00 | 924.59 | 36950. | 39.964 |
| 813 | 725.00 | 896.18 | 36950. | 41.230 |
| 237 | 725.00 | 896.12 | 36950. | 41.233 |
| 469 | 725.00 | 895.12 | 36950. | 41.280 |
| 1045 | 725.00 | 895.09 | 36950. | 41.281 |
| 85 | 725.00 | 894.07 | 36950. | 41.328 |
| 661 | 725.00 | 893.99 | 36950. | 41.332 |
| 470 | 725.00 | 891.94 | 36950. | 41.427 |
| 1046 | 725.00 | 891.91 | 36950. | 41.428 |
| 86 | 725.00 | 890.90 | 36950. | 41.475 |
| 662 | 725.00 | 890.81 | 36950. | 41.479 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 331 | 725.00 | 885.77 | 36950. | 41.715 |
| 907 | 725.00 | 885.76 | 36950. | 41.715 |
| 332 | 725.00 | 882.59 | 36950. | 41.865 |
| 908 | 725.00 | 882.59 | 36950. | 41.866 |
| 814 | 725.00 | 867.72 | 36950. | 42.583 |
| 238 | 725.00 | 867.65 | 36950. | 42.586 |
| 471 | 725.00 | 863.47 | 36950. | 42.792 |
| 1047 | 725.00 | 863.45 | 36950. | 42.794 |
| 87 | 725.00 | 862.43 | 36950. | 42.844 |
| 663 | 725.00 | 862.34 | 36950. | 42.848 |
| 333 | 725.00 | 854.12 | 36950. | 43.261 |
| 909 | 725.00 | 854.12 | 36950. | 43.261 |
| 815 | 725.00 | 839.25 | 36950. | 44.027 |
| 239 | 725.00 | 839.19 | 36950. | 44.031 |
| 472 | 725.00 | 835.01 | 36950. | 44.251 |
| 1048 | 725.00 | 834.98 | 36950. | 44.252 |
| 88 | 725.00 | 833.96 | 36950. | 44.307 |
| 664 | 725.00 | 833.88 | 36950. | 44.311 |
| 334 | 725.00 | 825.66 | 36950. | 44.752 |
| 910 | 725.00 | 825.65 | 36950. | 44.752 |
| 816 | 725.00 | 810.78 | 36950. | 45.573 |
| 240 | 725.00 | 810.72 | 36950. | 45.577 |
| 473 | 725.00 | 806.54 | 36950. | 45.813 |
| 1049 | 725.00 | 806.52 | 36950. | 45.814 |
| 89 | 725.00 | 805.50 | 36950. | 45.872 |
| 665 | 725.00 | 805.41 | 36950. | 45.877 |
| 335 | 725.00 | 797.19 | 36950. | 46.350 |
| 911 | 725.00 | 797.19 | 36950. | 46.351 |
| 474 | 725.00 | 778.07 | 36950. | 47.489 |
| 1050 | 725.00 | 778.05 | 36950. | 47.491 |
| 90 | 725.00 | 777.03 | 36950. | 47.553 |
| 666 | 725.00 | 776.94 | 36950. | 47.558 |
| 336 | 725.00 | 768.73 | 36950. | 48.067 |
| 912 | 725.00 | 768.72 | 36950. | 48.067 |
| 276 | 725.00 | -662.89 | 36950. | 55.741 |
| 852 | 725.00 | -662.72 | 36950. | 55.755 |
| 275 | 725.00 | -660.30 | 36950. | 55.959 |
| 851 | 725.00 | -660.13 | 36950. | 55.974 |
| 274 | 725.00 | -642.17 | 36950. | 57.539 |
| 850 | 725.00 | -642.00 | 36950. | 57.555 |
| 273 | 725.00 | -639.58 | 36950. | 57.772 |
| 849 | 725.00 | -639.41 | 36950. | 57.787 |
| 272 | 725.00 | -637.00 | 36950. | 58.006 |
| 848 | 725.00 | -636.83 | 36950. | 58.022 |
| 271 | 725.00 | -608.71 | 36950. | 60.702 |
| 847 | 725.00 | -608.54 | 36950. | 60.719 |
| 270 | 725.00 | -580.41 | 36950. | 63.662 |
| 846 | 725.00 | -580.24 | 36950. | 63.680 |
| 1152 | 725.00 | -559.88 | 36950. | 65.996 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 576 | 725.00 | -559.80 | 36950. | 66.006 |
| 872 | 725.00 | 465.85 | 36950. | 79.317 |
| 871 | 725.00 | 465.85 | 36950. | 79.317 |
| 873 | 725.00 | 465.85 | 36950. | 79.317 |
| 296 | 725.00 | 465.80 | 36950. | 79.327 |
| 295 | 725.00 | 465.80 | 36950. | 79.327 |
| 297 | 725.00 | 465.80 | 36950. | 79.327 |
| 1230 | 725.00 | 424.39 | 36950. | 87.067 |
| 1225 | 725.00 | 424.34 | 36950. | 87.077 |
| 584 | 725.00 | -402.30 | 36950. | 91.846 |
| 583 | 725.00 | -402.30 | 36950. | 91.846 |
| 585 | 725.00 | -402.30 | 36950. | 91.846 |
| 9 | 725.00 | -402.25 | 36950. | 91.859 |
| 8 | 725.00 | -402.25 | 36950. | 91.859 |
| 7 | 725.00 | -402.25 | 36950. | 91.859 |
| 1229 | 725.00 | 391.81 | 36950. | 94.305 |
| 1224 | 725.00 | 391.76 | 36950. | 94.317 |
| 835 | 725.00 | -382.08 | 36950. | 96.708 |
| 259 | 725.00 | -381.98 | 36950. | 96.733 |
| 836 | 725.00 | -378.90 | 36950. | 97.519 |
| 260 | 725.00 | -378.80 | 36950. | 97.545 |
| 966 | 725.00 | 374.91 | 36950. | 98.558 |
| 964 | 725.00 | 374.91 | 36950. | 98.558 |
| 963 | 725.00 | 374.91 | 36950. | 98.558 |
| 962 | 725.00 | 374.91 | 36950. | 98.558 |
| 965 | 725.00 | 374.91 | 36950. | 98.558 |
| 961 | 725.00 | 374.91 | 36950. | 98.558 |
| 386 | 725.00 | 374.50 | 36950. | 98.664 |
| 389 | 725.00 | 374.50 | 36950. | 98.664 |
| 388 | 725.00 | 374.50 | 36950. | 98.664 |
| 387 | 725.00 | 374.50 | 36950. | 98.664 |
| 385 | 725.00 | 374.50 | 36950. | 98.664 |
| 390 | 725.00 | 374.50 | 36950. | 98.664 |
| 678 | 725.00 | -374.14 | 36950. | 98.759 |
| 677 | 725.00 | -374.14 | 36950. | 98.759 |
| 674 | 725.00 | -374.14 | 36950. | 98.759 |
| 675 | 725.00 | -374.14 | 36950. | 98.759 |
| 676 | 725.00 | -374.14 | 36950. | 98.759 |
| 673 | 725.00 | -374.14 | 36950. | 98.759 |
| 102 | 725.00 | -373.74 | 36950. | 98.866 |
| 101 | 725.00 | -373.74 | 36950. | 98.866 |
| 98 | 725.00 | -373.74 | 36950. | 98.866 |
| 100 | 725.00 | -373.74 | 36950. | 98.866 |
| 99 | 725.00 | -373.74 | 36950. | 98.866 |
| 97 | 725.00 | -373.74 | 36950. | 98.866 |
| 975 | 725.00 | 371.93 | 36950. | 99.346 |
| 972 | 725.00 | 371.93 | 36950. | 99.346 |
| 973 | 725.00 | 371.93 | 36950. | 99.346 |
| 977 | 725.00 | 371.93 | 36950. | 99.346 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 974 | 725.00 | 371.93 | 36950. | 99.346 |
| 978 | 725.00 | 371.93 | 36950. | 99.346 |
| 976 | 725.00 | 371.93 | 36950. | 99.346 |
| 401 | 725.00 | 371.58 | 36950. | 99.440 |
| 396 | 725.00 | 371.58 | 36950. | 99.440 |
| 397 | 725.00 | 371.58 | 36950. | 99.440 |
| 398 | 725.00 | 371.58 | 36950. | 99.440 |
| 400 | 725.00 | 371.58 | 36950. | 99.440 |
| 399 | 725.00 | 371.58 | 36950. | 99.440 |
| 402 | 725.00 | 371.58 | 36950. | 99.440 |
| 1228 | 725.00 | 359.24 | 36950. | 102.86 |
| 1223 | 725.00 | 359.19 | 36950. | 102.87 |
| 870 | 725.00 | 352.50 | 36950. | 104.82 |
| 869 | 725.00 | 352.50 | 36950. | 104.82 |
| 867 | 725.00 | 352.50 | 36950. | 104.82 |
| 868 | 725.00 | 352.50 | 36950. | 104.82 |
| 866 | 725.00 | 352.50 | 36950. | 104.82 |
| 865 | 725.00 | 352.50 | 36950. | 104.82 |
| 294 | 725.00 | 352.44 | 36950. | 104.84 |
| 292 | 725.00 | 352.44 | 36950. | 104.84 |
| 293 | 725.00 | 352.44 | 36950. | 104.84 |
| 291 | 725.00 | 352.44 | 36950. | 104.84 |
| 290 | 725.00 | 352.44 | 36950. | 104.84 |
| 289 | 725.00 | 352.44 | 36950. | 104.84 |
| 837 | 725.00 | -344.11 | 36950. | 107.38 |
| 261 | 725.00 | -344.01 | 36950. | 107.41 |
| 577 | 725.00 | -335.80 | 36950. | 110.04 |
| 581 | 725.00 | -335.80 | 36950. | 110.04 |
| 580 | 725.00 | -335.80 | 36950. | 110.04 |
| 579 | 725.00 | -335.80 | 36950. | 110.04 |
| 578 | 725.00 | -335.80 | 36950. | 110.04 |
| 582 | 725.00 | -335.80 | 36950. | 110.04 |
| 6 | 725.00 | -335.73 | 36950. | 110.06 |
| 1 | 725.00 | -335.73 | 36950. | 110.06 |
| 2 | 725.00 | -335.73 | 36950. | 110.06 |
| 3 | 725.00 | -335.73 | 36950. | 110.06 |
| 4 | 725.00 | -335.73 | 36950. | 110.06 |
| 5 | 725.00 | -335.73 | 36950. | 110.06 |
| 1227 | 725.00 | 326.67 | 36950. | 113.11 |
| 1222 | 725.00 | 326.62 | 36950. | 113.13 |
| 997 | 725.00 | -316.56 | 36950. | 116.72 |
| 1213 | 725.00 | -316.56 | 36950. | 116.72 |
| 1212 | 725.00 | -316.56 | 36950. | 116.72 |
| 1215 | 725.00 | -316.56 | 36950. | 116.72 |
| 1214 | 725.00 | -316.56 | 36950. | 116.72 |
| 421 | 725.00 | -316.28 | 36950. | 116.83 |
| 1203 | 725.00 | -316.28 | 36950. | 116.83 |
| 1205 | 725.00 | -316.28 | 36950. | 116.83 |
| 1204 | 725.00 | -316.28 | 36950. | 116.83 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1202 | 725.00 | -316.28 | 36950. | 116.83 |
| 838 | 725.00 | -309.32 | 36950. | 119.45 |
| 262 | 725.00 | -309.22 | 36950. | 119.49 |
| 283 | 725.00 | 294.09 | 36950. | 125.64 |
| 859 | 725.00 | 294.05 | 36950. | 125.66 |
| 133 | 725.00 | -280.66 | 36950. | 131.66 |
| 1209 | 725.00 | -280.66 | 36950. | 131.66 |
| 1208 | 725.00 | -280.66 | 36950. | 131.66 |
| 1207 | 725.00 | -280.66 | 36950. | 131.66 |
| 1210 | 725.00 | -280.66 | 36950. | 131.66 |
| 1219 | 725.00 | -280.38 | 36950. | 131.79 |
| 1217 | 725.00 | -280.38 | 36950. | 131.79 |
| 1218 | 725.00 | -280.38 | 36950. | 131.79 |
| 1220 | 725.00 | -280.38 | 36950. | 131.79 |
| 709 | 725.00 | -280.38 | 36950. | 131.79 |
| 216 | 725.00 | -274.55 | 36950. | 134.59 |
| 839 | 725.00 | -274.53 | 36950. | 134.59 |
| 792 | 725.00 | -274.51 | 36950. | 134.60 |
| 263 | 725.00 | -274.43 | 36950. | 134.64 |
| 215 | 725.00 | -271.37 | 36950. | 136.16 |
| 791 | 725.00 | -271.33 | 36950. | 136.18 |
| 1181 | 725.00 | -247.90 | 36950. | 149.05 |
| 1180 | 725.00 | -247.90 | 36950. | 149.05 |
| 1182 | 725.00 | -247.90 | 36950. | 149.05 |
| 840 | 725.00 | -239.74 | 36950. | 154.12 |
| 264 | 725.00 | -239.65 | 36950. | 154.19 |
| 1099 | 725.00 | -236.76 | 36950. | 156.07 |
| 523 | 725.00 | -236.69 | 36950. | 156.11 |
| 1100 | 725.00 | -233.58 | 36950. | 158.19 |
| 524 | 725.00 | -233.52 | 36950. | 158.23 |
| 214 | 725.00 | -231.76 | 36950. | 159.43 |
| 790 | 725.00 | -231.73 | 36950. | 159.45 |
| 114 | 725.00 | 227.59 | 36950. | 162.35 |
| 108 | 725.00 | 227.59 | 36950. | 162.35 |
| 110 | 725.00 | 227.59 | 36950. | 162.35 |
| 109 | 725.00 | 227.59 | 36950. | 162.35 |
| 113 | 725.00 | 227.59 | 36950. | 162.35 |
| 111 | 725.00 | 227.59 | 36950. | 162.35 |
| 112 | 725.00 | 227.59 | 36950. | 162.35 |
| 690 | 725.00 | 227.24 | 36950. | 162.60 |
| 685 | 725.00 | 227.24 | 36950. | 162.60 |
| 684 | 725.00 | 227.24 | 36950. | 162.60 |
| 686 | 725.00 | 227.24 | 36950. | 162.60 |
| 689 | 725.00 | 227.24 | 36950. | 162.60 |
| 687 | 725.00 | 227.24 | 36950. | 162.60 |
| 688 | 725.00 | 227.24 | 36950. | 162.60 |
| 181 | 725.00 | -226.63 | 36950. | 163.04 |
| 757 | 725.00 | -226.61 | 36950. | 163.06 |
| 1184 | 725.00 | 223.86 | 36950. | 165.06 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1185 | 725.00 | 223.86 | 36950. | 165.06 |
| 1183 | 725.00 | 223.86 | 36950. | 165.06 |
| 182 | 725.00 | -223.45 | 36950. | 165.36 |
| 758 | 725.00 | -223.43 | 36950. | 165.38 |
| 43 | 725.00 | -218.19 | 36950. | 169.35 |
| 619 | 725.00 | -218.19 | 36950. | 169.35 |
| 44 | 725.00 | -215.01 | 36950. | 171.85 |
| 620 | 725.00 | -215.01 | 36950. | 171.85 |
| 373 | 725.00 | -212.76 | 36950. | 173.67 |
| 949 | 725.00 | -212.67 | 36950. | 173.74 |
| 374 | 725.00 | -209.58 | 36950. | 176.30 |
| 950 | 725.00 | -209.49 | 36950. | 176.38 |
| 753 | 725.00 | 205.54 | 36950. | 179.77 |
| 751 | 725.00 | 205.54 | 36950. | 179.77 |
| 750 | 725.00 | 205.54 | 36950. | 179.77 |
| 749 | 725.00 | 205.54 | 36950. | 179.77 |
| 752 | 725.00 | 205.54 | 36950. | 179.77 |
| 748 | 725.00 | 205.54 | 36950. | 179.77 |
| 172 | 725.00 | 205.53 | 36950. | 179.78 |
| 176 | 725.00 | 205.53 | 36950. | 179.78 |
| 173 | 725.00 | 205.53 | 36950. | 179.78 |
| 174 | 725.00 | 205.53 | 36950. | 179.78 |
| 175 | 725.00 | 205.53 | 36950. | 179.78 |
| 177 | 725.00 | 205.53 | 36950. | 179.78 |
| 1101 | 725.00 | -205.11 | 36950. | 180.14 |
| 525 | 725.00 | -205.05 | 36950. | 180.20 |
| 213 | 725.00 | -196.97 | 36950. | 187.59 |
| 789 | 725.00 | -196.94 | 36950. | 187.62 |
| 715 | 725.00 | -195.03 | 36950. | 189.46 |
| 183 | 725.00 | -194.98 | 36950. | 189.50 |
| 759 | 725.00 | -194.96 | 36950. | 189.52 |
| 139 | 725.00 | -194.82 | 36950. | 189.66 |
| 716 | 725.00 | -191.85 | 36950. | 192.60 |
| 140 | 725.00 | -191.64 | 36950. | 192.81 |
| 45 | 725.00 | -186.55 | 36950. | 198.07 |
| 621 | 725.00 | -186.54 | 36950. | 198.08 |
| 593 | 725.00 | -184.83 | 36950. | 199.91 |
| 594 | 725.00 | -184.83 | 36950. | 199.91 |
| 592 | 725.00 | -184.83 | 36950. | 199.91 |
| 17 | 725.00 | -184.80 | 36950. | 199.95 |
| 16 | 725.00 | -184.80 | 36950. | 199.95 |
| 18 | 725.00 | -184.80 | 36950. | 199.95 |
| 375 | 725.00 | -181.11 | 36950. | 204.01 |
| 951 | 725.00 | -181.03 | 36950. | 204.11 |
| 644 | 725.00 | -180.05 | 36950. | 205.22 |
| 646 | 725.00 | -180.05 | 36950. | 205.22 |
| 648 | 725.00 | -180.05 | 36950. | 205.22 |
| 643 | 725.00 | -180.05 | 36950. | 205.22 |
| 645 | 725.00 | -180.05 | 36950. | 205.22 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 647 | 725.00 | -180.05 | 36950. | 205.22 |
| 72 | 725.00 | -179.94 | 36950. | 205.35 |
| 71 | 725.00 | -179.94 | 36950. | 205.35 |
| 69 | 725.00 | -179.94 | 36950. | 205.35 |
| 68 | 725.00 | -179.94 | 36950. | 205.35 |
| 70 | 725.00 | -179.94 | 36950. | 205.35 |
| 67 | 725.00 | -179.94 | 36950. | 205.35 |
| 1102 | 725.00 | -176.65 | 36950. | 209.17 |
| 526 | 725.00 | -176.58 | 36950. | 209.25 |
| 184 | 725.00 | -166.52 | 36950. | 221.90 |
| 760 | 725.00 | -166.49 | 36950. | 221.93 |
| 717 | 725.00 | -163.38 | 36950. | 226.16 |
| 141 | 725.00 | -163.18 | 36950. | 226.44 |
| 212 | 725.00 | -162.19 | 36950. | 227.82 |
| 788 | 725.00 | -162.15 | 36950. | 227.87 |
| 1194 | 725.00 | 158.22 | 36950. | 233.54 |
| 1193 | 725.00 | 158.22 | 36950. | 233.54 |
| 1192 | 725.00 | 158.22 | 36950. | 233.54 |
| 46 | 725.00 | -158.08 | 36950. | 233.74 |
| 622 | 725.00 | -158.08 | 36950. | 233.75 |
| 481 | 725.00 | 154.93 | 36950. | 238.50 |
| 486 | 725.00 | 154.93 | 36950. | 238.50 |
| 483 | 725.00 | 154.93 | 36950. | 238.50 |
| 482 | 725.00 | 154.93 | 36950. | 238.50 |
| 484 | 725.00 | 154.93 | 36950. | 238.50 |
| 485 | 725.00 | 154.93 | 36950. | 238.50 |
| 1059 | 725.00 | 154.91 | 36950. | 238.52 |
| 1057 | 725.00 | 154.91 | 36950. | 238.52 |
| 1062 | 725.00 | 154.91 | 36950. | 238.52 |
| 1060 | 725.00 | 154.91 | 36950. | 238.52 |
| 1058 | 725.00 | 154.91 | 36950. | 238.52 |
| 1061 | 725.00 | 154.91 | 36950. | 238.52 |
| 277 | 725.00 | -152.97 | 36950. | 241.56 |
| 278 | 725.00 | -152.97 | 36950. | 241.56 |
| 280 | 725.00 | -152.97 | 36950. | 241.56 |
| 279 | 725.00 | -152.97 | 36950. | 241.56 |
| 281 | 725.00 | -152.97 | 36950. | 241.56 |
| 282 | 725.00 | -152.97 | 36950. | 241.56 |
| 857 | 725.00 | -152.96 | 36950. | 241.57 |
| 858 | 725.00 | -152.96 | 36950. | 241.57 |
| 853 | 725.00 | -152.96 | 36950. | 241.57 |
| 854 | 725.00 | -152.96 | 36950. | 241.57 |
| 856 | 725.00 | -152.96 | 36950. | 241.57 |
| 855 | 725.00 | -152.96 | 36950. | 241.57 |
| 376 | 725.00 | -152.65 | 36950. | 242.06 |
| 952 | 725.00 | -152.56 | 36950. | 242.20 |
| 1103 | 725.00 | -148.18 | 36950. | 249.36 |
| 527 | 725.00 | -148.12 | 36950. | 249.46 |
| 185 | 725.00 | -138.05 | 36950. | 267.66 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 761 | 725.00 | -138.03 | 36950. | 267.70 |
| 882 | 725.00 | 136.56 | 36950. | 270.57 |
| 880 | 725.00 | 136.56 | 36950. | 270.57 |
| 881 | 725.00 | 136.56 | 36950. | 270.57 |
| 304 | 725.00 | 136.52 | 36950. | 270.65 |
| 305 | 725.00 | 136.52 | 36950. | 270.65 |
| 306 | 725.00 | 136.52 | 36950. | 270.65 |
| 477 | 725.00 | 135.36 | 36950. | 272.97 |
| 478 | 725.00 | 135.36 | 36950. | 272.97 |
| 476 | 725.00 | 135.36 | 36950. | 272.97 |
| 479 | 725.00 | 135.36 | 36950. | 272.97 |
| 475 | 725.00 | 135.36 | 36950. | 272.97 |
| 480 | 725.00 | 135.36 | 36950. | 272.97 |
| 1052 | 725.00 | 135.34 | 36950. | 273.02 |
| 1055 | 725.00 | 135.34 | 36950. | 273.02 |
| 1053 | 725.00 | 135.34 | 36950. | 273.02 |
| 1054 | 725.00 | 135.34 | 36950. | 273.02 |
| 1056 | 725.00 | 135.34 | 36950. | 273.02 |
| 1051 | 725.00 | 135.34 | 36950. | 273.02 |
| 718 | 725.00 | -134.91 | 36950. | 273.88 |
| 142 | 725.00 | -134.71 | 36950. | 274.29 |
| 47 | 725.00 | -129.61 | 36950. | 285.08 |
| 623 | 725.00 | -129.61 | 36950. | 285.09 |
| 91 | 725.00 | 129.32 | 36950. | 285.72 |
| 94 | 725.00 | 129.32 | 36950. | 285.72 |
| 95 | 725.00 | 129.32 | 36950. | 285.72 |
| 96 | 725.00 | 129.32 | 36950. | 285.72 |
| 93 | 725.00 | 129.32 | 36950. | 285.72 |
| 92 | 725.00 | 129.32 | 36950. | 285.72 |
| 668 | 725.00 | 129.25 | 36950. | 285.87 |
| 670 | 725.00 | 129.25 | 36950. | 285.87 |
| 672 | 725.00 | 129.25 | 36950. | 285.87 |
| 669 | 725.00 | 129.25 | 36950. | 285.87 |
| 667 | 725.00 | 129.25 | 36950. | 285.87 |
| 671 | 725.00 | 129.25 | 36950. | 285.87 |
| 211 | 725.00 | -127.40 | 36950. | 290.04 |
| 787 | 725.00 | -127.36 | 36950. | 290.12 |
| 377 | 725.00 | -124.18 | 36950. | 297.55 |
| 953 | 725.00 | -124.09 | 36950. | 297.76 |
| 807 | 725.00 | 123.19 | 36950. | 299.93 |
| 810 | 725.00 | 123.19 | 36950. | 299.93 |
| 808 | 725.00 | 123.19 | 36950. | 299.93 |
| 809 | 725.00 | 123.19 | 36950. | 299.93 |
| 806 | 725.00 | 123.19 | 36950. | 299.93 |
| 805 | 725.00 | 123.19 | 36950. | 299.93 |
| 232 | 725.00 | 123.16 | 36950. | 300.02 |
| 234 | 725.00 | 123.16 | 36950. | 300.02 |
| 233 | 725.00 | 123.16 | 36950. | 300.02 |
| 230 | 725.00 | 123.16 | 36950. | 300.02 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 229 | 725.00 | 123.16 | 36950. | 300.02 |
| 231 | 725.00 | 123.16 | 36950. | 300.02 |
| 1104 | 725.00 | -119.71 | 36950. | 308.65 |
| 528 | 725.00 | -119.65 | 36950. | 308.82 |
| 369 | 725.00 | -115.89 | 36950. | 318.84 |
| 371 | 725.00 | -115.89 | 36950. | 318.84 |
| 365 | 725.00 | -115.89 | 36950. | 318.84 |
| 367 | 725.00 | -115.89 | 36950. | 318.84 |
| 364 | 725.00 | -115.89 | 36950. | 318.84 |
| 366 | 725.00 | -115.89 | 36950. | 318.84 |
| 368 | 725.00 | -115.89 | 36950. | 318.84 |
| 372 | 725.00 | -115.89 | 36950. | 318.84 |
| 370 | 725.00 | -115.89 | 36950. | 318.84 |
| 941 | 725.00 | -115.54 | 36950. | 319.81 |
| 942 | 725.00 | -115.54 | 36950. | 319.81 |
| 947 | 725.00 | -115.54 | 36950. | 319.81 |
| 946 | 725.00 | -115.54 | 36950. | 319.81 |
| 945 | 725.00 | -115.54 | 36950. | 319.81 |
| 944 | 725.00 | -115.54 | 36950. | 319.81 |
| 943 | 725.00 | -115.54 | 36950. | 319.81 |
| 940 | 725.00 | -115.54 | 36950. | 319.81 |
| 948 | 725.00 | -115.54 | 36950. | 319.81 |
| 326 | 725.00 | 114.36 | 36950. | 323.11 |
| 329 | 725.00 | 114.36 | 36950. | 323.11 |
| 327 | 725.00 | 114.36 | 36950. | 323.11 |
| 328 | 725.00 | 114.36 | 36950. | 323.11 |
| 330 | 725.00 | 114.36 | 36950. | 323.11 |
| 325 | 725.00 | 114.36 | 36950. | 323.11 |
| 904 | 725.00 | 114.35 | 36950. | 323.13 |
| 903 | 725.00 | 114.35 | 36950. | 323.13 |
| 902 | 725.00 | 114.35 | 36950. | 323.13 |
| 906 | 725.00 | 114.35 | 36950. | 323.13 |
| 905 | 725.00 | 114.35 | 36950. | 323.13 |
| 901 | 725.00 | 114.35 | 36950. | 323.13 |
| 1178 | 725.00 | 112.62 | 36950. | 328.08 |
| 1179 | 725.00 | 112.62 | 36950. | 328.08 |
| 1177 | 725.00 | 112.62 | 36950. | 328.08 |
| 81 | 725.00 | 111.82 | 36950. | 330.44 |
| 83 | 725.00 | 111.82 | 36950. | 330.44 |
| 80 | 725.00 | 111.82 | 36950. | 330.44 |
| 77 | 725.00 | 111.82 | 36950. | 330.44 |
| 79 | 725.00 | 111.82 | 36950. | 330.44 |
| 76 | 725.00 | 111.82 | 36950. | 330.44 |
| 78 | 725.00 | 111.82 | 36950. | 330.44 |
| 84 | 725.00 | 111.82 | 36950. | 330.44 |
| 82 | 725.00 | 111.82 | 36950. | 330.44 |
| 657 | 725.00 | 111.47 | 36950. | 331.49 |
| 659 | 725.00 | 111.47 | 36950. | 331.49 |
| 654 | 725.00 | 111.47 | 36950. | 331.49 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 653 | 725.00 | 111.47 | 36950. | 331.49 |
| 655 | 725.00 | 111.47 | 36950. | 331.49 |
| 652 | 725.00 | 111.47 | 36950. | 331.49 |
| 656 | 725.00 | 111.47 | 36950. | 331.49 |
| 658 | 725.00 | 111.47 | 36950. | 331.49 |
| 660 | 725.00 | 111.47 | 36950. | 331.49 |
| 186 | 725.00 | -109.58 | 36950. | 337.19 |
| 762 | 725.00 | -109.56 | 36950. | 337.25 |
| 198 | 725.00 | -107.91 | 36950. | 342.41 |
| 194 | 725.00 | -107.91 | 36950. | 342.41 |
| 195 | 725.00 | -107.91 | 36950. | 342.41 |
| 196 | 725.00 | -107.91 | 36950. | 342.41 |
| 197 | 725.00 | -107.91 | 36950. | 342.41 |
| 193 | 725.00 | -107.91 | 36950. | 342.41 |
| 769 | 725.00 | -107.90 | 36950. | 342.44 |
| 774 | 725.00 | -107.90 | 36950. | 342.44 |
| 772 | 725.00 | -107.90 | 36950. | 342.44 |
| 771 | 725.00 | -107.90 | 36950. | 342.44 |
| 770 | 725.00 | -107.90 | 36950. | 342.44 |
| 773 | 725.00 | -107.90 | 36950. | 342.44 |
| 719 | 725.00 | -106.45 | 36950. | 347.12 |
| 143 | 725.00 | -106.24 | 36950. | 347.78 |
| 192 | 725.00 | -102.59 | 36950. | 360.15 |
| 188 | 725.00 | -102.59 | 36950. | 360.15 |
| 189 | 725.00 | -102.59 | 36950. | 360.15 |
| 190 | 725.00 | -102.59 | 36950. | 360.15 |
| 191 | 725.00 | -102.59 | 36950. | 360.15 |
| 187 | 725.00 | -102.59 | 36950. | 360.15 |
| 765 | 725.00 | -102.57 | 36950. | 360.24 |
| 768 | 725.00 | -102.57 | 36950. | 360.24 |
| 764 | 725.00 | -102.57 | 36950. | 360.24 |
| 767 | 725.00 | -102.57 | 36950. | 360.24 |
| 766 | 725.00 | -102.57 | 36950. | 360.24 |
| 763 | 725.00 | -102.57 | 36950. | 360.24 |
| 1187 | 725.00 | -102.12 | 36950. | 361.83 |
| 1186 | 725.00 | -102.12 | 36950. | 361.83 |
| 1188 | 725.00 | -102.12 | 36950. | 361.83 |
| 48 | 725.00 | -101.15 | 36950. | 365.31 |
| 624 | 725.00 | -101.14 | 36950. | 365.33 |
| 755 | 725.00 | 97.404 | 36950. | 379.35 |
| 754 | 725.00 | 97.404 | 36950. | 379.35 |
| 756 | 725.00 | 97.404 | 36950. | 379.35 |
| 180 | 725.00 | 97.394 | 36950. | 379.39 |
| 178 | 725.00 | 97.394 | 36950. | 379.39 |
| 179 | 725.00 | 97.394 | 36950. | 379.39 |
| 378 | 725.00 | -95.715 | 36950. | 386.04 |
| 954 | 725.00 | -95.628 | 36950. | 386.39 |
| 1093 | 725.00 | -94.598 | 36950. | 390.60 |
| 1097 | 725.00 | -94.598 | 36950. | 390.60 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1096 | 725.00 | -94.598 | 36950. | 390.60 |
| 1095 | 725.00 | -94.598 | 36950. | 390.60 |
| 1094 | 725.00 | -94.598 | 36950. | 390.60 |
| 1098 | 725.00 | -94.598 | 36950. | 390.60 |
| 517 | 725.00 | -94.559 | 36950. | 390.76 |
| 520 | 725.00 | -94.559 | 36950. | 390.76 |
| 522 | 725.00 | -94.559 | 36950. | 390.76 |
| 519 | 725.00 | -94.559 | 36950. | 390.76 |
| 518 | 725.00 | -94.559 | 36950. | 390.76 |
| 521 | 725.00 | -94.559 | 36950. | 390.76 |
| 382 | 725.00 | -92.737 | 36950. | 398.44 |
| 380 | 725.00 | -92.737 | 36950. | 398.44 |
| 384 | 725.00 | -92.737 | 36950. | 398.44 |
| 381 | 725.00 | -92.737 | 36950. | 398.44 |
| 383 | 725.00 | -92.737 | 36950. | 398.44 |
| 379 | 725.00 | -92.737 | 36950. | 398.44 |
| 957 | 725.00 | -92.668 | 36950. | 398.74 |
| 958 | 725.00 | -92.668 | 36950. | 398.74 |
| 956 | 725.00 | -92.668 | 36950. | 398.74 |
| 959 | 725.00 | -92.668 | 36950. | 398.74 |
| 960 | 725.00 | -92.668 | 36950. | 398.74 |
| 955 | 725.00 | -92.668 | 36950. | 398.74 |
| 1235 | 725.00 | -84.033 | 36950. | 439.71 |
| 1240 | 725.00 | -84.020 | 36950. | 439.77 |
| 586 | 725.00 | -82.263 | 36950. | 449.17 |
| 587 | 725.00 | -82.263 | 36950. | 449.17 |
| 590 | 725.00 | -82.263 | 36950. | 449.17 |
| 588 | 725.00 | -82.263 | 36950. | 449.17 |
| 589 | 725.00 | -82.263 | 36950. | 449.17 |
| 591 | 725.00 | -82.263 | 36950. | 449.17 |
| 10 | 725.00 | -82.201 | 36950. | 449.51 |
| 15 | 725.00 | -82.201 | 36950. | 449.51 |
| 13 | 725.00 | -82.201 | 36950. | 449.51 |
| 11 | 725.00 | -82.201 | 36950. | 449.51 |
| 14 | 725.00 | -82.201 | 36950. | 449.51 |
| 12 | 725.00 | -82.201 | 36950. | 449.51 |
| 720 | 725.00 | -77.981 | 36950. | 473.83 |
| 144 | 725.00 | -77.778 | 36950. | 475.07 |
| 932 | 725.00 | 76.928 | 36950. | 480.32 |
| 934 | 725.00 | 76.928 | 36950. | 480.32 |
| 933 | 725.00 | 76.928 | 36950. | 480.32 |
| 931 | 725.00 | 76.928 | 36950. | 480.32 |
| 935 | 725.00 | 76.928 | 36950. | 480.32 |
| 936 | 725.00 | 76.928 | 36950. | 480.32 |
| 360 | 725.00 | 76.806 | 36950. | 481.08 |
| 358 | 725.00 | 76.806 | 36950. | 481.08 |
| 356 | 725.00 | 76.806 | 36950. | 481.08 |
| 359 | 725.00 | 76.806 | 36950. | 481.08 |
| 357 | 725.00 | 76.806 | 36950. | 481.08 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 355 | 725.00 | 76.806 | 36950. | 481.08 |
| 37 | 725.00 | -66.515 | 36950. | 555.52 |
| 40 | 725.00 | -66.515 | 36950. | 555.52 |
| 42 | 725.00 | -66.515 | 36950. | 555.52 |
| 38 | 725.00 | -66.515 | 36950. | 555.52 |
| 39 | 725.00 | -66.515 | 36950. | 555.52 |
| 41 | 725.00 | -66.515 | 36950. | 555.52 |
| 613 | 725.00 | -66.506 | 36950. | 555.58 |
| 614 | 725.00 | -66.506 | 36950. | 555.58 |
| 617 | 725.00 | -66.506 | 36950. | 555.58 |
| 616 | 725.00 | -66.506 | 36950. | 555.58 |
| 615 | 725.00 | -66.506 | 36950. | 555.58 |
| 618 | 725.00 | -66.506 | 36950. | 555.58 |
| 1200 | 725.00 | -65.624 | 36950. | 563.05 |
| 1198 | 725.00 | -65.624 | 36950. | 563.05 |
| 1199 | 725.00 | -65.624 | 36950. | 563.05 |
| 489 | 725.00 | 60.366 | 36950. | 612.10 |
| 488 | 725.00 | 60.366 | 36950. | 612.10 |
| 487 | 725.00 | 60.366 | 36950. | 612.10 |
| 1065 | 725.00 | 60.316 | 36950. | 612.60 |
| 1063 | 725.00 | 60.316 | 36950. | 612.60 |
| 1064 | 725.00 | 60.316 | 36950. | 612.60 |
| 1002 | 725.00 | 55.369 | 36950. | 667.35 |
| 426 | 725.00 | 55.300 | 36950. | 668.17 |
| 714 | 725.00 | -54.134 | 36950. | 682.56 |
| 138 | 725.00 | -54.067 | 36950. | 683.41 |
| 649 | 725.00 | -51.801 | 36950. | 713.31 |
| 651 | 725.00 | -51.801 | 36950. | 713.31 |
| 650 | 725.00 | -51.801 | 36950. | 713.31 |
| 75 | 725.00 | -51.614 | 36950. | 715.90 |
| 73 | 725.00 | -51.614 | 36950. | 715.90 |
| 74 | 725.00 | -51.614 | 36950. | 715.90 |
| 1234 | 725.00 | -51.460 | 36950. | 718.03 |
| 1239 | 725.00 | -51.448 | 36950. | 718.20 |
| 571 | 725.00 | 50.448 | 36950. | 732.44 |
| 1147 | 725.00 | 50.435 | 36950. | 732.62 |
| 1237 | 725.00 | 47.270 | 36950. | 781.68 |
| 1232 | 725.00 | 47.257 | 36950. | 781.89 |
| 1036 | 725.00 | -47.115 | 36950. | 784.25 |
| 1040 | 725.00 | -47.115 | 36950. | 784.25 |
| 1037 | 725.00 | -47.115 | 36950. | 784.25 |
| 1038 | 725.00 | -47.115 | 36950. | 784.25 |
| 1039 | 725.00 | -47.115 | 36950. | 784.25 |
| 1041 | 725.00 | -47.115 | 36950. | 784.25 |
| 460 | 725.00 | -47.106 | 36950. | 784.39 |
| 464 | 725.00 | -47.106 | 36950. | 784.39 |
| 462 | 725.00 | -47.106 | 36950. | 784.39 |
| 463 | 725.00 | -47.106 | 36950. | 784.39 |
| 461 | 725.00 | -47.106 | 36950. | 784.39 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 465 | 725.00 | -47.106 | 36950. | 784.39 |
| 1231 | 725.00 | -46.763 | 36950. | 790.16 |
| 1236 | 725.00 | -46.748 | 36950. | 790.41 |
| 1191 | 725.00 | -45.604 | 36950. | 810.23 |
| 1190 | 725.00 | -45.604 | 36950. | 810.23 |
| 1189 | 725.00 | -45.604 | 36950. | 810.23 |
| 1226 | 725.00 | -44.829 | 36950. | 824.24 |
| 1221 | 725.00 | -44.819 | 36950. | 824.43 |
| 864 | 725.00 | -41.544 | 36950. | 889.41 |
| 288 | 725.00 | -41.534 | 36950. | 889.62 |
| 1196 | 725.00 | -30.452 | 36950. | 1213.4 |
| 1197 | 725.00 | -30.452 | 36950. | 1213.4 |
| 1195 | 725.00 | -30.452 | 36950. | 1213.4 |
| 1206 | 725.00 | 29.130 | 36950. | 1268.5 |
| 1216 | 725.00 | 29.022 | 36950. | 1273.2 |
| 1201 | 725.00 | -27.593 | 36950. | 1339.1 |
| 1211 | 725.00 | -27.483 | 36950. | 1344.5 |
| 1233 | 725.00 | -18.888 | 36950. | 1956.3 |
| 1238 | 725.00 | -18.875 | 36950. | 1957.6 |
| 1043 | 725.00 | -18.103 | 36950. | 2041.1 |
| 1042 | 725.00 | -18.103 | 36950. | 2041.1 |
| 1044 | 725.00 | -18.103 | 36950. | 2041.1 |
| 466 | 725.00 | -18.095 | 36950. | 2042.0 |
| 468 | 725.00 | -18.095 | 36950. | 2042.0 |
| 467 | 725.00 | -18.095 | 36950. | 2042.0 |
| 1142 | 725.00 | -17.750 | 36950. | 2081.6 |
| 1143 | 725.00 | -17.750 | 36950. | 2081.6 |
| 1144 | 725.00 | -17.750 | 36950. | 2081.6 |
| 1141 | 725.00 | -17.750 | 36950. | 2081.6 |
| 1145 | 725.00 | -17.750 | 36950. | 2081.6 |
| 1146 | 725.00 | -17.750 | 36950. | 2081.6 |
| 565 | 725.00 | -17.736 | 36950. | 2083.3 |
| 566 | 725.00 | -17.736 | 36950. | 2083.3 |
| 567 | 725.00 | -17.736 | 36950. | 2083.3 |
| 568 | 725.00 | -17.736 | 36950. | 2083.3 |
| 569 | 725.00 | -17.736 | 36950. | 2083.3 |
| 570 | 725.00 | -17.736 | 36950. | 2083.3 |
| 361 | 725.00 | -16.931 | 36950. | 2182.4 |
| 362 | 725.00 | -16.931 | 36950. | 2182.4 |
| 363 | 725.00 | -16.931 | 36950. | 2182.4 |
| 938 | 725.00 | -16.740 | 36950. | 2207.4 |
| 939 | 725.00 | -16.740 | 36950. | 2207.4 |
| 937 | 725.00 | -16.740 | 36950. | 2207.4 |
| 775 | 725.00 | 15.292 | 36950. | 2416.3 |
| 776 | 725.00 | 15.292 | 36950. | 2416.3 |
| 777 | 725.00 | 15.292 | 36950. | 2416.3 |
| 199 | 725.00 | 15.245 | 36950. | 2423.8 |
| 200 | 725.00 | 15.245 | 36950. | 2423.8 |
| 201 | 725.00 | 15.245 | 36950. | 2423.8 |

Table 1 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 874 | 725.00 | 2.2247 | 36950. | 16609. |
| 875 | 725.00 | 2.2247 | 36950. | 16609. |
| 876 | 725.00 | 2.2247 | 36950. | 16609. |
| 877 | 725.00 | 2.2247 | 36950. | 16609. |
| 878 | 725.00 | 2.2247 | 36950. | 16609. |
| 879 | 725.00 | 2.2247 | 36950. | 16609. |
| 298 | 725.00 | 2.1593 | 36950. | 17112. |
| 299 | 725.00 | 2.1593 | 36950. | 17112. |
| 300 | 725.00 | 2.1593 | 36950. | 17112. |
| 301 | 725.00 | 2.1593 | 36950. | 17112. |
| 302 | 725.00 | 2.1593 | 36950. | 17112. |
| 303 | 725.00 | 2.1593 | 36950. | 17112. |

Table 2

TITLE=
MPC-24E Structural Analysis

SUBTITLE 1 =
Component: Fuel Basket
SUBTITLE 2 =
Load Combination: F2.a (See Table 2.1.6)
SUBTITLE 3 =
Stress Result: Primary Local Plus Primary Bending (PL+PB)

PRINT ELEMENT TABLE ITEMS PER ELEMENT

| STAT ELEM | CURRENT REF TEMP | CURRENT PL+PB | PREVIOUS ALLOW | PREVIOUS SF |
|---|---|---|---|---|
| 1065 | 725.00 | 31912. | 55450. | 1.7376 |
| 489 | 725.00 | 31908. | 55450. | 1.7378 |
| 577 | 725.00 | 30485. | 55450. | 1.8189 |
| 1 | 725.00 | 30485. | 55450. | 1.8190 |
| 585 | 725.00 | 29419. | 55450. | 1.8848 |
| 9 | 725.00 | 29418. | 55450. | 1.8849 |
| 1017 | 725.00 | 28955. | 55450. | 1.9151 |
| 441 | 725.00 | 28953. | 55450. | 1.9151 |
| 1016 | 725.00 | 28480. | 55450. | 1.9470 |
| 440 | 725.00 | 28479. | 55450. | 1.9471 |
| 18 | 725.00 | 28329. | 55450. | 1.9573 |
| 594 | 725.00 | 28329. | 55450. | 1.9574 |
| 1064 | 725.00 | 27890. | 55450. | 1.9882 |
| 488 | 725.00 | 27887. | 55450. | 1.9884 |
| 578 | 725.00 | 27052. | 55450. | 2.0497 |
| 2 | 725.00 | 27052. | 55450. | 2.0497 |
| 363 | 725.00 | 26747. | 55450. | 2.0732 |
| 939 | 725.00 | 26736. | 55450. | 2.0740 |
| 584 | 725.00 | 25979. | 55450. | 2.1344 |
| 8 | 725.00 | 25979. | 55450. | 2.1344 |
| 172 | 725.00 | 25744. | 55450. | 2.1539 |
| 748 | 725.00 | 25743. | 55450. | 2.1540 |
| 931 | 725.00 | 25672. | 55450. | 2.1600 |
| 355 | 725.00 | 25663. | 55450. | 2.1607 |
| 1015 | 725.00 | 25151. | 55450. | 2.2047 |
| 439 | 725.00 | 25149. | 55450. | 2.2049 |
| 17 | 725.00 | 24694. | 55450. | 2.2455 |
| 593 | 725.00 | 24693. | 55450. | 2.2455 |
| 586 | 725.00 | 24393. | 55450. | 2.2732 |
| 10 | 725.00 | 24390. | 55450. | 2.2735 |
| 499 | 725.00 | 23553. | 55450. | 2.3542 |
| 1075 | 725.00 | 23549. | 55450. | 2.3546 |
| 362 | 725.00 | 23219. | 55450. | 2.3881 |
| 938 | 725.00 | 23209. | 55450. | 2.3892 |
| 500 | 725.00 | 22965. | 55450. | 2.4145 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1076 | 725.00 | 22961. | 55450. | 2.4149 |
| 352 | 725.00 | 22830. | 55450. | 2.4288 |
| 928 | 725.00 | 22829. | 55450. | 2.4289 |
| 173 | 725.00 | 22541. | 55450. | 2.4600 |
| 749 | 725.00 | 22540. | 55450. | 2.4601 |
| 932 | 725.00 | 22348. | 55450. | 2.4812 |
| 356 | 725.00 | 22340. | 55450. | 2.4821 |
| 97 | 725.00 | 22189. | 55450. | 2.4990 |
| 673 | 725.00 | 22175. | 55450. | 2.5005 |
| 565 | 725.00 | 22069. | 55450. | 2.5126 |
| 1141 | 725.00 | 22068. | 55450. | 2.5127 |
| 229 | 725.00 | 21831. | 55450. | 2.5400 |
| 805 | 725.00 | 21824. | 55450. | 2.5408 |
| 353 | 725.00 | 21585. | 55450. | 2.5689 |
| 929 | 725.00 | 21584. | 55450. | 2.5690 |
| 901 | 725.00 | 21581. | 55450. | 2.5694 |
| 325 | 725.00 | 21581. | 55450. | 2.5694 |
| 1051 | 725.00 | 21555. | 55450. | 2.5725 |
| 475 | 725.00 | 21553. | 55450. | 2.5727 |
| 36 | 725.00 | 21304. | 55450. | 2.6028 |
| 612 | 725.00 | 21303. | 55450. | 2.6029 |
| 667 | 725.00 | 21290. | 55450. | 2.6045 |
| 91 | 725.00 | 21282. | 55450. | 2.6055 |
| 587 | 725.00 | 21124. | 55450. | 2.6250 |
| 11 | 725.00 | 21121. | 55450. | 2.6253 |
| 421 | 725.00 | 21053. | 55450. | 2.6338 |
| 997 | 725.00 | 21046. | 55450. | 2.6347 |
| 611 | 725.00 | 20937. | 55450. | 2.6484 |
| 35 | 725.00 | 20937. | 55450. | 2.6485 |
| 678 | 725.00 | 20640. | 55450. | 2.6865 |
| 102 | 725.00 | 20626. | 55450. | 2.6883 |
| 484 | 725.00 | 20415. | 55450. | 2.7162 |
| 483 | 725.00 | 20415. | 55450. | 2.7162 |
| 1060 | 725.00 | 20414. | 55450. | 2.7162 |
| 1059 | 725.00 | 20414. | 55450. | 2.7162 |
| 98 | 725.00 | 19208. | 55450. | 2.8868 |
| 674 | 725.00 | 19195. | 55450. | 2.8887 |
| 566 | 725.00 | 18997. | 55450. | 2.9188 |
| 1142 | 725.00 | 18997. | 55450. | 2.9189 |
| 756 | 725.00 | 18917. | 55450. | 2.9312 |
| 180 | 725.00 | 18914. | 55450. | 2.9316 |
| 230 | 725.00 | 18623. | 55450. | 2.9776 |
| 806 | 725.00 | 18616. | 55450. | 2.9786 |
| 809 | 725.00 | 18558. | 55450. | 2.9880 |
| 808 | 725.00 | 18558. | 55450. | 2.9880 |
| 233 | 725.00 | 18557. | 55450. | 2.9881 |
| 232 | 725.00 | 18557. | 55450. | 2.9881 |
| 1052 | 725.00 | 18441. | 55450. | 3.0069 |
| 476 | 725.00 | 18439. | 55450. | 3.0072 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 902 | 725.00 | 18431. | 55450. | 3.0085 |
| 326 | 725.00 | 18431. | 55450. | 3.0086 |
| 610 | 725.00 | 18366. | 55450. | 3.0192 |
| 34 | 725.00 | 18363. | 55450. | 3.0197 |
| 1167 | 725.00 | 18182. | 55450. | 3.0498 |
| 1155 | 725.00 | 18180. | 55450. | 3.0500 |
| 668 | 725.00 | 18171. | 55450. | 3.0515 |
| 92 | 725.00 | 18163. | 55450. | 3.0528 |
| 1202 | 725.00 | 18150. | 55450. | 3.0551 |
| 1212 | 725.00 | 18143. | 55450. | 3.0563 |
| 481 | 725.00 | 18014. | 55450. | 3.0782 |
| 1057 | 725.00 | 18011. | 55450. | 3.0787 |
| 873 | 725.00 | 17969. | 55450. | 3.0858 |
| 297 | 725.00 | 17969. | 55450. | 3.0859 |
| 1161 | 725.00 | 17944. | 55450. | 3.0902 |
| 1173 | 725.00 | 17943. | 55450. | 3.0904 |
| 888 | 725.00 | 17755. | 55450. | 3.1230 |
| 312 | 725.00 | 17755. | 55450. | 3.1231 |
| 677 | 725.00 | 17727. | 55450. | 3.1280 |
| 101 | 725.00 | 17714. | 55450. | 3.1303 |
| 12 | 725.00 | 17628. | 55450. | 3.1456 |
| 13 | 725.00 | 17628. | 55450. | 3.1456 |
| 588 | 725.00 | 17627. | 55450. | 3.1457 |
| 589 | 725.00 | 17627. | 55450. | 3.1457 |
| 933 | 725.00 | 17602. | 55450. | 3.1503 |
| 934 | 725.00 | 17602. | 55450. | 3.1503 |
| 357 | 725.00 | 17601. | 55450. | 3.1504 |
| 358 | 725.00 | 17601. | 55450. | 3.1504 |
| 887 | 725.00 | 17285. | 55450. | 3.2080 |
| 311 | 725.00 | 17285. | 55450. | 3.2081 |
| 755 | 725.00 | 17179. | 55450. | 3.2277 |
| 179 | 725.00 | 17177. | 55450. | 3.2282 |
| 904 | 725.00 | 17169. | 55450. | 3.2297 |
| 905 | 725.00 | 17169. | 55450. | 3.2297 |
| 329 | 725.00 | 17168. | 55450. | 3.2298 |
| 328 | 725.00 | 17168. | 55450. | 3.2298 |
| 1152 | 725.00 | 17162. | 55450. | 3.2310 |
| 576 | 725.00 | 17160. | 55450. | 3.2313 |
| 649 | 725.00 | 17159. | 55450. | 3.2316 |
| 73 | 725.00 | 17155. | 55450. | 3.2324 |
| 777 | 725.00 | 17126. | 55450. | 3.2378 |
| 201 | 725.00 | 17122. | 55450. | 3.2386 |
| 304 | 725.00 | 16961. | 55450. | 3.2693 |
| 880 | 725.00 | 16960. | 55450. | 3.2694 |
| 807 | 725.00 | 16807. | 55450. | 3.2992 |
| 231 | 725.00 | 16804. | 55450. | 3.2997 |
| 670 | 725.00 | 16618. | 55450. | 3.3367 |
| 671 | 725.00 | 16618. | 55450. | 3.3367 |
| 94 | 725.00 | 16618. | 55450. | 3.3368 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 95 | 725.00 | 16618. | 55450. | 3.3368 |
| 1182 | 725.00 | 16565. | 55450. | 3.3475 |
| 1180 | 725.00 | 16564. | 55450. | 3.3476 |
| 501 | 725.00 | 16527. | 55450. | 3.3551 |
| 1181 | 725.00 | 16525. | 55450. | 3.3555 |
| 1077 | 725.00 | 16524. | 55450. | 3.3558 |
| 1156 | 725.00 | 16391. | 55450. | 3.3829 |
| 1168 | 725.00 | 16384. | 55450. | 3.3843 |
| 1146 | 725.00 | 16376. | 55450. | 3.3860 |
| 570 | 725.00 | 16375. | 55450. | 3.3862 |
| 1055 | 725.00 | 16248. | 55450. | 3.4127 |
| 1054 | 725.00 | 16248. | 55450. | 3.4127 |
| 478 | 725.00 | 16248. | 55450. | 3.4128 |
| 479 | 725.00 | 16248. | 55450. | 3.4128 |
| 1166 | 725.00 | 16208. | 55450. | 3.4211 |
| 1154 | 725.00 | 16207. | 55450. | 3.4213 |
| 1200 | 725.00 | 16184. | 55450. | 3.4263 |
| 1198 | 725.00 | 16183. | 55450. | 3.4264 |
| 1199 | 725.00 | 16144. | 55450. | 3.4347 |
| 1160 | 725.00 | 16042. | 55450. | 3.4566 |
| 1172 | 725.00 | 16041. | 55450. | 3.4569 |
| 327 | 725.00 | 15937. | 55450. | 3.4794 |
| 903 | 725.00 | 15937. | 55450. | 3.4794 |
| 1211 | 725.00 | 15920. | 55450. | 3.4831 |
| 1201 | 725.00 | 15916. | 55450. | 3.4840 |
| 3 | 725.00 | 15793. | 55450. | 3.5111 |
| 4 | 725.00 | 15793. | 55450. | 3.5111 |
| 579 | 725.00 | 15793. | 55450. | 3.5111 |
| 580 | 725.00 | 15793. | 55450. | 3.5111 |
| 93 | 725.00 | 15669. | 55450. | 3.5389 |
| 669 | 725.00 | 15666. | 55450. | 3.5394 |
| 1176 | 725.00 | 15644. | 55450. | 3.5446 |
| 1164 | 725.00 | 15635. | 55450. | 3.5465 |
| 504 | 725.00 | 15355. | 55450. | 3.6111 |
| 1080 | 725.00 | 15355. | 55450. | 3.6113 |
| 477 | 725.00 | 15334. | 55450. | 3.6161 |
| 1194 | 725.00 | 15334. | 55450. | 3.6162 |
| 1053 | 725.00 | 15334. | 55450. | 3.6162 |
| 1192 | 725.00 | 15333. | 55450. | 3.6164 |
| 1193 | 725.00 | 15294. | 55450. | 3.6255 |
| 1158 | 725.00 | 15252. | 55450. | 3.6355 |
| 1170 | 725.00 | 15245. | 55450. | 3.6372 |
| 1062 | 725.00 | 15227. | 55450. | 3.6416 |
| 486 | 725.00 | 15223. | 55450. | 3.6425 |
| 1083 | 725.00 | 15129. | 55450. | 3.6651 |
| 507 | 725.00 | 15124. | 55450. | 3.6663 |
| 750 | 725.00 | 15033. | 55450. | 3.6886 |
| 751 | 725.00 | 15033. | 55450. | 3.6886 |
| 175 | 725.00 | 15033. | 55450. | 3.6886 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 174 | 725.00 | 15033. | 55450. | 3.6886 |
| 482 | 725.00 | 14908. | 55450. | 3.7194 |
| 1082 | 725.00 | 14906. | 55450. | 3.7199 |
| 1058 | 725.00 | 14906. | 55450. | 3.7201 |
| 506 | 725.00 | 14901. | 55450. | 3.7212 |
| 1140 | 725.00 | 14854. | 55450. | 3.7331 |
| 564 | 725.00 | 14851. | 55450. | 3.7337 |
| 816 | 725.00 | 14838. | 55450. | 3.7369 |
| 240 | 725.00 | 14834. | 55450. | 3.7379 |
| 503 | 725.00 | 14774. | 55450. | 3.7533 |
| 1079 | 725.00 | 14773. | 55450. | 3.7535 |
| 892 | 725.00 | 14744. | 55450. | 3.7609 |
| 316 | 725.00 | 14738. | 55450. | 3.7623 |
| 1139 | 725.00 | 14678. | 55450. | 3.7776 |
| 563 | 725.00 | 14676. | 55450. | 3.7782 |
| 643 | 725.00 | 14629. | 55450. | 3.7903 |
| 67 | 725.00 | 14621. | 55450. | 3.7925 |
| 872 | 725.00 | 14547. | 55450. | 3.8119 |
| 296 | 725.00 | 14546. | 55450. | 3.8120 |
| 893 | 725.00 | 14495. | 55450. | 3.8254 |
| 317 | 725.00 | 14490. | 55450. | 3.8268 |
| 474 | 725.00 | 14485. | 55450. | 3.8280 |
| 1050 | 725.00 | 14483. | 55450. | 3.8285 |
| 568 | 725.00 | 14287. | 55450. | 3.8812 |
| 569 | 725.00 | 14287. | 55450. | 3.8812 |
| 1145 | 725.00 | 14286. | 55450. | 3.8813 |
| 1144 | 725.00 | 14286. | 55450. | 3.8813 |
| 485 | 725.00 | 14268. | 55450. | 3.8864 |
| 1061 | 725.00 | 14266. | 55450. | 3.8870 |
| 810 | 725.00 | 14184. | 55450. | 3.9093 |
| 234 | 725.00 | 14180. | 55450. | 3.9104 |
| 181 | 725.00 | 14077. | 55450. | 3.9389 |
| 757 | 725.00 | 14075. | 55450. | 3.9396 |
| 1157 | 725.00 | 14075. | 55450. | 3.9397 |
| 1169 | 725.00 | 14070. | 55450. | 3.9411 |
| 90 | 725.00 | 14038. | 55450. | 3.9501 |
| 666 | 725.00 | 14031. | 55450. | 3.9520 |
| 66 | 725.00 | 14024. | 55450. | 3.9539 |
| 1175 | 725.00 | 14019. | 55450. | 3.9554 |
| 642 | 725.00 | 14017. | 55450. | 3.9559 |
| 1163 | 725.00 | 14012. | 55450. | 3.9573 |
| 753 | 725.00 | 13983. | 55450. | 3.9656 |
| 177 | 725.00 | 13982. | 55450. | 3.9659 |
| 650 | 725.00 | 13976. | 55450. | 3.9675 |
| 74 | 725.00 | 13971. | 55450. | 3.9689 |
| 480 | 725.00 | 13871. | 55450. | 3.9975 |
| 1056 | 725.00 | 13869. | 55450. | 3.9981 |
| 644 | 725.00 | 13867. | 55450. | 3.9987 |
| 68 | 725.00 | 13859. | 55450. | 4.0010 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 935 | 725.00 | 13846. | 55450. | 4.0048 |
| 359 | 725.00 | 13841. | 55450. | 4.0062 |
| 675 | 725.00 | 13825. | 55450. | 4.0108 |
| 676 | 725.00 | 13825. | 55450. | 4.0108 |
| 99 | 725.00 | 13825. | 55450. | 4.0110 |
| 100 | 725.00 | 13825. | 55450. | 4.0110 |
| 874 | 725.00 | 13809. | 55450. | 4.0154 |
| 298 | 725.00 | 13806. | 55450. | 4.0163 |
| 1143 | 725.00 | 13762. | 55450. | 4.0291 |
| 567 | 725.00 | 13762. | 55450. | 4.0291 |
| 305 | 725.00 | 13740. | 55450. | 4.0356 |
| 881 | 725.00 | 13740. | 55450. | 4.0358 |
| 182 | 725.00 | 13684. | 55450. | 4.0521 |
| 758 | 725.00 | 13682. | 55450. | 4.0528 |
| 1081 | 725.00 | 13681. | 55450. | 4.0532 |
| 505 | 725.00 | 13675. | 55450. | 4.0550 |
| 295 | 725.00 | 13469. | 55450. | 4.1169 |
| 871 | 725.00 | 13468. | 55450. | 4.1171 |
| 1138 | 725.00 | 13450. | 55450. | 4.1227 |
| 562 | 725.00 | 13448. | 55450. | 4.1233 |
| 776 | 725.00 | 13436. | 55450. | 4.1270 |
| 200 | 725.00 | 13432. | 55450. | 4.1282 |
| 96 | 725.00 | 13418. | 55450. | 4.1324 |
| 672 | 725.00 | 13412. | 55450. | 4.1345 |
| 1099 | 725.00 | 13384. | 55450. | 4.1431 |
| 523 | 725.00 | 13381. | 55450. | 4.1440 |
| 1014 | 725.00 | 13325. | 55450. | 4.1612 |
| 438 | 725.00 | 13324. | 55450. | 4.1616 |
| 1185 | 725.00 | 13316. | 55450. | 4.1640 |
| 1183 | 725.00 | 13315. | 55450. | 4.1645 |
| 1013 | 725.00 | 13284. | 55450. | 4.1743 |
| 437 | 725.00 | 13283. | 55450. | 4.1747 |
| 792 | 725.00 | 13282. | 55450. | 4.1748 |
| 216 | 725.00 | 13282. | 55450. | 4.1750 |
| 1184 | 725.00 | 13277. | 55450. | 4.1764 |
| 1137 | 725.00 | 13275. | 55450. | 4.1771 |
| 561 | 725.00 | 13273. | 55450. | 4.1776 |
| 373 | 725.00 | 13271. | 55450. | 4.1782 |
| 590 | 725.00 | 13267. | 55450. | 4.1797 |
| 14 | 725.00 | 13266. | 55450. | 4.1798 |
| 949 | 725.00 | 13266. | 55450. | 4.1799 |
| 581 | 725.00 | 13226. | 55450. | 4.1925 |
| 5 | 725.00 | 13226. | 55450. | 4.1925 |
| 1136 | 725.00 | 13100. | 55450. | 4.2330 |
| 560 | 725.00 | 13098. | 55450. | 4.2335 |
| 875 | 725.00 | 13081. | 55450. | 4.2391 |
| 299 | 725.00 | 13078. | 55450. | 4.2401 |
| 65 | 725.00 | 13024. | 55450. | 4.2576 |
| 1100 | 725.00 | 13021. | 55450. | 4.2585 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 524 | 725.00 | 13018. | 55450. | 4.2594 |
| 641 | 725.00 | 13017. | 55450. | 4.2597 |
| 1203 | 725.00 | 13008. | 55450. | 4.2629 |
| 1204 | 725.00 | 13008. | 55450. | 4.2629 |
| 1213 | 725.00 | 13008. | 55450. | 4.2629 |
| 1214 | 725.00 | 13008. | 55450. | 4.2629 |
| 1231 | 725.00 | 12988. | 55450. | 4.2694 |
| 1236 | 725.00 | 12986. | 55450. | 4.2699 |
| 374 | 725.00 | 12916. | 55450. | 4.2933 |
| 950 | 725.00 | 12910. | 55450. | 4.2950 |
| 336 | 725.00 | 12898. | 55450. | 4.2991 |
| 912 | 725.00 | 12898. | 55450. | 4.2993 |
| 791 | 725.00 | 12869. | 55450. | 4.3089 |
| 215 | 725.00 | 12868. | 55450. | 4.3090 |
| 354 | 725.00 | 12854. | 55450. | 4.3137 |
| 930 | 725.00 | 12847. | 55450. | 4.3161 |
| 1012 | 725.00 | 12826. | 55450. | 4.3232 |
| 436 | 725.00 | 12825. | 55450. | 4.3235 |
| 306 | 725.00 | 12707. | 55450. | 4.3639 |
| 882 | 725.00 | 12706. | 55450. | 4.3642 |
| 1134 | 725.00 | 12601. | 55450. | 4.4006 |
| 558 | 725.00 | 12599. | 55450. | 4.4012 |
| 1215 | 725.00 | 12404. | 55450. | 4.4703 |
| 1205 | 725.00 | 12396. | 55450. | 4.4732 |
| 1011 | 725.00 | 12369. | 55450. | 4.4830 |
| 435 | 725.00 | 12368. | 55450. | 4.4834 |
| 313 | 725.00 | 12300. | 55450. | 4.5080 |
| 889 | 725.00 | 12300. | 55450. | 4.5081 |
| 330 | 725.00 | 12272. | 55450. | 4.5183 |
| 906 | 725.00 | 12272. | 55450. | 4.5185 |
| 314 | 725.00 | 12267. | 55450. | 4.5204 |
| 890 | 725.00 | 12266. | 55450. | 4.5205 |
| 886 | 725.00 | 12137. | 55450. | 4.5685 |
| 310 | 725.00 | 12137. | 55450. | 4.5686 |
| 315 | 725.00 | 12030. | 55450. | 4.6092 |
| 891 | 725.00 | 12030. | 55450. | 4.6095 |
| 75 | 725.00 | 12008. | 55450. | 4.6178 |
| 651 | 725.00 | 11998. | 55450. | 4.6217 |
| 552 | 725.00 | 11923. | 55450. | 4.6505 |
| 1128 | 725.00 | 11922. | 55450. | 4.6510 |
| 1010 | 725.00 | 11912. | 55450. | 4.6551 |
| 434 | 725.00 | 11911. | 55450. | 4.6555 |
| 894 | 725.00 | 11775. | 55450. | 4.7090 |
| 318 | 725.00 | 11772. | 55450. | 4.7102 |
| 551 | 725.00 | 11738. | 55450. | 4.7239 |
| 1127 | 725.00 | 11737. | 55450. | 4.7243 |
| 1009 | 725.00 | 11454. | 55450. | 4.8410 |
| 433 | 725.00 | 11453. | 55450. | 4.8414 |
| 1226 | 725.00 | 11364. | 55450. | 4.8796 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1221 | 725.00 | 11363. | 55450. | 4.8799 |
| 752 | 725.00 | 11293. | 55450. | 4.9102 |
| 176 | 725.00 | 11292. | 55450. | 4.9106 |
| 883 | 725.00 | 11227. | 55450. | 4.9389 |
| 307 | 725.00 | 11227. | 55450. | 4.9391 |
| 1135 | 725.00 | 11183. | 55450. | 4.9586 |
| 559 | 725.00 | 11182. | 55450. | 4.9591 |
| 609 | 725.00 | 11103. | 55450. | 4.9941 |
| 33 | 725.00 | 11099. | 55450. | 4.9962 |
| 608 | 725.00 | 10976. | 55450. | 5.0517 |
| 32 | 725.00 | 10972. | 55450. | 5.0538 |
| 884 | 725.00 | 10763. | 55450. | 5.1517 |
| 308 | 725.00 | 10763. | 55450. | 5.1520 |
| 859 | 725.00 | 10562. | 55450. | 5.2501 |
| 283 | 725.00 | 10561. | 55450. | 5.2503 |
| 469 | 725.00 | 10539. | 55450. | 5.2615 |
| 1045 | 725.00 | 10536. | 55450. | 5.2628 |
| 199 | 725.00 | 10344. | 55450. | 5.3605 |
| 775 | 725.00 | 10343. | 55450. | 5.3611 |
| 145 | 725.00 | 10295. | 55450. | 5.3863 |
| 721 | 725.00 | 10294. | 55450. | 5.3864 |
| 450 | 725.00 | 10273. | 55450. | 5.3976 |
| 1026 | 725.00 | 10271. | 55450. | 5.3989 |
| 219 | 725.00 | 10262. | 55450. | 5.4033 |
| 795 | 725.00 | 10256. | 55450. | 5.4066 |
| 402 | 725.00 | 10223. | 55450. | 5.4240 |
| 978 | 725.00 | 10214. | 55450. | 5.4290 |
| 218 | 725.00 | 10205. | 55450. | 5.4334 |
| 794 | 725.00 | 10199. | 55450. | 5.4368 |
| 183 | 725.00 | 10164. | 55450. | 5.4558 |
| 759 | 725.00 | 10162. | 55450. | 5.4566 |
| 449 | 725.00 | 10157. | 55450. | 5.4593 |
| 1025 | 725.00 | 10155. | 55450. | 5.4606 |
| 1222 | 725.00 | 10154. | 55450. | 5.4609 |
| 1227 | 725.00 | 10154. | 55450. | 5.4611 |
| 502 | 725.00 | 10089. | 55450. | 5.4961 |
| 1078 | 725.00 | 10086. | 55450. | 5.4977 |
| 146 | 725.00 | 10043. | 55450. | 5.5210 |
| 722 | 725.00 | 10043. | 55450. | 5.5211 |
| 470 | 725.00 | 10025. | 55450. | 5.5312 |
| 1046 | 725.00 | 10023. | 55450. | 5.5325 |
| 815 | 725.00 | 10008. | 55450. | 5.5403 |
| 239 | 725.00 | 10006. | 55450. | 5.5418 |
| 473 | 725.00 | 9940.1 | 55450. | 5.5784 |
| 1049 | 725.00 | 9939.0 | 55450. | 5.5790 |
| 85 | 725.00 | 9933.0 | 55450. | 5.5824 |
| 661 | 725.00 | 9927.7 | 55450. | 5.5854 |
| 217 | 725.00 | 9893.5 | 55450. | 5.6047 |
| 793 | 725.00 | 9886.1 | 55450. | 5.6089 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1101 | 725.00 | 9772.4 | 55450. | 5.6741 |
| 525 | 725.00 | 9771.0 | 55450. | 5.6749 |
| 43 | 725.00 | 9765.6 | 55450. | 5.6781 |
| 619 | 725.00 | 9764.7 | 55450. | 5.6786 |
| 375 | 725.00 | 9730.3 | 55450. | 5.6987 |
| 951 | 725.00 | 9727.6 | 55450. | 5.7003 |
| 550 | 725.00 | 9711.4 | 55450. | 5.7098 |
| 1126 | 725.00 | 9710.8 | 55450. | 5.7102 |
| 401 | 725.00 | 9710.7 | 55450. | 5.7102 |
| 977 | 725.00 | 9701.7 | 55450. | 5.7155 |
| 89 | 725.00 | 9698.0 | 55450. | 5.7177 |
| 665 | 725.00 | 9693.5 | 55450. | 5.7203 |
| 15 | 725.00 | 9653.6 | 55450. | 5.7440 |
| 591 | 725.00 | 9652.0 | 55450. | 5.7449 |
| 897 | 725.00 | 9625.2 | 55450. | 5.7609 |
| 321 | 725.00 | 9620.1 | 55450. | 5.7640 |
| 607 | 725.00 | 9589.0 | 55450. | 5.7826 |
| 31 | 725.00 | 9586.9 | 55450. | 5.7839 |
| 44 | 725.00 | 9509.6 | 55450. | 5.8309 |
| 620 | 725.00 | 9508.8 | 55450. | 5.8314 |
| 86 | 725.00 | 9442.2 | 55450. | 5.8726 |
| 662 | 725.00 | 9437.2 | 55450. | 5.8757 |
| 114 | 725.00 | 9418.4 | 55450. | 5.8874 |
| 690 | 725.00 | 9408.5 | 55450. | 5.8936 |
| 896 | 725.00 | 9383.1 | 55450. | 5.9096 |
| 320 | 725.00 | 9378.2 | 55450. | 5.9126 |
| 448 | 725.00 | 9342.3 | 55450. | 5.9354 |
| 1024 | 725.00 | 9340.5 | 55450. | 5.9365 |
| 447 | 725.00 | 9226.2 | 55450. | 6.0101 |
| 1023 | 725.00 | 9224.5 | 55450. | 6.0112 |
| 1177 | 725.00 | 9181.1 | 55450. | 6.0396 |
| 1179 | 725.00 | 9179.3 | 55450. | 6.0407 |
| 1178 | 725.00 | 9141.5 | 55450. | 6.0657 |
| 446 | 725.00 | 9110.1 | 55450. | 6.0867 |
| 1022 | 725.00 | 9108.5 | 55450. | 6.0877 |
| 335 | 725.00 | 9067.9 | 55450. | 6.1150 |
| 911 | 725.00 | 9067.6 | 55450. | 6.1152 |
| 895 | 725.00 | 9055.5 | 55450. | 6.1233 |
| 319 | 725.00 | 9054.7 | 55450. | 6.1239 |
| 595 | 725.00 | 9046.9 | 55450. | 6.1291 |
| 19 | 725.00 | 9046.1 | 55450. | 6.1297 |
| 113 | 725.00 | 8904.0 | 55450. | 6.2276 |
| 689 | 725.00 | 8894.4 | 55450. | 6.2342 |
| 162 | 725.00 | 8864.3 | 55450. | 6.2554 |
| 738 | 725.00 | 8862.3 | 55450. | 6.2568 |
| 811 | 725.00 | 8832.5 | 55450. | 6.2780 |
| 235 | 725.00 | 8829.8 | 55450. | 6.2799 |
| 596 | 725.00 | 8767.9 | 55450. | 6.3242 |
| 20 | 725.00 | 8767.1 | 55450. | 6.3248 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 600 | 725.00 | 8652.8 | 55450. | 6.4083 |
| 24 | 725.00 | 8651.9 | 55450. | 6.4090 |
| 865 | 725.00 | 8627.6 | 55450. | 6.4270 |
| 289 | 725.00 | 8627.3 | 55450. | 6.4273 |
| 161 | 725.00 | 8598.9 | 55450. | 6.4485 |
| 737 | 725.00 | 8596.9 | 55450. | 6.4500 |
| 331 | 725.00 | 8452.2 | 55450. | 6.5604 |
| 907 | 725.00 | 8451.4 | 55450. | 6.5611 |
| 360 | 725.00 | 8411.4 | 55450. | 6.5922 |
| 936 | 725.00 | 8402.3 | 55450. | 6.5994 |
| 599 | 725.00 | 8380.1 | 55450. | 6.6168 |
| 23 | 725.00 | 8379.3 | 55450. | 6.6175 |
| 812 | 725.00 | 8365.0 | 55450. | 6.6288 |
| 236 | 725.00 | 8362.4 | 55450. | 6.6308 |
| 324 | 725.00 | 8273.6 | 55450. | 6.7020 |
| 900 | 725.00 | 8273.4 | 55450. | 6.7022 |
| 648 | 725.00 | 8253.3 | 55450. | 6.7186 |
| 547 | 725.00 | 8244.2 | 55450. | 6.7259 |
| 72 | 725.00 | 8244.0 | 55450. | 6.7261 |
| 1123 | 725.00 | 8243.1 | 55450. | 6.7268 |
| 6 | 725.00 | 8242.2 | 55450. | 6.7275 |
| 582 | 725.00 | 8242.2 | 55450. | 6.7275 |
| 30 | 725.00 | 8201.8 | 55450. | 6.7607 |
| 606 | 725.00 | 8201.7 | 55450. | 6.7608 |
| 154 | 725.00 | 8192.1 | 55450. | 6.7687 |
| 730 | 725.00 | 8190.2 | 55450. | 6.7703 |
| 899 | 725.00 | 8169.1 | 55450. | 6.7878 |
| 323 | 725.00 | 8168.9 | 55450. | 6.7880 |
| 548 | 725.00 | 8065.4 | 55450. | 6.8751 |
| 1124 | 725.00 | 8064.3 | 55450. | 6.8759 |
| 866 | 725.00 | 8057.7 | 55450. | 6.8816 |
| 290 | 725.00 | 8057.4 | 55450. | 6.8818 |
| 647 | 725.00 | 8031.8 | 55450. | 6.9038 |
| 71 | 725.00 | 8023.0 | 55450. | 6.9114 |
| 332 | 725.00 | 8018.3 | 55450. | 6.9154 |
| 908 | 725.00 | 8017.5 | 55450. | 6.9161 |
| 1008 | 725.00 | 7967.5 | 55450. | 6.9595 |
| 432 | 725.00 | 7960.4 | 55450. | 6.9657 |
| 155 | 725.00 | 7931.8 | 55450. | 6.9908 |
| 731 | 725.00 | 7930.0 | 55450. | 6.9925 |
| 445 | 725.00 | 7839.1 | 55450. | 7.0736 |
| 1021 | 725.00 | 7838.4 | 55450. | 7.0741 |
| 790 | 725.00 | 7719.0 | 55450. | 7.1836 |
| 214 | 725.00 | 7717.9 | 55450. | 7.1846 |
| 1125 | 725.00 | 7684.4 | 55450. | 7.2159 |
| 549 | 725.00 | 7684.4 | 55450. | 7.2159 |
| 442 | 725.00 | 7617.4 | 55450. | 7.2794 |
| 1018 | 725.00 | 7615.0 | 55450. | 7.2817 |
| 443 | 725.00 | 7496.1 | 55450. | 7.3972 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1019 | 725.00 | 7493.8 | 55450. | 7.3995 |
| 898 | 725.00 | 7437.5 | 55450. | 7.4555 |
| 322 | 725.00 | 7433.9 | 55450. | 7.4591 |
| 1225 | 725.00 | 7412.8 | 55450. | 7.4803 |
| 1230 | 725.00 | 7412.6 | 55450. | 7.4805 |
| 147 | 725.00 | 7293.3 | 55450. | 7.6029 |
| 723 | 725.00 | 7292.9 | 55450. | 7.6033 |
| 45 | 725.00 | 7217.0 | 55450. | 7.6832 |
| 621 | 725.00 | 7216.5 | 55450. | 7.6838 |
| 879 | 725.00 | 7184.6 | 55450. | 7.7179 |
| 303 | 725.00 | 7182.9 | 55450. | 7.7197 |
| 878 | 725.00 | 6996.7 | 55450. | 7.9252 |
| 302 | 725.00 | 6995.1 | 55450. | 7.9270 |
| 309 | 725.00 | 6989.7 | 55450. | 7.9330 |
| 885 | 725.00 | 6989.7 | 55450. | 7.9331 |
| 29 | 725.00 | 6816.7 | 55450. | 8.1344 |
| 605 | 725.00 | 6814.3 | 55450. | 8.1374 |
| 1002 | 725.00 | 6803.1 | 55450. | 8.1507 |
| 426 | 725.00 | 6796.5 | 55450. | 8.1586 |
| 1165 | 725.00 | 6737.1 | 55450. | 8.2306 |
| 160 | 725.00 | 6736.3 | 55450. | 8.2315 |
| 1153 | 725.00 | 6735.7 | 55450. | 8.2322 |
| 1044 | 725.00 | 6735.3 | 55450. | 8.2328 |
| 736 | 725.00 | 6734.9 | 55450. | 8.2332 |
| 468 | 725.00 | 6733.5 | 55450. | 8.2349 |
| 603 | 725.00 | 6725.8 | 55450. | 8.2444 |
| 27 | 725.00 | 6724.8 | 55450. | 8.2456 |
| 602 | 725.00 | 6705.2 | 55450. | 8.2697 |
| 26 | 725.00 | 6704.3 | 55450. | 8.2708 |
| 184 | 725.00 | 6642.7 | 55450. | 8.3475 |
| 760 | 725.00 | 6642.1 | 55450. | 8.3483 |
| 1020 | 725.00 | 6568.4 | 55450. | 8.4420 |
| 444 | 725.00 | 6568.0 | 55450. | 8.4424 |
| 601 | 725.00 | 6561.1 | 55450. | 8.4514 |
| 25 | 725.00 | 6560.6 | 55450. | 8.4520 |
| 376 | 725.00 | 6545.1 | 55450. | 8.4720 |
| 952 | 725.00 | 6544.7 | 55450. | 8.4725 |
| 1102 | 725.00 | 6523.8 | 55450. | 8.4996 |
| 526 | 725.00 | 6523.7 | 55450. | 8.4997 |
| 211 | 725.00 | 6515.6 | 55450. | 8.5103 |
| 787 | 725.00 | 6513.1 | 55450. | 8.5136 |
| 193 | 725.00 | 6499.3 | 55450. | 8.5317 |
| 769 | 725.00 | 6496.8 | 55450. | 8.5349 |
| 159 | 725.00 | 6470.9 | 55450. | 8.5692 |
| 735 | 725.00 | 6469.5 | 55450. | 8.5709 |
| 400 | 725.00 | 6391.5 | 55450. | 8.6755 |
| 976 | 725.00 | 6385.5 | 55450. | 8.6838 |
| 645 | 725.00 | 6311.6 | 55450. | 8.7854 |
| 69 | 725.00 | 6307.7 | 55450. | 8.7909 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 158 | 725.00 | 6205.4 | 55450. | 8.9357 |
| 734 | 725.00 | 6204.2 | 55450. | 8.9376 |
| 1043 | 725.00 | 6175.2 | 55450. | 8.9795 |
| 467 | 725.00 | 6173.4 | 55450. | 8.9820 |
| 212 | 725.00 | 6108.7 | 55450. | 9.0772 |
| 788 | 725.00 | 6106.3 | 55450. | 9.0808 |
| 1007 | 725.00 | 6088.3 | 55450. | 9.1076 |
| 431 | 725.00 | 6083.6 | 55450. | 9.1147 |
| 194 | 725.00 | 6033.3 | 55450. | 9.1906 |
| 770 | 725.00 | 6031.0 | 55450. | 9.1942 |
| 64 | 725.00 | 6004.0 | 55450. | 9.2354 |
| 640 | 725.00 | 6003.1 | 55450. | 9.2369 |
| 1223 | 725.00 | 5974.4 | 55450. | 9.2812 |
| 1228 | 725.00 | 5974.3 | 55450. | 9.2815 |
| 399 | 725.00 | 5957.8 | 55450. | 9.3071 |
| 975 | 725.00 | 5952.2 | 55450. | 9.3159 |
| 1063 | 725.00 | 5943.4 | 55450. | 9.3297 |
| 487 | 725.00 | 5942.0 | 55450. | 9.3319 |
| 259 | 725.00 | 5891.7 | 55450. | 9.4116 |
| 876 | 725.00 | 5891.6 | 55450. | 9.4117 |
| 835 | 725.00 | 5891.2 | 55450. | 9.4123 |
| 300 | 725.00 | 5889.7 | 55450. | 9.4147 |
| 814 | 725.00 | 5877.4 | 55450. | 9.4345 |
| 238 | 725.00 | 5876.0 | 55450. | 9.4366 |
| 351 | 725.00 | 5869.6 | 55450. | 9.4470 |
| 927 | 725.00 | 5860.8 | 55450. | 9.4612 |
| 1159 | 725.00 | 5847.2 | 55450. | 9.4832 |
| 1171 | 725.00 | 5846.1 | 55450. | 9.4849 |
| 350 | 725.00 | 5821.3 | 55450. | 9.5253 |
| 926 | 725.00 | 5812.8 | 55450. | 9.5393 |
| 715 | 725.00 | 5796.5 | 55450. | 9.5662 |
| 139 | 725.00 | 5791.0 | 55450. | 9.5752 |
| 870 | 725.00 | 5789.3 | 55450. | 9.5779 |
| 294 | 725.00 | 5789.2 | 55450. | 9.5782 |
| 869 | 725.00 | 5760.3 | 55450. | 9.6262 |
| 293 | 725.00 | 5760.2 | 55450. | 9.6264 |
| 597 | 725.00 | 5713.2 | 55450. | 9.7055 |
| 21 | 725.00 | 5712.7 | 55450. | 9.7064 |
| 260 | 725.00 | 5695.3 | 55450. | 9.7361 |
| 836 | 725.00 | 5694.9 | 55450. | 9.7368 |
| 716 | 725.00 | 5587.6 | 55450. | 9.9238 |
| 140 | 725.00 | 5582.3 | 55450. | 9.9331 |
| 726 | 725.00 | 5572.0 | 55450. | 9.9515 |
| 150 | 725.00 | 5571.4 | 55450. | 9.9526 |
| 112 | 725.00 | 5570.4 | 55450. | 9.9543 |
| 270 | 725.00 | 5563.9 | 55450. | 9.9660 |
| 688 | 725.00 | 5563.8 | 55450. | 9.9662 |
| 846 | 725.00 | 5563.2 | 55450. | 9.9674 |
| 277 | 725.00 | 5552.8 | 55450. | 9.9860 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 853 | 725.00 | 5552.0 | 55450. | 9.9875 |
| 398 | 725.00 | 5534.0 | 55450. | 10.020 |
| 974 | 725.00 | 5528.7 | 55450. | 10.029 |
| 28 | 725.00 | 5431.6 | 55450. | 10.209 |
| 604 | 725.00 | 5426.9 | 55450. | 10.218 |
| 471 | 725.00 | 5422.7 | 55450. | 10.225 |
| 1047 | 725.00 | 5421.2 | 55450. | 10.228 |
| 598 | 725.00 | 5395.0 | 55450. | 10.278 |
| 472 | 725.00 | 5394.8 | 55450. | 10.278 |
| 1048 | 725.00 | 5394.6 | 55450. | 10.279 |
| 22 | 725.00 | 5394.5 | 55450. | 10.279 |
| 88 | 725.00 | 5358.4 | 55450. | 10.348 |
| 664 | 725.00 | 5356.3 | 55450. | 10.352 |
| 725 | 725.00 | 5327.2 | 55450. | 10.409 |
| 149 | 725.00 | 5326.5 | 55450. | 10.410 |
| 349 | 725.00 | 5292.9 | 55450. | 10.476 |
| 925 | 725.00 | 5287.4 | 55450. | 10.487 |
| 754 | 725.00 | 5262.7 | 55450. | 10.536 |
| 178 | 725.00 | 5261.8 | 55450. | 10.538 |
| 334 | 725.00 | 5237.6 | 55450. | 10.587 |
| 910 | 725.00 | 5237.6 | 55450. | 10.587 |
| 111 | 725.00 | 5134.7 | 55450. | 10.799 |
| 687 | 725.00 | 5128.5 | 55450. | 10.812 |
| 278 | 725.00 | 5117.9 | 55450. | 10.834 |
| 854 | 725.00 | 5117.2 | 55450. | 10.836 |
| 156 | 725.00 | 5082.4 | 55450. | 10.910 |
| 732 | 725.00 | 5081.4 | 55450. | 10.912 |
| 87 | 725.00 | 5045.7 | 55450. | 10.990 |
| 663 | 725.00 | 5043.0 | 55450. | 10.995 |
| 46 | 725.00 | 4924.4 | 55450. | 11.260 |
| 622 | 725.00 | 4924.1 | 55450. | 11.261 |
| 76 | 725.00 | 4864.1 | 55450. | 11.400 |
| 652 | 725.00 | 4854.9 | 55450. | 11.422 |
| 58 | 725.00 | 4828.2 | 55450. | 11.485 |
| 634 | 725.00 | 4822.9 | 55450. | 11.497 |
| 646 | 725.00 | 4817.9 | 55450. | 11.509 |
| 70 | 725.00 | 4813.2 | 55450. | 11.520 |
| 348 | 725.00 | 4764.6 | 55450. | 11.638 |
| 924 | 725.00 | 4762.1 | 55450. | 11.644 |
| 59 | 725.00 | 4761.6 | 55450. | 11.645 |
| 948 | 725.00 | 4757.8 | 55450. | 11.654 |
| 635 | 725.00 | 4756.5 | 55450. | 11.658 |
| 372 | 725.00 | 4749.9 | 55450. | 11.674 |
| 937 | 725.00 | 4744.5 | 55450. | 11.687 |
| 361 | 725.00 | 4740.7 | 55450. | 11.697 |
| 110 | 725.00 | 4708.8 | 55450. | 11.776 |
| 686 | 725.00 | 4703.0 | 55450. | 11.790 |
| 868 | 725.00 | 4652.9 | 55450. | 11.917 |
| 292 | 725.00 | 4652.8 | 55450. | 11.918 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 77 | 725.00 | 4554.2 | 55450. | 12.175 |
| 653 | 725.00 | 4545.4 | 55450. | 12.199 |
| 148 | 725.00 | 4543.0 | 55450. | 12.205 |
| 724 | 725.00 | 4542.6 | 55450. | 12.207 |
| 16 | 725.00 | 4464.2 | 55450. | 12.421 |
| 592 | 725.00 | 4463.4 | 55450. | 12.423 |
| 947 | 725.00 | 4419.0 | 55450. | 12.548 |
| 371 | 725.00 | 4411.4 | 55450. | 12.570 |
| 288 | 725.00 | 4372.2 | 55450. | 12.682 |
| 864 | 725.00 | 4371.2 | 55450. | 12.685 |
| 923 | 725.00 | 4236.8 | 55450. | 13.088 |
| 347 | 725.00 | 4236.2 | 55450. | 13.090 |
| 1006 | 725.00 | 4209.1 | 55450. | 13.174 |
| 430 | 725.00 | 4206.7 | 55450. | 13.181 |
| 108 | 725.00 | 4188.4 | 55450. | 13.239 |
| 684 | 725.00 | 4180.4 | 55450. | 13.264 |
| 813 | 725.00 | 4177.0 | 55450. | 13.275 |
| 237 | 725.00 | 4175.7 | 55450. | 13.279 |
| 877 | 725.00 | 4149.3 | 55450. | 13.364 |
| 301 | 725.00 | 4148.8 | 55450. | 13.365 |
| 955 | 725.00 | 4137.0 | 55450. | 13.403 |
| 333 | 725.00 | 4131.1 | 55450. | 13.423 |
| 909 | 725.00 | 4130.6 | 55450. | 13.424 |
| 379 | 725.00 | 4128.8 | 55450. | 13.430 |
| 192 | 725.00 | 4103.4 | 55450. | 13.513 |
| 768 | 725.00 | 4101.5 | 55450. | 13.520 |
| 186 | 725.00 | 4081.9 | 55450. | 13.584 |
| 762 | 725.00 | 4080.0 | 55450. | 13.591 |
| 60 | 725.00 | 4032.2 | 55450. | 13.752 |
| 636 | 725.00 | 4030.1 | 55450. | 13.759 |
| 1206 | 725.00 | 3990.0 | 55450. | 13.897 |
| 1216 | 725.00 | 3982.2 | 55450. | 13.924 |
| 1098 | 725.00 | 3952.7 | 55450. | 14.029 |
| 522 | 725.00 | 3948.5 | 55450. | 14.043 |
| 1104 | 725.00 | 3944.5 | 55450. | 14.058 |
| 528 | 725.00 | 3940.3 | 55450. | 14.073 |
| 714 | 725.00 | 3872.0 | 55450. | 14.321 |
| 271 | 725.00 | 3871.3 | 55450. | 14.323 |
| 847 | 725.00 | 3871.0 | 55450. | 14.324 |
| 720 | 725.00 | 3867.4 | 55450. | 14.338 |
| 138 | 725.00 | 3865.5 | 55450. | 14.345 |
| 144 | 725.00 | 3860.8 | 55450. | 14.362 |
| 956 | 725.00 | 3845.3 | 55450. | 14.420 |
| 380 | 725.00 | 3837.5 | 55450. | 14.450 |
| 1003 | 725.00 | 3786.6 | 55450. | 14.644 |
| 427 | 725.00 | 3780.8 | 55450. | 14.666 |
| 1235 | 725.00 | 3757.2 | 55450. | 14.758 |
| 1240 | 725.00 | 3757.2 | 55450. | 14.758 |
| 717 | 725.00 | 3716.4 | 55450. | 14.920 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 141 | 725.00 | 3713.4 | 55450. | 14.932 |
| 922 | 725.00 | 3711.4 | 55450. | 14.940 |
| 346 | 725.00 | 3707.8 | 55450. | 14.955 |
| 133 | 725.00 | 3598.3 | 55450. | 15.410 |
| 709 | 725.00 | 3590.5 | 55450. | 15.444 |
| 396 | 725.00 | 3586.0 | 55450. | 15.463 |
| 1004 | 725.00 | 3583.2 | 55450. | 15.475 |
| 972 | 725.00 | 3578.5 | 55450. | 15.495 |
| 428 | 725.00 | 3577.6 | 55450. | 15.499 |
| 264 | 725.00 | 3574.3 | 55450. | 15.514 |
| 840 | 725.00 | 3573.8 | 55450. | 15.516 |
| 261 | 725.00 | 3545.2 | 55450. | 15.641 |
| 837 | 725.00 | 3545.1 | 55450. | 15.641 |
| 263 | 725.00 | 3384.3 | 55450. | 16.385 |
| 839 | 725.00 | 3383.8 | 55450. | 16.387 |
| 953 | 725.00 | 3361.8 | 55450. | 16.494 |
| 377 | 725.00 | 3359.8 | 55450. | 16.504 |
| 637 | 725.00 | 3303.7 | 55450. | 16.784 |
| 61 | 725.00 | 3302.8 | 55450. | 16.789 |
| 157 | 725.00 | 3299.4 | 55450. | 16.806 |
| 733 | 725.00 | 3299.0 | 55450. | 16.808 |
| 527 | 725.00 | 3276.5 | 55450. | 16.924 |
| 1103 | 725.00 | 3275.3 | 55450. | 16.930 |
| 1207 | 725.00 | 3257.1 | 55450. | 17.024 |
| 1217 | 725.00 | 3249.7 | 55450. | 17.063 |
| 385 | 725.00 | 3246.9 | 55450. | 17.078 |
| 961 | 725.00 | 3233.2 | 55450. | 17.150 |
| 789 | 725.00 | 3195.5 | 55450. | 17.353 |
| 213 | 725.00 | 3194.0 | 55450. | 17.361 |
| 384 | 725.00 | 3170.6 | 55450. | 17.489 |
| 1224 | 725.00 | 3168.1 | 55450. | 17.502 |
| 1229 | 725.00 | 3168.1 | 55450. | 17.503 |
| 960 | 725.00 | 3163.8 | 55450. | 17.527 |
| 378 | 725.00 | 3145.1 | 55450. | 17.630 |
| 954 | 725.00 | 3138.3 | 55450. | 17.669 |
| 761 | 725.00 | 3122.1 | 55450. | 17.760 |
| 185 | 725.00 | 3121.9 | 55450. | 17.761 |
| 966 | 725.00 | 3096.4 | 55450. | 17.908 |
| 390 | 725.00 | 3082.6 | 55450. | 17.988 |
| 1041 | 725.00 | 3026.2 | 55450. | 18.323 |
| 465 | 725.00 | 3024.6 | 55450. | 18.333 |
| 386 | 725.00 | 2972.9 | 55450. | 18.652 |
| 151 | 725.00 | 2961.1 | 55450. | 18.726 |
| 727 | 725.00 | 2959.9 | 55450. | 18.734 |
| 962 | 725.00 | 2959.8 | 55450. | 18.734 |
| 965 | 725.00 | 2828.9 | 55450. | 19.601 |
| 152 | 725.00 | 2816.7 | 55450. | 19.686 |
| 389 | 725.00 | 2815.7 | 55450. | 19.693 |
| 728 | 725.00 | 2815.6 | 55450. | 19.694 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 276 | 725.00 | 2808.1 | 55450. | 19.747 |
| 852 | 725.00 | 2806.8 | 55450. | 19.756 |
| 281 | 725.00 | 2800.3 | 55450. | 19.801 |
| 282 | 725.00 | 2800.3 | 55450. | 19.801 |
| 857 | 725.00 | 2799.8 | 55450. | 19.805 |
| 858 | 725.00 | 2799.8 | 55450. | 19.805 |
| 196 | 725.00 | 2776.1 | 55450. | 19.974 |
| 197 | 725.00 | 2776.1 | 55450. | 19.974 |
| 773 | 725.00 | 2774.0 | 55450. | 19.989 |
| 772 | 725.00 | 2774.0 | 55450. | 19.989 |
| 63 | 725.00 | 2755.9 | 55450. | 20.120 |
| 639 | 725.00 | 2747.7 | 55450. | 20.180 |
| 1040 | 725.00 | 2743.6 | 55450. | 20.210 |
| 464 | 725.00 | 2742.0 | 55450. | 20.222 |
| 62 | 725.00 | 2695.7 | 55450. | 20.570 |
| 638 | 725.00 | 2687.7 | 55450. | 20.631 |
| 763 | 725.00 | 2650.3 | 55450. | 20.922 |
| 187 | 725.00 | 2648.5 | 55450. | 20.936 |
| 275 | 725.00 | 2635.1 | 55450. | 21.043 |
| 851 | 725.00 | 2633.9 | 55450. | 21.052 |
| 623 | 725.00 | 2631.8 | 55450. | 21.069 |
| 47 | 725.00 | 2631.8 | 55450. | 21.070 |
| 198 | 725.00 | 2628.0 | 55450. | 21.100 |
| 774 | 725.00 | 2624.2 | 55450. | 21.130 |
| 1162 | 725.00 | 2624.0 | 55450. | 21.132 |
| 1174 | 725.00 | 2618.0 | 55450. | 21.180 |
| 109 | 725.00 | 2610.2 | 55450. | 21.244 |
| 867 | 725.00 | 2608.6 | 55450. | 21.256 |
| 291 | 725.00 | 2608.4 | 55450. | 21.258 |
| 685 | 725.00 | 2606.3 | 55450. | 21.275 |
| 1239 | 725.00 | 2594.6 | 55450. | 21.371 |
| 1234 | 725.00 | 2594.6 | 55450. | 21.371 |
| 729 | 725.00 | 2528.5 | 55450. | 21.930 |
| 153 | 725.00 | 2528.3 | 55450. | 21.932 |
| 1042 | 725.00 | 2521.4 | 55450. | 21.992 |
| 466 | 725.00 | 2519.8 | 55450. | 22.006 |
| 1190 | 725.00 | 2485.9 | 55450. | 22.306 |
| 1191 | 725.00 | 2485.9 | 55450. | 22.306 |
| 1189 | 725.00 | 2484.5 | 55450. | 22.318 |
| 460 | 725.00 | 2471.4 | 55450. | 22.437 |
| 1036 | 725.00 | 2470.0 | 55450. | 22.449 |
| 764 | 725.00 | 2411.6 | 55450. | 22.993 |
| 188 | 725.00 | 2409.9 | 55450. | 23.010 |
| 660 | 725.00 | 2371.6 | 55450. | 23.380 |
| 84 | 725.00 | 2363.7 | 55450. | 23.459 |
| 280 | 725.00 | 2350.7 | 55450. | 23.588 |
| 856 | 725.00 | 2350.5 | 55450. | 23.591 |
| 1005 | 725.00 | 2330.0 | 55450. | 23.799 |
| 429 | 725.00 | 2329.9 | 55450. | 23.800 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 946 | 725.00 | 2317.5 | 55450. | 23.926 |
| 370 | 725.00 | 2312.1 | 55450. | 23.982 |
| 461 | 725.00 | 2213.0 | 55450. | 25.056 |
| 1037 | 725.00 | 2211.7 | 55450. | 25.071 |
| 1186 | 725.00 | 2164.1 | 55450. | 25.623 |
| 1188 | 725.00 | 2163.9 | 55450. | 25.625 |
| 659 | 725.00 | 2152.7 | 55450. | 25.758 |
| 83 | 725.00 | 2145.1 | 55450. | 25.849 |
| 1187 | 725.00 | 2124.7 | 55450. | 26.098 |
| 583 | 725.00 | 2122.9 | 55450. | 26.120 |
| 7 | 725.00 | 2122.1 | 55450. | 26.129 |
| 613 | 725.00 | 2105.9 | 55450. | 26.330 |
| 37 | 725.00 | 2105.5 | 55450. | 26.336 |
| 48 | 725.00 | 2098.8 | 55450. | 26.419 |
| 624 | 725.00 | 2098.3 | 55450. | 26.427 |
| 42 | 725.00 | 2092.7 | 55450. | 26.497 |
| 618 | 725.00 | 2092.1 | 55450. | 26.505 |
| 945 | 725.00 | 2057.4 | 55450. | 26.951 |
| 719 | 725.00 | 2053.2 | 55450. | 27.007 |
| 369 | 725.00 | 2052.3 | 55450. | 27.018 |
| 143 | 725.00 | 2048.8 | 55450. | 27.065 |
| 848 | 725.00 | 2034.8 | 55450. | 27.251 |
| 272 | 725.00 | 2034.7 | 55450. | 27.252 |
| 397 | 725.00 | 2028.3 | 55450. | 27.338 |
| 973 | 725.00 | 2025.1 | 55450. | 27.382 |
| 517 | 725.00 | 1934.5 | 55450. | 28.664 |
| 1093 | 725.00 | 1927.4 | 55450. | 28.770 |
| 1209 | 725.00 | 1900.5 | 55450. | 29.176 |
| 1210 | 725.00 | 1900.5 | 55450. | 29.176 |
| 1195 | 725.00 | 1898.5 | 55450. | 29.208 |
| 1196 | 725.00 | 1898.5 | 55450. | 29.208 |
| 1197 | 725.00 | 1896.8 | 55450. | 29.234 |
| 1219 | 725.00 | 1896.2 | 55450. | 29.242 |
| 1220 | 725.00 | 1896.2 | 55450. | 29.242 |
| 718 | 725.00 | 1845.2 | 55450. | 30.051 |
| 142 | 725.00 | 1844.5 | 55450. | 30.062 |
| 614 | 725.00 | 1835.2 | 55450. | 30.215 |
| 38 | 725.00 | 1834.8 | 55450. | 30.221 |
| 191 | 725.00 | 1826.7 | 55450. | 30.356 |
| 767 | 725.00 | 1825.5 | 55450. | 30.375 |
| 944 | 725.00 | 1807.1 | 55450. | 30.685 |
| 78 | 725.00 | 1804.6 | 55450. | 30.727 |
| 368 | 725.00 | 1802.3 | 55450. | 30.766 |
| 654 | 725.00 | 1799.1 | 55450. | 30.820 |
| 957 | 725.00 | 1771.0 | 55450. | 31.310 |
| 381 | 725.00 | 1766.1 | 55450. | 31.397 |
| 279 | 725.00 | 1761.4 | 55450. | 31.481 |
| 855 | 725.00 | 1760.9 | 55450. | 31.489 |
| 195 | 725.00 | 1721.6 | 55450. | 32.209 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 771 | 725.00 | 1720.7 | 55450. | 32.225 |
| 518 | 725.00 | 1697.5 | 55450. | 32.666 |
| 1094 | 725.00 | 1690.6 | 55450. | 32.799 |
| 1208 | 725.00 | 1637.1 | 55450. | 33.871 |
| 1218 | 725.00 | 1636.5 | 55450. | 33.882 |
| 943 | 725.00 | 1443.1 | 55450. | 38.425 |
| 942 | 725.00 | 1443.1 | 55450. | 38.425 |
| 367 | 725.00 | 1441.7 | 55450. | 38.461 |
| 366 | 725.00 | 1441.7 | 55450. | 38.461 |
| 1238 | 725.00 | 1432.0 | 55450. | 38.721 |
| 1233 | 725.00 | 1432.0 | 55450. | 38.722 |
| 274 | 725.00 | 1421.7 | 55450. | 39.002 |
| 850 | 725.00 | 1420.8 | 55450. | 39.027 |
| 838 | 725.00 | 1395.3 | 55450. | 39.741 |
| 262 | 725.00 | 1395.2 | 55450. | 39.745 |
| 383 | 725.00 | 1366.0 | 55450. | 40.593 |
| 959 | 725.00 | 1362.1 | 55450. | 40.710 |
| 273 | 725.00 | 1248.8 | 55450. | 44.403 |
| 849 | 725.00 | 1247.9 | 55450. | 44.435 |
| 941 | 725.00 | 1187.1 | 55450. | 46.710 |
| 365 | 725.00 | 1182.3 | 55450. | 46.899 |
| 1097 | 725.00 | 1175.1 | 55450. | 47.188 |
| 521 | 725.00 | 1173.4 | 55450. | 47.256 |
| 40 | 725.00 | 1102.1 | 55450. | 50.314 |
| 39 | 725.00 | 1102.1 | 55450. | 50.314 |
| 616 | 725.00 | 1102.1 | 55450. | 50.315 |
| 615 | 725.00 | 1102.1 | 55450. | 50.315 |
| 617 | 725.00 | 1050.7 | 55450. | 52.776 |
| 41 | 725.00 | 1050.5 | 55450. | 52.784 |
| 1147 | 725.00 | 1007.6 | 55450. | 55.030 |
| 571 | 725.00 | 1007.6 | 55450. | 55.034 |
| 1232 | 725.00 | 894.20 | 55450. | 62.011 |
| 1237 | 725.00 | 894.14 | 55450. | 62.015 |
| 658 | 725.00 | 893.01 | 55450. | 62.093 |
| 82 | 725.00 | 887.59 | 55450. | 62.472 |
| 765 | 725.00 | 811.56 | 55450. | 68.325 |
| 189 | 725.00 | 810.56 | 55450. | 68.409 |
| 387 | 725.00 | 762.81 | 55450. | 72.692 |
| 963 | 725.00 | 756.28 | 55450. | 73.319 |
| 657 | 725.00 | 752.84 | 55450. | 73.655 |
| 964 | 725.00 | 749.86 | 55450. | 73.947 |
| 388 | 725.00 | 749.10 | 55450. | 74.022 |
| 81 | 725.00 | 747.73 | 55450. | 74.158 |
| 1096 | 725.00 | 694.35 | 55450. | 79.858 |
| 1095 | 725.00 | 694.35 | 55450. | 79.858 |
| 520 | 725.00 | 691.68 | 55450. | 80.167 |
| 519 | 725.00 | 691.68 | 55450. | 80.167 |
| 364 | 725.00 | 675.68 | 55450. | 82.065 |
| 940 | 725.00 | 666.47 | 55450. | 83.199 |

Table 2 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 958 | 725.00 | 665.71 | 55450. | 83.295 |
| 382 | 725.00 | 663.74 | 55450. | 83.542 |
| 656 | 725.00 | 622.48 | 55450. | 89.079 |
| 80 | 725.00 | 617.69 | 55450. | 89.770 |
| 190 | 725.00 | 518.96 | 55450. | 106.85 |
| 766 | 725.00 | 518.51 | 55450. | 106.94 |
| 462 | 725.00 | 511.11 | 55450. | 108.49 |
| 463 | 725.00 | 511.11 | 55450. | 108.49 |
| 1038 | 725.00 | 510.96 | 55450. | 108.52 |
| 1039 | 725.00 | 510.96 | 55450. | 108.52 |
| 79 | 725.00 | 387.31 | 55450. | 143.17 |
| 655 | 725.00 | 385.23 | 55450. | 143.94 |

FINITE ELEMENT ANALYSIS OF MPC-24E
(INPUT FILES AND RESULTS)

Table 3

TITLE=
MPC-24E Structural Analysis

SUBTITLE 1 =
Component: Enclosure Vessel
SUBTITLE 2 =
Load Combination: E2.a (See Table 2.1.7)
SUBTITLE 3 =
Stress Result: Primary Membrane (PM)

PRINT ELEMENT TABLE ITEMS PER ELEMENT

| STAT ELEM | CURRENT REF TEMP | MIXED PM | PREVIOUS ALLOW | PREVIOUS SF |
|---|---|---|---|---|
| 1354 | 450.00 | 6585.8 | 43450. | 6.5976 |
| 1355 | 450.00 | 6585.7 | 43450. | 6.5976 |
| 1353 | 450.00 | 6584.4 | 43450. | 6.5989 |
| 1356 | 450.00 | 6584.2 | 43450. | 6.5991 |
| 1349 | 450.00 | 6583.9 | 43450. | 6.5994 |
| 1350 | 450.00 | 6583.5 | 43450. | 6.5998 |
| 1348 | 450.00 | 6583.0 | 43450. | 6.6004 |
| 1352 | 450.00 | 6581.5 | 43450. | 6.6019 |
| 1357 | 450.00 | 6581.4 | 43450. | 6.6019 |
| 1351 | 450.00 | 6581.4 | 43450. | 6.6020 |
| 1347 | 450.00 | 6580.6 | 43450. | 6.6027 |
| 1361 | 450.00 | 6578.0 | 43450. | 6.6053 |
| 1358 | 450.00 | 6577.3 | 43450. | 6.6061 |
| 1346 | 450.00 | 6576.9 | 43450. | 6.6064 |
| 1362 | 450.00 | 6576.4 | 43450. | 6.6070 |
| 1342 | 450.00 | 6575.6 | 43450. | 6.6078 |
| 1345 | 450.00 | 6571.9 | 43450. | 6.6115 |
| 1359 | 450.00 | 6571.8 | 43450. | 6.6116 |
| 1363 | 450.00 | 6568.3 | 43450. | 6.6151 |
| 1344 | 450.00 | 6568.1 | 43450. | 6.6154 |
| 1360 | 450.00 | 6567.8 | 43450. | 6.6156 |
| 1341 | 450.00 | 6567.7 | 43450. | 6.6157 |
| 1343 | 450.00 | 6563.8 | 43450. | 6.6197 |
| 1364 | 450.00 | 6558.8 | 43450. | 6.6247 |
| 1340 | 450.00 | 6558.6 | 43450. | 6.6249 |
| 1339 | 450.00 | 6548.0 | 43450. | 6.6356 |
| 1365 | 450.00 | 6547.8 | 43450. | 6.6358 |
| 1338 | 450.00 | 6536.0 | 43450. | 6.6478 |
| 1366 | 450.00 | 6535.4 | 43450. | 6.6484 |
| 1337 | 450.00 | 6522.7 | 43450. | 6.6614 |
| 1367 | 450.00 | 6521.8 | 43450. | 6.6623 |
| 1336 | 450.00 | 6508.1 | 43450. | 6.6763 |
| 1368 | 450.00 | 6507.0 | 43450. | 6.6774 |
| 1335 | 450.00 | 6492.4 | 43450. | 6.6924 |
| 1369 | 450.00 | 6491.4 | 43450. | 6.6935 |

Table 3 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1370 | 450.00 | 6482.2 | 43450. | 6.7030 |
| 1334 | 450.00 | 6479.9 | 43450. | 6.7053 |
| 1371 | 450.00 | 6472.7 | 43450. | 6.7128 |
| 1333 | 450.00 | 6467.1 | 43450. | 6.7186 |
| 1372 | 450.00 | 6462.9 | 43450. | 6.7230 |
| 1332 | 450.00 | 6453.8 | 43450. | 6.7325 |
| 1373 | 450.00 | 6452.8 | 43450. | 6.7335 |
| 1331 | 450.00 | 6435.5 | 43450. | 6.7516 |
| 1374 | 450.00 | 6434.5 | 43450. | 6.7527 |
| 1330 | 450.00 | 6416.5 | 43450. | 6.7716 |
| 1375 | 450.00 | 6415.7 | 43450. | 6.7725 |
| 1329 | 450.00 | 6397.0 | 43450. | 6.7922 |
| 1376 | 450.00 | 6396.5 | 43450. | 6.7927 |
| 1328 | 450.00 | 6377.3 | 43450. | 6.8133 |
| 1377 | 450.00 | 6377.2 | 43450. | 6.8133 |
| 1378 | 450.00 | 6357.9 | 43450. | 6.8340 |
| 1327 | 450.00 | 6357.4 | 43450. | 6.8346 |
| 1379 | 450.00 | 6338.6 | 43450. | 6.8548 |
| 1326 | 450.00 | 6337.5 | 43450. | 6.8561 |
| 1380 | 450.00 | 6318.9 | 43450. | 6.8762 |
| 1325 | 450.00 | 6317.8 | 43450. | 6.8774 |
| 1381 | 450.00 | 6313.2 | 43450. | 6.8824 |
| 1324 | 450.00 | 6312.3 | 43450. | 6.8834 |
| 1382 | 450.00 | 6301.8 | 43450. | 6.8949 |
| 1323 | 450.00 | 6301.7 | 43450. | 6.8950 |
| 1322 | 450.00 | 6290.2 | 43450. | 6.9076 |
| 1383 | 450.00 | 6288.9 | 43450. | 6.9090 |
| 1321 | 450.00 | 6269.7 | 43450. | 6.9302 |
| 1384 | 450.00 | 6268.8 | 43450. | 6.9312 |
| 1320 | 450.00 | 6249.3 | 43450. | 6.9528 |
| 1385 | 450.00 | 6249.3 | 43450. | 6.9528 |
| 1386 | 450.00 | 6230.6 | 43450. | 6.9736 |
| 1319 | 450.00 | 6229.7 | 43450. | 6.9747 |
| 1387 | 450.00 | 6212.8 | 43450. | 6.9936 |
| 1318 | 450.00 | 6210.8 | 43450. | 6.9958 |
| 1388 | 450.00 | 6193.6 | 43450. | 7.0153 |
| 1317 | 450.00 | 6192.9 | 43450. | 7.0161 |
| 1316 | 450.00 | 6173.7 | 43450. | 7.0379 |
| 1389 | 450.00 | 6173.0 | 43450. | 7.0387 |
| 1315 | 450.00 | 6161.5 | 43450. | 7.0519 |
| 1390 | 450.00 | 6161.5 | 43450. | 7.0519 |
| 1241 | 450.00 | 6150.7 | 43450. | 7.0643 |
| 1314 | 450.00 | 6149.9 | 43450. | 7.0651 |
| 1313 | 450.00 | 6130.7 | 43450. | 7.0872 |
| 1242 | 450.00 | 6129.8 | 43450. | 7.0883 |
| 1312 | 450.00 | 6109.9 | 43450. | 7.1114 |
| 1243 | 450.00 | 6107.2 | 43450. | 7.1146 |
| 1311 | 450.00 | 6087.4 | 43450. | 7.1377 |
| 1244 | 450.00 | 6086.1 | 43450. | 7.1392 |

Table 3 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1245 | 450.00 | 6066.9 | 43450. | 7.1618 |
| 1310 | 450.00 | 6066.5 | 43450. | 7.1623 |
| 1246 | 450.00 | 6049.5 | 43450. | 7.1824 |
| 1309 | 450.00 | 6047.5 | 43450. | 7.1848 |
| 1247 | 450.00 | 6033.3 | 43450. | 7.2017 |
| 1308 | 450.00 | 6030.3 | 43450. | 7.2052 |
| 1248 | 450.00 | 6021.8 | 43450. | 7.2155 |
| 1307 | 450.00 | 6021.7 | 43450. | 7.2156 |
| 1306 | 450.00 | 6010.2 | 43450. | 7.2293 |
| 1249 | 450.00 | 6007.1 | 43450. | 7.2331 |
| 1305 | 450.00 | 6000.5 | 43450. | 7.2411 |
| 1250 | 450.00 | 4822.5 | 43450. | 9.0098 |
| 1251 | 450.00 | 4808.0 | 43450. | 9.0370 |
| 1304 | 450.00 | 4802.1 | 43450. | 9.0481 |
| 1303 | 450.00 | 4788.2 | 43450. | 9.0744 |
| 1252 | 450.00 | 4786.3 | 43450. | 9.0779 |
| 1302 | 450.00 | 4767.0 | 43450. | 9.1147 |
| 1253 | 450.00 | 4756.9 | 43450. | 9.1341 |
| 1301 | 450.00 | 4738.0 | 43450. | 9.1705 |
| 1254 | 450.00 | 4734.0 | 43450. | 9.1782 |
| 1255 | 450.00 | 4717.9 | 43450. | 9.2097 |
| 1300 | 450.00 | 4715.6 | 43450. | 9.2141 |
| 1256 | 450.00 | 4708.6 | 43450. | 9.2279 |
| 1299 | 450.00 | 4700.0 | 43450. | 9.2448 |
| 1257 | 450.00 | 4698.0 | 43450. | 9.2486 |
| 1298 | 450.00 | 4691.2 | 43450. | 9.2620 |
| 1297 | 450.00 | 4689.1 | 43450. | 9.2662 |
| 1258 | 450.00 | 4688.0 | 43450. | 9.2683 |
| 1296 | 450.00 | 4682.1 | 43450. | 9.2799 |
| 1259 | 450.00 | 4679.9 | 43450. | 9.2844 |
| 1295 | 450.00 | 4677.4 | 43450. | 9.2893 |
| 1294 | 450.00 | 4670.8 | 43450. | 9.3025 |
| 1277 | 450.00 | -3996.7 | 43450. | 10.871 |
| 1276 | 450.00 | -3996.6 | 43450. | 10.872 |
| 1281 | 450.00 | -3904.2 | 43450. | 11.129 |
| 1272 | 450.00 | -3900.6 | 43450. | 11.139 |
| 1282 | 450.00 | -3900.2 | 43450. | 11.140 |
| 1271 | 450.00 | -3895.7 | 43450. | 11.153 |
| 1280 | 450.00 | -3891.6 | 43450. | 11.165 |
| 1273 | 450.00 | -3888.8 | 43450. | 11.173 |
| 1283 | 450.00 | -3879.5 | 43450. | 11.200 |
| 1270 | 450.00 | -3874.1 | 43450. | 11.216 |
| 1278 | 450.00 | -3870.8 | 43450. | 11.225 |
| 1275 | 450.00 | -3869.8 | 43450. | 11.228 |
| 1279 | 450.00 | -3862.2 | 43450. | 11.250 |
| 1274 | 450.00 | -3860.3 | 43450. | 11.255 |
| 1285 | 450.00 | -3601.7 | 43450. | 12.064 |
| 1268 | 450.00 | -3597.6 | 43450. | 12.077 |
| 1284 | 450.00 | -3596.6 | 43450. | 12.081 |

Table 3 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1269 | 450.00 | -3592.8 | 43450. | 12.093 |
| 1260 | 450.00 | 1942.4 | 43450. | 22.369 |
| 1293 | 450.00 | 1926.9 | 43450. | 22.549 |
| 1261 | 450.00 | 1908.7 | 43450. | 22.765 |
| 1264 | 450.00 | 1895.8 | 43450. | 22.919 |
| 1292 | 450.00 | 1894.3 | 43450. | 22.938 |
| 1265 | 450.00 | 1891.7 | 43450. | 22.968 |
| 1262 | 450.00 | 1889.5 | 43450. | 22.995 |
| 1263 | 450.00 | 1885.2 | 43450. | 23.048 |
| 1289 | 450.00 | 1885.0 | 43450. | 23.051 |
| 1288 | 450.00 | 1882.0 | 43450. | 23.087 |
| 1291 | 450.00 | 1876.3 | 43450. | 23.157 |
| 1290 | 450.00 | 1873.2 | 43450. | 23.196 |
| 1266 | 450.00 | 1872.4 | 43450. | 23.205 |
| 1287 | 450.00 | 1863.6 | 43450. | 23.315 |
| 1267 | 450.00 | 1855.2 | 43450. | 23.421 |
| 1286 | 450.00 | 1852.5 | 43450. | 23.454 |

Table 4

TITLE=
MPC-24E Structural Analysis

SUBTITLE 1 =
Component: Enclosure Vessel
SUBTITLE 2 =
Load Combination: E2.a (See Table 2.1.7)
SUBTITLE 3 =
Stress Result: Primary Local Plus Primary Bending (PL+PB)

PRINT ELEMENT TABLE ITEMS PER ELEMENT

| STAT ELEM | CURRENT REF TEMP | MIXED PL+PB | PREVIOUS ALLOW | PREVIOUS SF |
|---|---|---|---|---|
| 1268 | 450.00 | 23100. | 65200. | 2.8225 |
| 1285 | 450.00 | 23097. | 65200. | 2.8229 |
| 1269 | 450.00 | 23091. | 65200. | 2.8236 |
| 1284 | 450.00 | 23088. | 65200. | 2.8240 |
| 1278 | 450.00 | 20707. | 65200. | 3.1486 |
| 1275 | 450.00 | 20707. | 65200. | 3.1488 |
| 1279 | 450.00 | 20700. | 65200. | 3.1498 |
| 1274 | 450.00 | 20699. | 65200. | 3.1499 |
| 1281 | 450.00 | 15602. | 65200. | 4.1791 |
| 1282 | 450.00 | 15601. | 65200. | 4.1791 |
| 1272 | 450.00 | 15601. | 65200. | 4.1792 |
| 1271 | 450.00 | 15601. | 65200. | 4.1793 |
| 1280 | 450.00 | 12512. | 65200. | 5.2110 |
| 1273 | 450.00 | 12512. | 65200. | 5.2110 |
| 1288 | 450.00 | 12292. | 65200. | 5.3043 |
| 1289 | 450.00 | 12285. | 65200. | 5.3073 |
| 1283 | 450.00 | 12218. | 65200. | 5.3362 |
| 1270 | 450.00 | 12217. | 65200. | 5.3367 |
| 1265 | 450.00 | 12179. | 65200. | 5.3535 |
| 1264 | 450.00 | 12172. | 65200. | 5.3565 |
| 1294 | 450.00 | 11921. | 65200. | 5.4692 |
| 1295 | 450.00 | 11919. | 65200. | 5.4701 |
| 1259 | 450.00 | 11627. | 65200. | 5.6075 |
| 1292 | 450.00 | 10655. | 65200. | 6.1190 |
| 1291 | 450.00 | 10650. | 65200. | 6.1220 |
| 1261 | 450.00 | 10485. | 65200. | 6.2185 |
| 1262 | 450.00 | 10479. | 65200. | 6.2217 |
| 1258 | 450.00 | 10251. | 65200. | 6.3607 |
| 1290 | 450.00 | 9911.8 | 65200. | 6.5780 |
| 1296 | 450.00 | 9837.0 | 65200. | 6.6280 |
| 1263 | 450.00 | 9835.2 | 65200. | 6.6293 |
| 1276 | 450.00 | 9380.7 | 65200. | 6.9504 |
| 1277 | 450.00 | 9380.4 | 65200. | 6.9507 |
| 1303 | 450.00 | 9259.2 | 65200. | 7.0417 |
| 1302 | 450.00 | 9258.0 | 65200. | 7.0426 |

Table 4 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1251 | 450.00 | 9175.5 | 65200. | 7.1059 |
| 1252 | 450.00 | 9174.3 | 65200. | 7.1068 |
| 1353 | 450.00 | 8938.2 | 65200. | 7.2945 |
| 1350 | 450.00 | 8937.6 | 65200. | 7.2950 |
| 1352 | 450.00 | 8935.0 | 65200. | 7.2971 |
| 1351 | 450.00 | 8934.5 | 65200. | 7.2976 |
| 1260 | 450.00 | 8901.4 | 65200. | 7.3247 |
| 1257 | 450.00 | 8578.9 | 65200. | 7.6001 |
| 1297 | 450.00 | 8561.9 | 65200. | 7.6151 |
| 1293 | 450.00 | 8542.5 | 65200. | 7.6324 |
| 1256 | 450.00 | 8329.4 | 65200. | 7.8277 |
| 1299 | 450.00 | 8328.1 | 65200. | 7.8289 |
| 1300 | 450.00 | 8325.7 | 65200. | 7.8312 |
| 1255 | 450.00 | 8213.7 | 65200. | 7.9379 |
| 1254 | 450.00 | 8211.2 | 65200. | 7.9404 |
| 1327 | 450.00 | 8181.7 | 65200. | 7.9690 |
| 1328 | 450.00 | 8181.6 | 65200. | 7.9691 |
| 1377 | 450.00 | 8181.1 | 65200. | 7.9696 |
| 1376 | 450.00 | 8181.0 | 65200. | 7.9696 |
| 1329 | 450.00 | 8129.4 | 65200. | 8.0203 |
| 1375 | 450.00 | 8129.1 | 65200. | 8.0205 |
| 1364 | 450.00 | 8113.3 | 65200. | 8.0362 |
| 1365 | 450.00 | 8113.1 | 65200. | 8.0364 |
| 1339 | 450.00 | 8112.8 | 65200. | 8.0367 |
| 1338 | 450.00 | 8112.6 | 65200. | 8.0369 |
| 1363 | 450.00 | 8110.6 | 65200. | 8.0389 |
| 1340 | 450.00 | 8109.5 | 65200. | 8.0400 |
| 1301 | 450.00 | 8091.4 | 65200. | 8.0580 |
| 1298 | 450.00 | 8082.1 | 65200. | 8.0672 |
| 1253 | 450.00 | 8042.9 | 65200. | 8.1066 |
| 1326 | 450.00 | 8032.1 | 65200. | 8.1174 |
| 1378 | 450.00 | 8031.1 | 65200. | 8.1185 |
| 1337 | 450.00 | 7960.0 | 65200. | 8.1910 |
| 1366 | 450.00 | 7960.0 | 65200. | 8.1910 |
| 1362 | 450.00 | 7929.1 | 65200. | 8.2229 |
| 1341 | 450.00 | 7927.3 | 65200. | 8.2248 |
| 1374 | 450.00 | 7916.3 | 65200. | 8.2362 |
| 1330 | 450.00 | 7916.2 | 65200. | 8.2362 |
| 1354 | 450.00 | 7900.9 | 65200. | 8.2523 |
| 1349 | 450.00 | 7900.6 | 65200. | 8.2525 |
| 1248 | 450.00 | 7777.3 | 65200. | 8.3834 |
| 1247 | 450.00 | 7777.1 | 65200. | 8.3836 |
| 1306 | 450.00 | 7775.5 | 65200. | 8.3853 |
| 1307 | 450.00 | 7775.3 | 65200. | 8.3855 |
| 1336 | 450.00 | 7677.6 | 65200. | 8.4923 |
| 1367 | 450.00 | 7677.1 | 65200. | 8.4928 |
| 1325 | 450.00 | 7638.1 | 65200. | 8.5362 |
| 1379 | 450.00 | 7636.5 | 65200. | 8.5379 |
| 1373 | 450.00 | 7583.0 | 65200. | 8.5982 |

Table 4 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1331 | 450.00 | 7582.8 | 65200. | 8.5984 |
| 1361 | 450.00 | 7548.6 | 65200. | 8.6374 |
| 1342 | 450.00 | 7546.0 | 65200. | 8.6403 |
| 1358 | 450.00 | 7520.1 | 65200. | 8.6701 |
| 1359 | 450.00 | 7520.0 | 65200. | 8.6702 |
| 1345 | 450.00 | 7518.0 | 65200. | 8.6725 |
| 1344 | 450.00 | 7518.0 | 65200. | 8.6726 |
| 1360 | 450.00 | 7476.7 | 65200. | 8.7204 |
| 1343 | 450.00 | 7474.2 | 65200. | 8.7233 |
| 1357 | 450.00 | 7448.9 | 65200. | 8.7530 |
| 1346 | 450.00 | 7447.4 | 65200. | 8.7547 |
| 1313 | 450.00 | 7336.9 | 65200. | 8.8866 |
| 1241 | 450.00 | 7336.4 | 65200. | 8.8872 |
| 1312 | 450.00 | 7336.1 | 65200. | 8.8876 |
| 1242 | 450.00 | 7335.6 | 65200. | 8.8881 |
| 1335 | 450.00 | 7293.7 | 65200. | 8.9393 |
| 1368 | 450.00 | 7292.9 | 65200. | 8.9402 |
| 1309 | 450.00 | 7200.9 | 65200. | 9.0545 |
| 1310 | 450.00 | 7200.4 | 65200. | 9.0551 |
| 1245 | 450.00 | 7200.2 | 65200. | 9.0553 |
| 1244 | 450.00 | 7199.8 | 65200. | 9.0558 |
| 1356 | 450.00 | 7194.3 | 65200. | 9.0627 |
| 1347 | 450.00 | 7193.3 | 65200. | 9.0640 |
| 1319 | 450.00 | 7171.8 | 65200. | 9.0911 |
| 1320 | 450.00 | 7171.8 | 65200. | 9.0912 |
| 1385 | 450.00 | 7170.8 | 65200. | 9.0924 |
| 1384 | 450.00 | 7170.8 | 65200. | 9.0925 |
| 1372 | 450.00 | 7168.4 | 65200. | 9.0955 |
| 1332 | 450.00 | 7168.3 | 65200. | 9.0956 |
| 1316 | 450.00 | 7160.8 | 65200. | 9.1051 |
| 1388 | 450.00 | 7160.1 | 65200. | 9.1060 |
| 1317 | 450.00 | 7160.0 | 65200. | 9.1061 |
| 1387 | 450.00 | 7159.4 | 65200. | 9.1070 |
| 1311 | 450.00 | 7073.2 | 65200. | 9.2179 |
| 1243 | 450.00 | 7072.9 | 65200. | 9.2183 |
| 1348 | 450.00 | 7061.4 | 65200. | 9.2332 |
| 1355 | 450.00 | 7061.3 | 65200. | 9.2335 |
| 1321 | 450.00 | 7033.9 | 65200. | 9.2694 |
| 1383 | 450.00 | 7032.3 | 65200. | 9.2716 |
| 1324 | 450.00 | 6956.0 | 65200. | 9.3732 |
| 1380 | 450.00 | 6953.8 | 65200. | 9.3761 |
| 1318 | 450.00 | 6938.8 | 65200. | 9.3964 |
| 1386 | 450.00 | 6938.4 | 65200. | 9.3970 |
| 1371 | 450.00 | 6916.8 | 65200. | 9.4263 |
| 1305 | 450.00 | 6902.1 | 65200. | 9.4464 |
| 1249 | 450.00 | 6885.3 | 65200. | 9.4694 |
| 1286 | 450.00 | 6862.4 | 65200. | 9.5011 |
| 1267 | 450.00 | 6845.0 | 65200. | 9.5252 |
| 1334 | 450.00 | 6838.9 | 65200. | 9.5337 |

Table 4 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1369 | 450.00 | 6838.0 | 65200. | 9.5350 |
| 1333 | 450.00 | 6830.7 | 65200. | 9.5451 |
| 1314 | 450.00 | 6710.1 | 65200. | 9.7168 |
| 1390 | 450.00 | 6709.4 | 65200. | 9.7176 |
| 1323 | 450.00 | 6674.7 | 65200. | 9.7682 |
| 1381 | 450.00 | 6672.3 | 65200. | 9.7717 |
| 1246 | 450.00 | 6663.0 | 65200. | 9.7854 |
| 1308 | 450.00 | 6661.6 | 65200. | 9.7875 |
| 1315 | 450.00 | 6658.6 | 65200. | 9.7918 |
| 1370 | 450.00 | 6658.3 | 65200. | 9.7923 |
| 1389 | 450.00 | 6658.0 | 65200. | 9.7928 |
| 1322 | 450.00 | 6556.5 | 65200. | 9.9444 |
| 1382 | 450.00 | 6554.1 | 65200. | 9.9479 |
| 1304 | 450.00 | 5724.7 | 65200. | 11.389 |
| 1250 | 450.00 | 5707.5 | 65200. | 11.424 |
| 1287 | 450.00 | 5496.8 | 65200. | 11.861 |
| 1266 | 450.00 | 5451.9 | 65200. | 11.959 |

Table 5

TITLE=
MPC-24E Structural Analysis

SUBTITLE 1 =
Component: Fuel Basket
SUBTITLE 2 =
Load Combination: F2.b (See Table 2.1.6)
SUBTITLE 3 =
Stress Result: Primary Membrane (PM)

PRINT ELEMENT TABLE ITEMS PER ELEMENT

| STAT ELEM | CURRENT REF TEMP | CURRENT PM | PREVIOUS ALLOW | PREVIOUS SF |
|---|---|---|---|---|
| 558 | 725.00 | -7020.5 | 36950. | 5.2631 |
| 396 | 725.00 | -7020.5 | 36950. | 5.2631 |
| 559 | 725.00 | -7002.1 | 36950. | 5.2770 |
| 397 | 725.00 | -7002.1 | 36950. | 5.2770 |
| 560 | 725.00 | -6982.1 | 36950. | 5.2921 |
| 398 | 725.00 | -6982.1 | 36950. | 5.2921 |
| 561 | 725.00 | -6962.1 | 36950. | 5.3073 |
| 399 | 725.00 | -6962.1 | 36950. | 5.3073 |
| 562 | 725.00 | -6960.3 | 36950. | 5.3087 |
| 400 | 725.00 | -6960.3 | 36950. | 5.3087 |
| 563 | 725.00 | -6958.4 | 36950. | 5.3101 |
| 401 | 725.00 | -6958.4 | 36950. | 5.3101 |
| 564 | 725.00 | -6945.6 | 36950. | 5.3199 |
| 402 | 725.00 | -6945.6 | 36950. | 5.3199 |
| 1134 | 725.00 | -6677.4 | 36950. | 5.5336 |
| 108 | 725.00 | -6677.4 | 36950. | 5.5336 |
| 1135 | 725.00 | -6659.0 | 36950. | 5.5489 |
| 109 | 725.00 | -6659.0 | 36950. | 5.5489 |
| 1136 | 725.00 | -6639.0 | 36950. | 5.5656 |
| 110 | 725.00 | -6639.0 | 36950. | 5.5656 |
| 1137 | 725.00 | -6619.0 | 36950. | 5.5824 |
| 111 | 725.00 | -6619.0 | 36950. | 5.5824 |
| 1138 | 725.00 | -6617.2 | 36950. | 5.5840 |
| 112 | 725.00 | -6617.2 | 36950. | 5.5840 |
| 1139 | 725.00 | -6615.3 | 36950. | 5.5855 |
| 113 | 725.00 | -6615.3 | 36950. | 5.5855 |
| 1140 | 725.00 | -6602.5 | 36950. | 5.5964 |
| 114 | 725.00 | -6602.5 | 36950. | 5.5964 |
| 363 | 725.00 | -6175.3 | 36950. | 5.9835 |
| 441 | 725.00 | -6175.3 | 36950. | 5.9835 |
| 362 | 725.00 | -6173.5 | 36950. | 5.9852 |
| 440 | 725.00 | -6173.5 | 36950. | 5.9852 |
| 361 | 725.00 | -6160.7 | 36950. | 5.9977 |
| 439 | 725.00 | -6160.7 | 36950. | 5.9977 |
| 75 | 725.00 | -6123.7 | 36950. | 6.0340 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1017 | 725.00 | -6123.7 | 36950. | 6.0340 |
| 74 | 725.00 | -6121.8 | 36950. | 6.0358 |
| 1016 | 725.00 | -6121.8 | 36950. | 6.0358 |
| 1015 | 725.00 | -6109.0 | 36950. | 6.0484 |
| 73 | 725.00 | -6109.0 | 36950. | 6.0484 |
| 1014 | 725.00 | -5620.9 | 36950. | 6.5737 |
| 72 | 725.00 | -5620.9 | 36950. | 6.5737 |
| 1013 | 725.00 | -5618.7 | 36950. | 6.5763 |
| 71 | 725.00 | -5618.7 | 36950. | 6.5763 |
| 1012 | 725.00 | -5594.1 | 36950. | 6.6052 |
| 70 | 725.00 | -5594.1 | 36950. | 6.6052 |
| 1011 | 725.00 | -5569.5 | 36950. | 6.6344 |
| 69 | 725.00 | -5569.5 | 36950. | 6.6344 |
| 1010 | 725.00 | -5544.9 | 36950. | 6.6638 |
| 68 | 725.00 | -5544.9 | 36950. | 6.6638 |
| 67 | 725.00 | -5520.3 | 36950. | 6.6935 |
| 1009 | 725.00 | -5520.3 | 36950. | 6.6935 |
| 360 | 725.00 | -5487.5 | 36950. | 6.7334 |
| 438 | 725.00 | -5487.5 | 36950. | 6.7334 |
| 359 | 725.00 | -5485.3 | 36950. | 6.7362 |
| 437 | 725.00 | -5485.3 | 36950. | 6.7362 |
| 358 | 725.00 | -5460.7 | 36950. | 6.7666 |
| 436 | 725.00 | -5460.7 | 36950. | 6.7666 |
| 357 | 725.00 | -5436.1 | 36950. | 6.7972 |
| 435 | 725.00 | -5436.1 | 36950. | 6.7972 |
| 356 | 725.00 | -5411.5 | 36950. | 6.8281 |
| 434 | 725.00 | -5411.5 | 36950. | 6.8281 |
| 355 | 725.00 | -5386.9 | 36950. | 6.8593 |
| 433 | 725.00 | -5386.9 | 36950. | 6.8593 |
| 892 | 725.00 | -4681.8 | 36950. | 7.8923 |
| 10 | 725.00 | -4681.8 | 36950. | 7.8923 |
| 893 | 725.00 | -4679.5 | 36950. | 7.8961 |
| 11 | 725.00 | -4679.5 | 36950. | 7.8961 |
| 298 | 725.00 | -4674.4 | 36950. | 7.9047 |
| 316 | 725.00 | -4674.4 | 36950. | 7.9047 |
| 299 | 725.00 | -4672.2 | 36950. | 7.9085 |
| 317 | 725.00 | -4672.2 | 36950. | 7.9085 |
| 894 | 725.00 | -4654.9 | 36950. | 7.9378 |
| 12 | 725.00 | -4654.9 | 36950. | 7.9378 |
| 300 | 725.00 | -4647.6 | 36950. | 7.9504 |
| 318 | 725.00 | -4647.6 | 36950. | 7.9504 |
| 13 | 725.00 | -4630.3 | 36950. | 7.9800 |
| 895 | 725.00 | -4630.3 | 36950. | 7.9800 |
| 301 | 725.00 | -4623.0 | 36950. | 7.9927 |
| 319 | 725.00 | -4623.0 | 36950. | 7.9927 |
| 896 | 725.00 | -4605.7 | 36950. | 8.0226 |
| 14 | 725.00 | -4605.7 | 36950. | 8.0226 |
| 302 | 725.00 | -4598.4 | 36950. | 8.0354 |
| 320 | 725.00 | -4598.4 | 36950. | 8.0354 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 15 | 725.00 | -4581.1 | 36950. | 8.0657 |
| 897 | 725.00 | -4581.1 | 36950. | 8.0657 |
| 898 | 725.00 | -4578.2 | 36950. | 8.0708 |
| 16 | 725.00 | -4578.2 | 36950. | 8.0708 |
| 17 | 725.00 | -4576.4 | 36950. | 8.0741 |
| 899 | 725.00 | -4576.4 | 36950. | 8.0741 |
| 303 | 725.00 | -4573.8 | 36950. | 8.0787 |
| 321 | 725.00 | -4573.8 | 36950. | 8.0787 |
| 18 | 725.00 | -4563.6 | 36950. | 8.0967 |
| 900 | 725.00 | -4563.6 | 36950. | 8.0967 |
| 304 | 725.00 | -4437.1 | 36950. | 8.3275 |
| 322 | 725.00 | -4437.1 | 36950. | 8.3275 |
| 305 | 725.00 | -4435.3 | 36950. | 8.3309 |
| 323 | 725.00 | -4435.3 | 36950. | 8.3309 |
| 324 | 725.00 | -4422.4 | 36950. | 8.3551 |
| 306 | 725.00 | -4422.4 | 36950. | 8.3551 |
| 364 | 725.00 | -4293.3 | 36950. | 8.6064 |
| 442 | 725.00 | -4293.3 | 36950. | 8.6064 |
| 365 | 725.00 | -4291.5 | 36950. | 8.6101 |
| 443 | 725.00 | -4291.5 | 36950. | 8.6101 |
| 366 | 725.00 | -4271.5 | 36950. | 8.6504 |
| 444 | 725.00 | -4271.5 | 36950. | 8.6504 |
| 367 | 725.00 | -4251.5 | 36950. | 8.6911 |
| 445 | 725.00 | -4251.5 | 36950. | 8.6911 |
| 368 | 725.00 | -4231.5 | 36950. | 8.7322 |
| 446 | 725.00 | -4231.5 | 36950. | 8.7322 |
| 390 | 725.00 | -4218.2 | 36950. | 8.7596 |
| 552 | 725.00 | -4218.2 | 36950. | 8.7596 |
| 389 | 725.00 | -4216.0 | 36950. | 8.7643 |
| 551 | 725.00 | -4216.0 | 36950. | 8.7643 |
| 369 | 725.00 | -4211.4 | 36950. | 8.7737 |
| 447 | 725.00 | -4211.4 | 36950. | 8.7737 |
| 370 | 725.00 | -4209.6 | 36950. | 8.7775 |
| 448 | 725.00 | -4209.6 | 36950. | 8.7775 |
| 371 | 725.00 | -4207.8 | 36950. | 8.7813 |
| 449 | 725.00 | -4207.8 | 36950. | 8.7813 |
| 372 | 725.00 | -4195.0 | 36950. | 8.8082 |
| 450 | 725.00 | -4195.0 | 36950. | 8.8082 |
| 388 | 725.00 | -4191.4 | 36950. | 8.8157 |
| 550 | 725.00 | -4191.4 | 36950. | 8.8157 |
| 387 | 725.00 | -4166.8 | 36950. | 8.8678 |
| 549 | 725.00 | -4166.8 | 36950. | 8.8678 |
| 386 | 725.00 | -4142.2 | 36950. | 8.9204 |
| 548 | 725.00 | -4142.2 | 36950. | 8.9204 |
| 1075 | 725.00 | -4136.5 | 36950. | 8.9327 |
| 193 | 725.00 | -4136.5 | 36950. | 8.9327 |
| 1076 | 725.00 | -4134.3 | 36950. | 8.9375 |
| 194 | 725.00 | -4134.3 | 36950. | 8.9375 |
| 385 | 725.00 | -4117.6 | 36950. | 8.9737 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 547 | 725.00 | -4117.6 | 36950. | 8.9737 |
| 1128 | 725.00 | -4110.0 | 36950. | 8.9903 |
| 102 | 725.00 | -4110.0 | 36950. | 8.9903 |
| 1077 | 725.00 | -4109.7 | 36950. | 8.9910 |
| 195 | 725.00 | -4109.7 | 36950. | 8.9910 |
| 1127 | 725.00 | -4107.7 | 36950. | 8.9952 |
| 101 | 725.00 | -4107.7 | 36950. | 8.9952 |
| 1078 | 725.00 | -4085.1 | 36950. | 9.0452 |
| 196 | 725.00 | -4085.1 | 36950. | 9.0452 |
| 1126 | 725.00 | -4083.1 | 36950. | 9.0494 |
| 100 | 725.00 | -4083.1 | 36950. | 9.0494 |
| 1079 | 725.00 | -4060.5 | 36950. | 9.1000 |
| 197 | 725.00 | -4060.5 | 36950. | 9.1000 |
| 1125 | 725.00 | -4058.5 | 36950. | 9.1043 |
| 99 | 725.00 | -4058.5 | 36950. | 9.1043 |
| 1124 | 725.00 | -4033.9 | 36950. | 9.1598 |
| 98 | 725.00 | -4033.9 | 36950. | 9.1598 |
| 1080 | 725.00 | -4032.4 | 36950. | 9.1632 |
| 198 | 725.00 | -4032.4 | 36950. | 9.1632 |
| 1123 | 725.00 | -4009.3 | 36950. | 9.2160 |
| 97 | 725.00 | -4009.3 | 36950. | 9.2160 |
| 1168 | 725.00 | -3925.2 | 36950. | 9.4134 |
| 1180 | 725.00 | -3925.2 | 36950. | 9.4134 |
| 1169 | 725.00 | -3923.4 | 36950. | 9.4178 |
| 1181 | 725.00 | -3923.4 | 36950. | 9.4178 |
| 499 | 725.00 | -3917.6 | 36950. | 9.4319 |
| 481 | 725.00 | -3917.6 | 36950. | 9.4319 |
| 500 | 725.00 | -3915.3 | 36950. | 9.4373 |
| 482 | 725.00 | -3915.3 | 36950. | 9.4373 |
| 1081 | 725.00 | -3913.0 | 36950. | 9.4428 |
| 199 | 725.00 | -3913.0 | 36950. | 9.4428 |
| 1082 | 725.00 | -3911.2 | 36950. | 9.4473 |
| 200 | 725.00 | -3911.2 | 36950. | 9.4473 |
| 1182 | 725.00 | -3910.6 | 36950. | 9.4487 |
| 1170 | 725.00 | -3910.6 | 36950. | 9.4487 |
| 1083 | 725.00 | -3901.1 | 36950. | 9.4716 |
| 201 | 725.00 | -3901.1 | 36950. | 9.4716 |
| 501 | 725.00 | -3890.7 | 36950. | 9.4970 |
| 483 | 725.00 | -3890.7 | 36950. | 9.4970 |
| 502 | 725.00 | -3866.1 | 36950. | 9.5574 |
| 484 | 725.00 | -3866.1 | 36950. | 9.5574 |
| 503 | 725.00 | -3841.5 | 36950. | 9.6186 |
| 485 | 725.00 | -3841.5 | 36950. | 9.6186 |
| 505 | 725.00 | -3818.2 | 36950. | 9.6775 |
| 487 | 725.00 | -3818.2 | 36950. | 9.6775 |
| 506 | 725.00 | -3816.3 | 36950. | 9.6821 |
| 488 | 725.00 | -3816.3 | 36950. | 9.6821 |
| 486 | 725.00 | -3813.5 | 36950. | 9.6893 |
| 504 | 725.00 | -3813.5 | 36950. | 9.6893 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 507 | 725.00 | -3806.3 | 36950. | 9.7077 |
| 489 | 725.00 | -3806.3 | 36950. | 9.7077 |
| 1018 | 725.00 | -3716.6 | 36950. | 9.9419 |
| 76 | 725.00 | -3716.6 | 36950. | 9.9419 |
| 1019 | 725.00 | -3714.8 | 36950. | 9.9468 |
| 77 | 725.00 | -3714.8 | 36950. | 9.9468 |
| 1020 | 725.00 | -3694.8 | 36950. | 10.001 |
| 78 | 725.00 | -3694.8 | 36950. | 10.001 |
| 1156 | 725.00 | -3683.6 | 36950. | 10.031 |
| 1192 | 725.00 | -3683.6 | 36950. | 10.031 |
| 1193 | 725.00 | -3681.8 | 36950. | 10.036 |
| 1157 | 725.00 | -3681.8 | 36950. | 10.036 |
| 1021 | 725.00 | -3674.8 | 36950. | 10.055 |
| 79 | 725.00 | -3674.8 | 36950. | 10.055 |
| 1158 | 725.00 | -3669.0 | 36950. | 10.071 |
| 1194 | 725.00 | -3669.0 | 36950. | 10.071 |
| 1022 | 725.00 | -3654.8 | 36950. | 10.110 |
| 80 | 725.00 | -3654.8 | 36950. | 10.110 |
| 1023 | 725.00 | -3634.7 | 36950. | 10.166 |
| 81 | 725.00 | -3634.7 | 36950. | 10.166 |
| 1024 | 725.00 | -3632.9 | 36950. | 10.171 |
| 82 | 725.00 | -3632.9 | 36950. | 10.171 |
| 1025 | 725.00 | -3631.1 | 36950. | 10.176 |
| 83 | 725.00 | -3631.1 | 36950. | 10.176 |
| 1026 | 725.00 | -3618.3 | 36950. | 10.212 |
| 84 | 725.00 | -3618.3 | 36950. | 10.212 |
| 891 | 725.00 | -3406.2 | 36950. | 10.848 |
| 9 | 725.00 | -3406.2 | 36950. | 10.848 |
| 890 | 725.00 | -3404.3 | 36950. | 10.854 |
| 8 | 725.00 | -3404.3 | 36950. | 10.854 |
| 889 | 725.00 | -3391.5 | 36950. | 10.895 |
| 7 | 725.00 | -3391.5 | 36950. | 10.895 |
| 612 | 725.00 | -3203.9 | 36950. | 11.533 |
| 594 | 725.00 | -3203.9 | 36950. | 11.533 |
| 593 | 725.00 | -3202.1 | 36950. | 11.539 |
| 611 | 725.00 | -3202.1 | 36950. | 11.539 |
| 592 | 725.00 | -3189.3 | 36950. | 11.586 |
| 610 | 725.00 | -3189.3 | 36950. | 11.586 |
| 930 | 725.00 | -3109.2 | 36950. | 11.884 |
| 180 | 725.00 | -3109.2 | 36950. | 11.884 |
| 929 | 725.00 | -3107.4 | 36950. | 11.891 |
| 179 | 725.00 | -3107.4 | 36950. | 11.891 |
| 297 | 725.00 | -3107.2 | 36950. | 11.892 |
| 315 | 725.00 | -3107.2 | 36950. | 11.892 |
| 296 | 725.00 | -3105.3 | 36950. | 11.899 |
| 314 | 725.00 | -3105.3 | 36950. | 11.899 |
| 468 | 725.00 | -3101.5 | 36950. | 11.914 |
| 354 | 725.00 | -3101.5 | 36950. | 11.914 |
| 467 | 725.00 | -3099.7 | 36950. | 11.921 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 353 | 725.00 | -3099.7 | 36950. | 11.921 |
| 928 | 725.00 | -3094.5 | 36950. | 11.940 |
| 178 | 725.00 | -3094.5 | 36950. | 11.940 |
| 295 | 725.00 | -3092.5 | 36950. | 11.948 |
| 313 | 725.00 | -3092.5 | 36950. | 11.948 |
| 466 | 725.00 | -3086.8 | 36950. | 11.970 |
| 352 | 725.00 | -3086.8 | 36950. | 11.970 |
| 882 | 725.00 | -2978.8 | 36950. | 12.404 |
| 36 | 725.00 | -2978.8 | 36950. | 12.404 |
| 881 | 725.00 | -2977.0 | 36950. | 12.412 |
| 35 | 725.00 | -2977.0 | 36950. | 12.412 |
| 34 | 725.00 | -2964.1 | 36950. | 12.466 |
| 880 | 725.00 | -2964.1 | 36950. | 12.466 |
| 888 | 725.00 | -2727.4 | 36950. | 13.548 |
| 6 | 725.00 | -2727.4 | 36950. | 13.548 |
| 887 | 725.00 | -2725.2 | 36950. | 13.559 |
| 5 | 725.00 | -2725.2 | 36950. | 13.559 |
| 886 | 725.00 | -2700.6 | 36950. | 13.682 |
| 4 | 725.00 | -2700.6 | 36950. | 13.682 |
| 885 | 725.00 | -2676.0 | 36950. | 13.808 |
| 3 | 725.00 | -2676.0 | 36950. | 13.808 |
| 884 | 725.00 | -2651.4 | 36950. | 13.936 |
| 2 | 725.00 | -2651.4 | 36950. | 13.936 |
| 883 | 725.00 | -2626.8 | 36950. | 14.067 |
| 1 | 725.00 | -2626.8 | 36950. | 14.067 |
| 294 | 725.00 | -2588.5 | 36950. | 14.275 |
| 312 | 725.00 | -2588.5 | 36950. | 14.275 |
| 293 | 725.00 | -2586.2 | 36950. | 14.287 |
| 311 | 725.00 | -2586.2 | 36950. | 14.287 |
| 1189 | 725.00 | -2585.5 | 36950. | 14.291 |
| 1153 | 725.00 | -2585.5 | 36950. | 14.291 |
| 1190 | 725.00 | -2583.7 | 36950. | 14.301 |
| 1154 | 725.00 | -2583.7 | 36950. | 14.301 |
| 465 | 725.00 | -2582.1 | 36950. | 14.310 |
| 351 | 725.00 | -2582.1 | 36950. | 14.310 |
| 464 | 725.00 | -2579.8 | 36950. | 14.323 |
| 350 | 725.00 | -2579.8 | 36950. | 14.323 |
| 1191 | 725.00 | -2570.8 | 36950. | 14.373 |
| 1155 | 725.00 | -2570.8 | 36950. | 14.373 |
| 292 | 725.00 | -2561.6 | 36950. | 14.424 |
| 310 | 725.00 | -2561.6 | 36950. | 14.424 |
| 463 | 725.00 | -2555.2 | 36950. | 14.461 |
| 349 | 725.00 | -2555.2 | 36950. | 14.461 |
| 291 | 725.00 | -2537.0 | 36950. | 14.564 |
| 309 | 725.00 | -2537.0 | 36950. | 14.564 |
| 462 | 725.00 | -2530.6 | 36950. | 14.601 |
| 348 | 725.00 | -2530.6 | 36950. | 14.601 |
| 290 | 725.00 | -2512.4 | 36950. | 14.707 |
| 308 | 725.00 | -2512.4 | 36950. | 14.707 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 461 | 725.00 | -2506.0 | 36950. | 14.744 |
| 347 | 725.00 | -2506.0 | 36950. | 14.744 |
| 591 | 725.00 | -2503.4 | 36950. | 14.760 |
| 609 | 725.00 | -2503.4 | 36950. | 14.760 |
| 590 | 725.00 | -2501.2 | 36950. | 14.773 |
| 608 | 725.00 | -2501.2 | 36950. | 14.773 |
| 289 | 725.00 | -2487.8 | 36950. | 14.852 |
| 307 | 725.00 | -2487.8 | 36950. | 14.852 |
| 879 | 725.00 | -2481.6 | 36950. | 14.889 |
| 33 | 725.00 | -2481.6 | 36950. | 14.889 |
| 460 | 725.00 | -2481.4 | 36950. | 14.891 |
| 346 | 725.00 | -2481.4 | 36950. | 14.891 |
| 878 | 725.00 | -2479.4 | 36950. | 14.903 |
| 32 | 725.00 | -2479.4 | 36950. | 14.903 |
| 589 | 725.00 | -2476.6 | 36950. | 14.920 |
| 607 | 725.00 | -2476.6 | 36950. | 14.920 |
| 877 | 725.00 | -2454.8 | 36950. | 15.052 |
| 31 | 725.00 | -2454.8 | 36950. | 15.052 |
| 588 | 725.00 | -2452.0 | 36950. | 15.070 |
| 606 | 725.00 | -2452.0 | 36950. | 15.070 |
| 927 | 725.00 | -2448.3 | 36950. | 15.092 |
| 177 | 725.00 | -2448.3 | 36950. | 15.092 |
| 926 | 725.00 | -2446.1 | 36950. | 15.106 |
| 176 | 725.00 | -2446.1 | 36950. | 15.106 |
| 876 | 725.00 | -2430.2 | 36950. | 15.205 |
| 30 | 725.00 | -2430.2 | 36950. | 15.205 |
| 605 | 725.00 | -2427.4 | 36950. | 15.222 |
| 587 | 725.00 | -2427.4 | 36950. | 15.222 |
| 925 | 725.00 | -2421.5 | 36950. | 15.259 |
| 175 | 725.00 | -2421.5 | 36950. | 15.259 |
| 875 | 725.00 | -2405.6 | 36950. | 15.360 |
| 29 | 725.00 | -2405.6 | 36950. | 15.360 |
| 586 | 725.00 | -2402.8 | 36950. | 15.378 |
| 604 | 725.00 | -2402.8 | 36950. | 15.378 |
| 924 | 725.00 | -2396.9 | 36950. | 15.416 |
| 174 | 725.00 | -2396.9 | 36950. | 15.416 |
| 874 | 725.00 | -2381.0 | 36950. | 15.519 |
| 28 | 725.00 | -2381.0 | 36950. | 15.519 |
| 1159 | 725.00 | -2376.6 | 36950. | 15.548 |
| 1195 | 725.00 | -2376.6 | 36950. | 15.548 |
| 1196 | 725.00 | -2374.7 | 36950. | 15.560 |
| 1160 | 725.00 | -2374.7 | 36950. | 15.560 |
| 923 | 725.00 | -2372.3 | 36950. | 15.576 |
| 173 | 725.00 | -2372.3 | 36950. | 15.576 |
| 1161 | 725.00 | -2361.9 | 36950. | 15.644 |
| 1197 | 725.00 | -2361.9 | 36950. | 15.644 |
| 922 | 725.00 | -2347.7 | 36950. | 15.739 |
| 172 | 725.00 | -2347.7 | 36950. | 15.739 |
| 1165 | 725.00 | -2257.9 | 36950. | 16.365 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1177 | 725.00 | -2257.9 | 36950. | 16.365 |
| 1166 | 725.00 | -2256.1 | 36950. | 16.378 |
| 1178 | 725.00 | -2256.1 | 36950. | 16.378 |
| 1167 | 725.00 | -2243.3 | 36950. | 16.471 |
| 1179 | 725.00 | -2243.3 | 36950. | 16.471 |
| 1171 | 725.00 | -2238.7 | 36950. | 16.505 |
| 1183 | 725.00 | -2238.7 | 36950. | 16.505 |
| 1172 | 725.00 | -2236.9 | 36950. | 16.519 |
| 1184 | 725.00 | -2236.9 | 36950. | 16.519 |
| 1173 | 725.00 | -2224.0 | 36950. | 16.614 |
| 1185 | 725.00 | -2224.0 | 36950. | 16.614 |
| 595 | 725.00 | -1962.4 | 36950. | 18.829 |
| 577 | 725.00 | -1962.4 | 36950. | 18.829 |
| 596 | 725.00 | -1960.2 | 36950. | 18.850 |
| 578 | 725.00 | -1960.2 | 36950. | 18.850 |
| 597 | 725.00 | -1935.6 | 36950. | 19.090 |
| 579 | 725.00 | -1935.6 | 36950. | 19.090 |
| 598 | 725.00 | -1911.0 | 36950. | 19.335 |
| 580 | 725.00 | -1911.0 | 36950. | 19.335 |
| 599 | 725.00 | -1886.4 | 36950. | 19.588 |
| 581 | 725.00 | -1886.4 | 36950. | 19.588 |
| 600 | 725.00 | -1861.8 | 36950. | 19.846 |
| 582 | 725.00 | -1861.8 | 36950. | 19.846 |
| 601 | 725.00 | -1836.9 | 36950. | 20.116 |
| 583 | 725.00 | -1836.9 | 36950. | 20.116 |
| 602 | 725.00 | -1835.1 | 36950. | 20.136 |
| 584 | 725.00 | -1835.1 | 36950. | 20.136 |
| 603 | 725.00 | -1822.2 | 36950. | 20.277 |
| 585 | 725.00 | -1822.2 | 36950. | 20.277 |
| 1036 | 725.00 | -1744.0 | 36950. | 21.187 |
| 58 | 725.00 | -1744.0 | 36950. | 21.187 |
| 1037 | 725.00 | -1741.7 | 36950. | 21.215 |
| 59 | 725.00 | -1741.7 | 36950. | 21.215 |
| 1038 | 725.00 | -1717.1 | 36950. | 21.519 |
| 60 | 725.00 | -1717.1 | 36950. | 21.519 |
| 643 | 725.00 | -1707.1 | 36950. | 21.645 |
| 721 | 725.00 | -1707.1 | 36950. | 21.645 |
| 722 | 725.00 | -1704.8 | 36950. | 21.674 |
| 644 | 725.00 | -1704.8 | 36950. | 21.674 |
| 1039 | 725.00 | -1692.5 | 36950. | 21.831 |
| 61 | 725.00 | -1692.5 | 36950. | 21.831 |
| 723 | 725.00 | -1680.2 | 36950. | 21.991 |
| 645 | 725.00 | -1680.2 | 36950. | 21.991 |
| 1040 | 725.00 | -1667.9 | 36950. | 22.153 |
| 62 | 725.00 | -1667.9 | 36950. | 22.153 |
| 646 | 725.00 | -1655.6 | 36950. | 22.318 |
| 724 | 725.00 | -1655.6 | 36950. | 22.318 |
| 1041 | 725.00 | -1643.3 | 36950. | 22.485 |
| 63 | 725.00 | -1643.3 | 36950. | 22.485 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 725 | 725.00 | -1631.0 | 36950. | 22.655 |
| 647 | 725.00 | -1631.0 | 36950. | 22.655 |
| 648 | 725.00 | -1606.4 | 36950. | 23.002 |
| 726 | 725.00 | -1606.4 | 36950. | 23.002 |
| 634 | 725.00 | -1604.2 | 36950. | 23.034 |
| 748 | 725.00 | -1604.2 | 36950. | 23.034 |
| 635 | 725.00 | -1601.9 | 36950. | 23.066 |
| 749 | 725.00 | -1601.9 | 36950. | 23.066 |
| 64 | 725.00 | -1585.7 | 36950. | 23.302 |
| 1042 | 725.00 | -1585.7 | 36950. | 23.302 |
| 1043 | 725.00 | -1583.9 | 36950. | 23.329 |
| 65 | 725.00 | -1583.9 | 36950. | 23.329 |
| 636 | 725.00 | -1577.3 | 36950. | 23.426 |
| 750 | 725.00 | -1577.3 | 36950. | 23.426 |
| 66 | 725.00 | -1571.1 | 36950. | 23.519 |
| 1044 | 725.00 | -1571.1 | 36950. | 23.519 |
| 145 | 725.00 | -1566.1 | 36950. | 23.593 |
| 931 | 725.00 | -1566.1 | 36950. | 23.593 |
| 865 | 725.00 | -1564.8 | 36950. | 23.613 |
| 19 | 725.00 | -1564.8 | 36950. | 23.613 |
| 932 | 725.00 | -1563.9 | 36950. | 23.627 |
| 146 | 725.00 | -1563.9 | 36950. | 23.627 |
| 866 | 725.00 | -1562.6 | 36950. | 23.647 |
| 20 | 725.00 | -1562.6 | 36950. | 23.647 |
| 637 | 725.00 | -1552.7 | 36950. | 23.797 |
| 751 | 725.00 | -1552.7 | 36950. | 23.797 |
| 933 | 725.00 | -1539.3 | 36950. | 24.004 |
| 147 | 725.00 | -1539.3 | 36950. | 24.004 |
| 867 | 725.00 | -1538.0 | 36950. | 24.025 |
| 21 | 725.00 | -1538.0 | 36950. | 24.025 |
| 638 | 725.00 | -1528.1 | 36950. | 24.180 |
| 752 | 725.00 | -1528.1 | 36950. | 24.180 |
| 934 | 725.00 | -1514.7 | 36950. | 24.394 |
| 148 | 725.00 | -1514.7 | 36950. | 24.394 |
| 868 | 725.00 | -1513.4 | 36950. | 24.416 |
| 22 | 725.00 | -1513.4 | 36950. | 24.416 |
| 639 | 725.00 | -1503.5 | 36950. | 24.575 |
| 753 | 725.00 | -1503.5 | 36950. | 24.575 |
| 640 | 725.00 | -1496.8 | 36950. | 24.686 |
| 754 | 725.00 | -1496.8 | 36950. | 24.686 |
| 641 | 725.00 | -1495.0 | 36950. | 24.716 |
| 755 | 725.00 | -1495.0 | 36950. | 24.716 |
| 935 | 725.00 | -1490.1 | 36950. | 24.797 |
| 149 | 725.00 | -1490.1 | 36950. | 24.797 |
| 869 | 725.00 | -1488.8 | 36950. | 24.819 |
| 23 | 725.00 | -1488.8 | 36950. | 24.819 |
| 649 | 725.00 | -1487.5 | 36950. | 24.841 |
| 727 | 725.00 | -1487.5 | 36950. | 24.841 |
| 728 | 725.00 | -1485.6 | 36950. | 24.872 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 650 | 725.00 | -1485.6 | 36950. | 24.872 |
| 642 | 725.00 | -1482.1 | 36950. | 24.930 |
| 756 | 725.00 | -1482.1 | 36950. | 24.930 |
| 651 | 725.00 | -1472.8 | 36950. | 25.088 |
| 729 | 725.00 | -1472.8 | 36950. | 25.088 |
| 150 | 725.00 | -1465.5 | 36950. | 25.213 |
| 936 | 725.00 | -1465.5 | 36950. | 25.213 |
| 937 | 725.00 | -1464.6 | 36950. | 25.228 |
| 151 | 725.00 | -1464.6 | 36950. | 25.228 |
| 870 | 725.00 | -1464.2 | 36950. | 25.236 |
| 24 | 725.00 | -1464.2 | 36950. | 25.236 |
| 938 | 725.00 | -1462.8 | 36950. | 25.260 |
| 152 | 725.00 | -1462.8 | 36950. | 25.260 |
| 153 | 725.00 | -1450.0 | 36950. | 25.483 |
| 939 | 725.00 | -1450.0 | 36950. | 25.483 |
| 871 | 725.00 | -1347.4 | 36950. | 27.424 |
| 25 | 725.00 | -1347.4 | 36950. | 27.424 |
| 872 | 725.00 | -1345.6 | 36950. | 27.461 |
| 26 | 725.00 | -1345.6 | 36950. | 27.461 |
| 873 | 725.00 | -1332.7 | 36950. | 27.725 |
| 27 | 725.00 | -1332.7 | 36950. | 27.725 |
| 948 | 725.00 | -1021.3 | 36950. | 36.181 |
| 162 | 725.00 | -1021.3 | 36950. | 36.181 |
| 947 | 725.00 | -1019.4 | 36950. | 36.246 |
| 161 | 725.00 | -1019.4 | 36950. | 36.246 |
| 946 | 725.00 | -1006.6 | 36950. | 36.707 |
| 160 | 725.00 | -1006.6 | 36950. | 36.707 |
| 159 | 725.00 | -1004.8 | 36950. | 36.774 |
| 945 | 725.00 | -1004.8 | 36950. | 36.774 |
| 944 | 725.00 | -1003.0 | 36950. | 36.841 |
| 158 | 725.00 | -1003.0 | 36950. | 36.841 |
| 943 | 725.00 | -982.95 | 36950. | 37.591 |
| 157 | 725.00 | -982.95 | 36950. | 37.591 |
| 942 | 725.00 | -962.95 | 36950. | 38.372 |
| 156 | 725.00 | -962.95 | 36950. | 38.372 |
| 432 | 725.00 | -950.47 | 36950. | 38.876 |
| 570 | 725.00 | -950.47 | 36950. | 38.876 |
| 941 | 725.00 | -942.94 | 36950. | 39.186 |
| 155 | 725.00 | -942.94 | 36950. | 39.186 |
| 431 | 725.00 | -930.34 | 36950. | 39.717 |
| 569 | 725.00 | -930.34 | 36950. | 39.717 |
| 940 | 725.00 | -922.93 | 36950. | 40.035 |
| 154 | 725.00 | -922.93 | 36950. | 40.035 |
| 430 | 725.00 | -910.21 | 36950. | 40.595 |
| 568 | 725.00 | -910.21 | 36950. | 40.595 |
| 282 | 725.00 | -910.05 | 36950. | 40.602 |
| 1008 | 725.00 | -910.05 | 36950. | 40.602 |
| 429 | 725.00 | -890.08 | 36950. | 41.513 |
| 567 | 725.00 | -890.08 | 36950. | 41.513 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1007 | 725.00 | -889.92 | 36950. | 41.521 |
| 281 | 725.00 | -889.92 | 36950. | 41.521 |
| 428 | 725.00 | -869.95 | 36950. | 42.474 |
| 566 | 725.00 | -869.95 | 36950. | 42.474 |
| 1006 | 725.00 | -869.79 | 36950. | 42.482 |
| 280 | 725.00 | -869.79 | 36950. | 42.482 |
| 795 | 725.00 | -856.20 | 36950. | 43.156 |
| 777 | 725.00 | -856.20 | 36950. | 43.156 |
| 794 | 725.00 | -854.38 | 36950. | 43.248 |
| 776 | 725.00 | -854.38 | 36950. | 43.248 |
| 427 | 725.00 | -849.82 | 36950. | 43.480 |
| 565 | 725.00 | -849.82 | 36950. | 43.480 |
| 1005 | 725.00 | -849.66 | 36950. | 43.488 |
| 279 | 725.00 | -849.66 | 36950. | 43.488 |
| 793 | 725.00 | -844.32 | 36950. | 43.763 |
| 775 | 725.00 | -844.32 | 36950. | 43.763 |
| 1004 | 725.00 | -829.53 | 36950. | 44.543 |
| 278 | 725.00 | -829.53 | 36950. | 44.543 |
| 1162 | 725.00 | -822.73 | 36950. | 44.911 |
| 1198 | 725.00 | -822.73 | 36950. | 44.911 |
| 138 | 725.00 | -822.16 | 36950. | 44.942 |
| 1152 | 725.00 | -822.16 | 36950. | 44.942 |
| 1163 | 725.00 | -820.90 | 36950. | 45.011 |
| 1199 | 725.00 | -820.90 | 36950. | 45.011 |
| 277 | 725.00 | -809.40 | 36950. | 45.651 |
| 1003 | 725.00 | -809.40 | 36950. | 45.651 |
| 1164 | 725.00 | -808.08 | 36950. | 45.726 |
| 1200 | 725.00 | -808.08 | 36950. | 45.726 |
| 1065 | 725.00 | -805.58 | 36950. | 45.868 |
| 219 | 725.00 | -805.58 | 36950. | 45.868 |
| 738 | 725.00 | -804.11 | 36950. | 45.951 |
| 660 | 725.00 | -804.11 | 36950. | 45.951 |
| 218 | 725.00 | -803.75 | 36950. | 45.972 |
| 1064 | 725.00 | -803.75 | 36950. | 45.972 |
| 737 | 725.00 | -802.28 | 36950. | 46.056 |
| 659 | 725.00 | -802.28 | 36950. | 46.056 |
| 1063 | 725.00 | -793.70 | 36950. | 46.554 |
| 217 | 725.00 | -793.70 | 36950. | 46.554 |
| 658 | 725.00 | -789.46 | 36950. | 46.804 |
| 736 | 725.00 | -789.46 | 36950. | 46.804 |
| 735 | 725.00 | -787.63 | 36950. | 46.913 |
| 657 | 725.00 | -787.63 | 36950. | 46.913 |
| 734 | 725.00 | -785.81 | 36950. | 47.022 |
| 656 | 725.00 | -785.81 | 36950. | 47.022 |
| 733 | 725.00 | -765.80 | 36950. | 48.250 |
| 655 | 725.00 | -765.80 | 36950. | 48.250 |
| 805 | 725.00 | 760.33 | 36950. | 48.597 |
| 811 | 725.00 | 760.33 | 36950. | 48.597 |
| 812 | 725.00 | 758.08 | 36950. | 48.741 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 806 | 725.00 | 758.08 | 36950. | 48.741 |
| 732 | 725.00 | -745.79 | 36950. | 49.545 |
| 654 | 725.00 | -745.79 | 36950. | 49.545 |
| 85 | 725.00 | 744.33 | 36950. | 49.642 |
| 1051 | 725.00 | 744.33 | 36950. | 49.642 |
| 86 | 725.00 | 742.09 | 36950. | 49.792 |
| 1052 | 725.00 | 742.09 | 36950. | 49.792 |
| 91 | 725.00 | 738.75 | 36950. | 50.017 |
| 1045 | 725.00 | 738.75 | 36950. | 50.017 |
| 813 | 725.00 | 737.95 | 36950. | 50.071 |
| 807 | 725.00 | 737.95 | 36950. | 50.071 |
| 1174 | 725.00 | -736.64 | 36950. | 50.161 |
| 1186 | 725.00 | -736.64 | 36950. | 50.161 |
| 92 | 725.00 | 736.50 | 36950. | 50.170 |
| 1046 | 725.00 | 736.50 | 36950. | 50.170 |
| 1175 | 725.00 | -734.81 | 36950. | 50.285 |
| 1187 | 725.00 | -734.81 | 36950. | 50.285 |
| 731 | 725.00 | -725.79 | 36950. | 50.910 |
| 653 | 725.00 | -725.79 | 36950. | 50.910 |
| 331 | 725.00 | 722.81 | 36950. | 51.120 |
| 325 | 725.00 | 722.81 | 36950. | 51.120 |
| 1176 | 725.00 | -721.99 | 36950. | 51.178 |
| 1188 | 725.00 | -721.99 | 36950. | 51.178 |
| 87 | 725.00 | 721.96 | 36950. | 51.180 |
| 1053 | 725.00 | 721.96 | 36950. | 51.180 |
| 326 | 725.00 | 720.56 | 36950. | 51.280 |
| 332 | 725.00 | 720.56 | 36950. | 51.280 |
| 808 | 725.00 | 717.82 | 36950. | 51.475 |
| 814 | 725.00 | 717.82 | 36950. | 51.475 |
| 1047 | 725.00 | 716.37 | 36950. | 51.579 |
| 93 | 725.00 | 716.37 | 36950. | 51.579 |
| 730 | 725.00 | -705.78 | 36950. | 52.353 |
| 652 | 725.00 | -705.78 | 36950. | 52.353 |
| 1054 | 725.00 | 701.83 | 36950. | 52.648 |
| 88 | 725.00 | 701.83 | 36950. | 52.648 |
| 327 | 725.00 | 700.43 | 36950. | 52.753 |
| 333 | 725.00 | 700.43 | 36950. | 52.753 |
| 809 | 725.00 | 697.69 | 36950. | 52.960 |
| 815 | 725.00 | 697.69 | 36950. | 52.960 |
| 1048 | 725.00 | 696.24 | 36950. | 53.071 |
| 94 | 725.00 | 696.24 | 36950. | 53.071 |
| 1055 | 725.00 | 681.70 | 36950. | 54.203 |
| 89 | 725.00 | 681.70 | 36950. | 54.203 |
| 334 | 725.00 | 680.30 | 36950. | 54.314 |
| 328 | 725.00 | 680.30 | 36950. | 54.314 |
| 816 | 725.00 | 677.57 | 36950. | 54.533 |
| 810 | 725.00 | 677.57 | 36950. | 54.533 |
| 95 | 725.00 | 676.11 | 36950. | 54.651 |
| 1049 | 725.00 | 676.11 | 36950. | 54.651 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 90 | 725.00 | 661.57 | 36950. | 55.852 |
| 1056 | 725.00 | 661.57 | 36950. | 55.852 |
| 329 | 725.00 | 660.17 | 36950. | 55.970 |
| 335 | 725.00 | 660.17 | 36950. | 55.970 |
| 96 | 725.00 | 655.98 | 36950. | 56.328 |
| 1050 | 725.00 | 655.98 | 36950. | 56.328 |
| 336 | 725.00 | 640.05 | 36950. | 57.730 |
| 330 | 725.00 | 640.05 | 36950. | 57.730 |
| 235 | 725.00 | 572.30 | 36950. | 64.565 |
| 1093 | 725.00 | 572.30 | 36950. | 64.565 |
| 1094 | 725.00 | 570.05 | 36950. | 64.819 |
| 236 | 725.00 | 570.05 | 36950. | 64.819 |
| 907 | 725.00 | 562.77 | 36950. | 65.657 |
| 37 | 725.00 | 562.77 | 36950. | 65.657 |
| 908 | 725.00 | 560.52 | 36950. | 65.920 |
| 38 | 725.00 | 560.52 | 36950. | 65.920 |
| 379 | 725.00 | 553.68 | 36950. | 66.735 |
| 469 | 725.00 | 553.68 | 36950. | 66.735 |
| 470 | 725.00 | 551.44 | 36950. | 67.007 |
| 380 | 725.00 | 551.44 | 36950. | 67.007 |
| 1095 | 725.00 | 549.92 | 36950. | 67.192 |
| 237 | 725.00 | 549.92 | 36950. | 67.192 |
| 661 | 725.00 | 541.00 | 36950. | 68.300 |
| 763 | 725.00 | 541.00 | 36950. | 68.300 |
| 39 | 725.00 | 540.40 | 36950. | 68.376 |
| 909 | 725.00 | 540.40 | 36950. | 68.376 |
| 662 | 725.00 | 538.75 | 36950. | 68.585 |
| 764 | 725.00 | 538.75 | 36950. | 68.585 |
| 381 | 725.00 | 531.31 | 36950. | 69.545 |
| 471 | 725.00 | 531.31 | 36950. | 69.545 |
| 1096 | 725.00 | 529.79 | 36950. | 69.744 |
| 238 | 725.00 | 529.79 | 36950. | 69.744 |
| 910 | 725.00 | 520.27 | 36950. | 71.021 |
| 40 | 725.00 | 520.27 | 36950. | 71.021 |
| 765 | 725.00 | 518.62 | 36950. | 71.246 |
| 663 | 725.00 | 518.62 | 36950. | 71.246 |
| 472 | 725.00 | 511.18 | 36950. | 72.284 |
| 382 | 725.00 | 511.18 | 36950. | 72.284 |
| 239 | 725.00 | 509.66 | 36950. | 72.499 |
| 1097 | 725.00 | 509.66 | 36950. | 72.499 |
| 911 | 725.00 | 500.14 | 36950. | 73.880 |
| 41 | 725.00 | 500.14 | 36950. | 73.880 |
| 664 | 725.00 | 498.49 | 36950. | 74.123 |
| 766 | 725.00 | 498.49 | 36950. | 74.123 |
| 383 | 725.00 | 491.05 | 36950. | 75.247 |
| 473 | 725.00 | 491.05 | 36950. | 75.247 |
| 1098 | 725.00 | 489.53 | 36950. | 75.480 |
| 240 | 725.00 | 489.53 | 36950. | 75.480 |
| 42 | 725.00 | 480.01 | 36950. | 76.978 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 912 | 725.00 | 480.01 | 36950. | 76.978 |
| 665 | 725.00 | 478.36 | 36950. | 77.242 |
| 767 | 725.00 | 478.36 | 36950. | 77.242 |
| 474 | 725.00 | 470.92 | 36950. | 78.463 |
| 384 | 725.00 | 470.92 | 36950. | 78.463 |
| 1210 | 725.00 | -467.12 | 36950. | 79.101 |
| 1235 | 725.00 | -467.12 | 36950. | 79.101 |
| 835 | 725.00 | -466.29 | 36950. | 79.243 |
| 673 | 725.00 | -466.29 | 36950. | 79.243 |
| 836 | 725.00 | -464.04 | 36950. | 79.627 |
| 674 | 725.00 | -464.04 | 36950. | 79.627 |
| 666 | 725.00 | 458.24 | 36950. | 80.635 |
| 768 | 725.00 | 458.24 | 36950. | 80.635 |
| 1209 | 725.00 | -444.09 | 36950. | 83.204 |
| 1234 | 725.00 | -444.09 | 36950. | 83.204 |
| 837 | 725.00 | -439.44 | 36950. | 84.084 |
| 675 | 725.00 | -439.44 | 36950. | 84.084 |
| 1208 | 725.00 | -421.06 | 36950. | 87.755 |
| 1233 | 725.00 | -421.06 | 36950. | 87.755 |
| 838 | 725.00 | -414.84 | 36950. | 89.070 |
| 676 | 725.00 | -414.84 | 36950. | 89.070 |
| 1207 | 725.00 | -398.03 | 36950. | 92.833 |
| 1232 | 725.00 | -398.03 | 36950. | 92.833 |
| 839 | 725.00 | -390.24 | 36950. | 94.685 |
| 677 | 725.00 | -390.24 | 36950. | 94.685 |
| 133 | 725.00 | -374.99 | 36950. | 98.535 |
| 1147 | 725.00 | -374.99 | 36950. | 98.535 |
| 840 | 725.00 | -365.64 | 36950. | 101.06 |
| 678 | 725.00 | -365.64 | 36950. | 101.06 |
| 792 | 725.00 | -337.29 | 36950. | 109.55 |
| 774 | 725.00 | -337.29 | 36950. | 109.55 |
| 791 | 725.00 | -335.04 | 36950. | 110.29 |
| 773 | 725.00 | -335.04 | 36950. | 110.29 |
| 790 | 725.00 | -307.04 | 36950. | 120.34 |
| 772 | 725.00 | -307.04 | 36950. | 120.34 |
| 789 | 725.00 | -282.44 | 36950. | 130.83 |
| 771 | 725.00 | -282.44 | 36950. | 130.83 |
| 788 | 725.00 | -257.84 | 36950. | 143.31 |
| 770 | 725.00 | -257.84 | 36950. | 143.31 |
| 787 | 725.00 | -233.24 | 36950. | 158.42 |
| 769 | 725.00 | -233.24 | 36950. | 158.42 |
| 690 | 725.00 | -228.12 | 36950. | 161.97 |
| 852 | 725.00 | -228.12 | 36950. | 161.97 |
| 851 | 725.00 | -226.30 | 36950. | 163.28 |
| 689 | 725.00 | -226.30 | 36950. | 163.28 |
| 523 | 725.00 | -219.49 | 36950. | 168.34 |
| 517 | 725.00 | -219.49 | 36950. | 168.34 |
| 853 | 725.00 | -218.45 | 36950. | 169.14 |
| 715 | 725.00 | -218.45 | 36950. | 169.14 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 524 | 725.00 | -217.24 | 36950. | 170.09 |
| 518 | 725.00 | -217.24 | 36950. | 170.09 |
| 854 | 725.00 | -216.21 | 36950. | 170.90 |
| 716 | 725.00 | -216.21 | 36950. | 170.90 |
| 850 | 725.00 | -213.47 | 36950. | 173.09 |
| 688 | 725.00 | -213.47 | 36950. | 173.09 |
| 849 | 725.00 | -211.65 | 36950. | 174.58 |
| 687 | 725.00 | -211.65 | 36950. | 174.58 |
| 139 | 725.00 | -209.97 | 36950. | 175.98 |
| 1141 | 725.00 | -209.97 | 36950. | 175.98 |
| 686 | 725.00 | -209.82 | 36950. | 176.10 |
| 848 | 725.00 | -209.82 | 36950. | 176.10 |
| 140 | 725.00 | -207.73 | 36950. | 177.88 |
| 1142 | 725.00 | -207.73 | 36950. | 177.88 |
| 181 | 725.00 | -207.14 | 36950. | 178.38 |
| 955 | 725.00 | -207.14 | 36950. | 178.38 |
| 949 | 725.00 | -205.11 | 36950. | 180.15 |
| 187 | 725.00 | -205.11 | 36950. | 180.15 |
| 956 | 725.00 | -204.90 | 36950. | 180.34 |
| 182 | 725.00 | -204.90 | 36950. | 180.34 |
| 950 | 725.00 | -202.86 | 36950. | 182.14 |
| 188 | 725.00 | -202.86 | 36950. | 182.14 |
| 525 | 725.00 | -197.11 | 36950. | 187.45 |
| 519 | 725.00 | -197.11 | 36950. | 187.45 |
| 717 | 725.00 | -196.08 | 36950. | 188.45 |
| 855 | 725.00 | -196.08 | 36950. | 188.45 |
| 276 | 725.00 | -191.55 | 36950. | 192.90 |
| 978 | 725.00 | -191.55 | 36950. | 192.90 |
| 685 | 725.00 | -189.81 | 36950. | 194.66 |
| 847 | 725.00 | -189.81 | 36950. | 194.66 |
| 275 | 725.00 | -189.73 | 36950. | 194.75 |
| 977 | 725.00 | -189.73 | 36950. | 194.75 |
| 141 | 725.00 | -187.60 | 36950. | 196.96 |
| 1143 | 725.00 | -187.60 | 36950. | 196.96 |
| 183 | 725.00 | -184.77 | 36950. | 199.98 |
| 957 | 725.00 | -184.77 | 36950. | 199.98 |
| 619 | 725.00 | -183.11 | 36950. | 201.80 |
| 613 | 725.00 | -183.11 | 36950. | 201.80 |
| 189 | 725.00 | -182.73 | 36950. | 202.21 |
| 951 | 725.00 | -182.73 | 36950. | 202.21 |
| 264 | 725.00 | 182.66 | 36950. | 202.29 |
| 966 | 725.00 | 182.66 | 36950. | 202.29 |
| 620 | 725.00 | -180.86 | 36950. | 204.30 |
| 614 | 725.00 | -180.86 | 36950. | 204.30 |
| 263 | 725.00 | 180.41 | 36950. | 204.81 |
| 965 | 725.00 | 180.41 | 36950. | 204.81 |
| 520 | 725.00 | -176.99 | 36950. | 208.77 |
| 526 | 725.00 | -176.99 | 36950. | 208.77 |
| 274 | 725.00 | -176.90 | 36950. | 208.87 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 976 | 725.00 | -176.90 | 36950. | 208.87 |
| 718 | 725.00 | -175.95 | 36950. | 210.00 |
| 856 | 725.00 | -175.95 | 36950. | 210.00 |
| 975 | 725.00 | -175.08 | 36950. | 211.05 |
| 273 | 725.00 | -175.08 | 36950. | 211.05 |
| 272 | 725.00 | -173.25 | 36950. | 213.28 |
| 974 | 725.00 | -173.25 | 36950. | 213.28 |
| 684 | 725.00 | -169.81 | 36950. | 217.60 |
| 846 | 725.00 | -169.81 | 36950. | 217.60 |
| 142 | 725.00 | -167.47 | 36950. | 220.64 |
| 1144 | 725.00 | -167.47 | 36950. | 220.64 |
| 958 | 725.00 | -164.64 | 36950. | 224.43 |
| 184 | 725.00 | -164.64 | 36950. | 224.43 |
| 190 | 725.00 | -162.60 | 36950. | 227.24 |
| 952 | 725.00 | -162.60 | 36950. | 227.24 |
| 615 | 725.00 | -160.73 | 36950. | 229.89 |
| 621 | 725.00 | -160.73 | 36950. | 229.89 |
| 527 | 725.00 | -156.86 | 36950. | 235.57 |
| 521 | 725.00 | -156.86 | 36950. | 235.57 |
| 719 | 725.00 | -155.82 | 36950. | 237.13 |
| 857 | 725.00 | -155.82 | 36950. | 237.13 |
| 262 | 725.00 | 155.81 | 36950. | 237.15 |
| 964 | 725.00 | 155.81 | 36950. | 237.15 |
| 271 | 725.00 | -153.24 | 36950. | 241.12 |
| 973 | 725.00 | -153.24 | 36950. | 241.12 |
| 143 | 725.00 | -147.34 | 36950. | 250.78 |
| 1145 | 725.00 | -147.34 | 36950. | 250.78 |
| 185 | 725.00 | -144.51 | 36950. | 255.69 |
| 959 | 725.00 | -144.51 | 36950. | 255.69 |
| 953 | 725.00 | -142.48 | 36950. | 259.34 |
| 191 | 725.00 | -142.48 | 36950. | 259.34 |
| 616 | 725.00 | -140.60 | 36950. | 262.80 |
| 622 | 725.00 | -140.60 | 36950. | 262.80 |
| 528 | 725.00 | -136.73 | 36950. | 270.24 |
| 522 | 725.00 | -136.73 | 36950. | 270.24 |
| 858 | 725.00 | -135.69 | 36950. | 272.31 |
| 720 | 725.00 | -135.69 | 36950. | 272.31 |
| 270 | 725.00 | -133.24 | 36950. | 277.33 |
| 972 | 725.00 | -133.24 | 36950. | 277.33 |
| 963 | 725.00 | 131.21 | 36950. | 281.61 |
| 261 | 725.00 | 131.21 | 36950. | 281.61 |
| 144 | 725.00 | -127.21 | 36950. | 290.46 |
| 1146 | 725.00 | -127.21 | 36950. | 290.46 |
| 186 | 725.00 | -124.38 | 36950. | 297.07 |
| 960 | 725.00 | -124.38 | 36950. | 297.07 |
| 192 | 725.00 | -122.35 | 36950. | 302.01 |
| 954 | 725.00 | -122.35 | 36950. | 302.01 |
| 617 | 725.00 | -120.47 | 36950. | 306.71 |
| 623 | 725.00 | -120.47 | 36950. | 306.71 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 260 | 725.00 | 106.61 | 36950. | 346.58 |
| 962 | 725.00 | 106.61 | 36950. | 346.58 |
| 624 | 725.00 | -100.34 | 36950. | 368.24 |
| 618 | 725.00 | -100.34 | 36950. | 368.24 |
| 216 | 725.00 | -98.631 | 36950. | 374.63 |
| 1062 | 725.00 | -98.631 | 36950. | 374.63 |
| 1061 | 725.00 | -96.384 | 36950. | 383.36 |
| 215 | 725.00 | -96.384 | 36950. | 383.36 |
| 1099 | 725.00 | -95.406 | 36950. | 387.29 |
| 229 | 725.00 | -95.406 | 36950. | 387.29 |
| 1230 | 725.00 | 93.505 | 36950. | 395.17 |
| 1215 | 725.00 | 93.505 | 36950. | 395.17 |
| 230 | 725.00 | -93.159 | 36950. | 396.63 |
| 1100 | 725.00 | -93.159 | 36950. | 396.63 |
| 901 | 725.00 | -91.236 | 36950. | 405.00 |
| 43 | 725.00 | -91.236 | 36950. | 405.00 |
| 757 | 725.00 | -89.084 | 36950. | 414.78 |
| 667 | 725.00 | -89.084 | 36950. | 414.78 |
| 44 | 725.00 | -88.989 | 36950. | 415.22 |
| 902 | 725.00 | -88.989 | 36950. | 415.22 |
| 668 | 725.00 | -86.837 | 36950. | 425.51 |
| 758 | 725.00 | -86.837 | 36950. | 425.51 |
| 1220 | 725.00 | 84.156 | 36950. | 439.07 |
| 1225 | 725.00 | 84.156 | 36950. | 439.07 |
| 961 | 725.00 | 82.013 | 36950. | 450.54 |
| 259 | 725.00 | 82.013 | 36950. | 450.54 |
| 231 | 725.00 | -73.030 | 36950. | 505.95 |
| 1101 | 725.00 | -73.030 | 36950. | 505.95 |
| 475 | 725.00 | -71.347 | 36950. | 517.89 |
| 373 | 725.00 | -71.347 | 36950. | 517.89 |
| 1229 | 725.00 | 70.472 | 36950. | 524.32 |
| 1214 | 725.00 | 70.472 | 36950. | 524.32 |
| 476 | 725.00 | -69.100 | 36950. | 534.73 |
| 374 | 725.00 | -69.100 | 36950. | 534.73 |
| 1205 | 725.00 | -69.074 | 36950. | 534.93 |
| 1240 | 725.00 | -69.074 | 36950. | 534.93 |
| 903 | 725.00 | -68.860 | 36950. | 536.60 |
| 45 | 725.00 | -68.860 | 36950. | 536.60 |
| 214 | 725.00 | -68.379 | 36950. | 540.37 |
| 1060 | 725.00 | -68.379 | 36950. | 540.37 |
| 759 | 725.00 | -66.708 | 36950. | 553.90 |
| 669 | 725.00 | -66.708 | 36950. | 553.90 |
| 1211 | 725.00 | -61.481 | 36950. | 601.00 |
| 1226 | 725.00 | -61.481 | 36950. | 601.00 |
| 1219 | 725.00 | 61.124 | 36950. | 604.51 |
| 1224 | 725.00 | 61.124 | 36950. | 604.51 |
| 1206 | 725.00 | -59.538 | 36950. | 620.61 |
| 1231 | 725.00 | -59.538 | 36950. | 620.61 |
| 232 | 725.00 | -52.902 | 36950. | 698.47 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1102 | 725.00 | -52.902 | 36950. | 698.47 |
| 714 | 725.00 | -51.736 | 36950. | 714.20 |
| 864 | 725.00 | -51.736 | 36950. | 714.20 |
| 375 | 725.00 | -48.971 | 36950. | 754.52 |
| 477 | 725.00 | -48.971 | 36950. | 754.52 |
| 46 | 725.00 | -48.731 | 36950. | 758.25 |
| 904 | 725.00 | -48.731 | 36950. | 758.25 |
| 1228 | 725.00 | 47.440 | 36950. | 778.88 |
| 1213 | 725.00 | 47.440 | 36950. | 778.88 |
| 760 | 725.00 | -46.579 | 36950. | 793.27 |
| 670 | 725.00 | -46.579 | 36950. | 793.27 |
| 1204 | 725.00 | -46.042 | 36950. | 802.53 |
| 1239 | 725.00 | -46.042 | 36950. | 802.53 |
| 213 | 725.00 | -43.780 | 36950. | 844.00 |
| 1059 | 725.00 | -43.780 | 36950. | 844.00 |
| 576 | 725.00 | 41.767 | 36950. | 884.68 |
| 426 | 725.00 | 41.767 | 36950. | 884.68 |
| 1223 | 725.00 | 38.091 | 36950. | 970.04 |
| 1218 | 725.00 | 38.091 | 36950. | 970.04 |
| 1103 | 725.00 | -32.773 | 36950. | 1127.5 |
| 233 | 725.00 | -32.773 | 36950. | 1127.5 |
| 480 | 725.00 | 32.544 | 36950. | 1135.4 |
| 378 | 725.00 | 32.544 | 36950. | 1135.4 |
| 376 | 725.00 | -28.843 | 36950. | 1281.1 |
| 478 | 725.00 | -28.843 | 36950. | 1281.1 |
| 47 | 725.00 | -28.602 | 36950. | 1291.9 |
| 905 | 725.00 | -28.602 | 36950. | 1291.9 |
| 761 | 725.00 | -26.450 | 36950. | 1397.0 |
| 671 | 725.00 | -26.450 | 36950. | 1397.0 |
| 571 | 725.00 | 26.302 | 36950. | 1404.8 |
| 421 | 725.00 | 26.302 | 36950. | 1404.8 |
| 1212 | 725.00 | 24.408 | 36950. | 1513.9 |
| 1227 | 725.00 | 24.408 | 36950. | 1513.9 |
| 1237 | 725.00 | 24.055 | 36950. | 1536.1 |
| 1202 | 725.00 | 24.055 | 36950. | 1536.1 |
| 1201 | 725.00 | -23.483 | 36950. | 1573.4 |
| 1236 | 725.00 | -23.483 | 36950. | 1573.4 |
| 1203 | 725.00 | 23.010 | 36950. | 1605.9 |
| 1238 | 725.00 | -23.010 | 36950. | 1605.9 |
| 212 | 725.00 | -19.180 | 36950. | 1926.5 |
| 1058 | 725.00 | 19.180 | 36950. | 1926.5 |
| 1216 | 725.00 | -17.161 | 36950. | 2153.1 |
| 1221 | 725.00 | -17.161 | 36950. | 2153.1 |
| 1217 | 725.00 | 15.059 | 36950. | 2453.7 |
| 1222 | 725.00 | -15.059 | 36950. | 2453.7 |
| 672 | 725.00 | 14.807 | 36950. | 2495.4 |
| 762 | 725.00 | -14.807 | 36950. | 2495.4 |
| 48 | 725.00 | -12.656 | 36950. | 2919.6 |
| 906 | 725.00 | 12.656 | 36950. | 2919.6 |

Table 5 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 234 | 725.00 | 12.644 | 36950. | 2922.4 |
| 1104 | 725.00 | -12.644 | 36950. | 2922.4 |
| 377 | 725.00 | -12.415 | 36950. | 2976.2 |
| 479 | 725.00 | 12.415 | 36950. | 2976.2 |
| 709 | 725.00 | -11.220 | 36950. | 3293.1 |
| 859 | 725.00 | -11.220 | 36950. | 3293.1 |
| 211 | 725.00 | 8.6661 | 36950. | 4263.7 |
| 1057 | 725.00 | 8.6661 | 36950. | 4263.7 |
| 288 | 725.00 | -5.8168 | 36950. | 6352.3 |
| 1002 | 725.00 | 5.8168 | 36950. | 6352.3 |
| 283 | 725.00 | -1.8716 | 36950. | 19743. |
| 997 | 725.00 | 1.8716 | 36950. | 19743. |

Table 6

TITLE=
MPC-24E Structural Analysis

SUBTITLE 1 =
Component: Fuel Basket
SUBTITLE 2 =
Load Combination: F2.b (See Table 2.1.6)
SUBTITLE 3 =
Stress Result: Primary Local Plus Primary Bending (PL+PB)

PRINT ELEMENT TABLE ITEMS PER ELEMENT

| STAT ELEM | CURRENT REF TEMP | CURRENT PL+PB | PREVIOUS ALLOW | PREVIOUS SF |
|---|---|---|---|---|
| 75 | 725.00 | 30436. | 55450. | 1.8218 |
| 1017 | 725.00 | 30436. | 55450. | 1.8218 |
| 499 | 725.00 | 29876. | 55450. | 1.8560 |
| 481 | 725.00 | 29876. | 55450. | 1.8560 |
| 577 | 725.00 | 29191. | 55450. | 1.8995 |
| 595 | 725.00 | 29191. | 55450. | 1.8995 |
| 892 | 725.00 | 28808. | 55450. | 1.9248 |
| 10 | 725.00 | 28808. | 55450. | 1.9248 |
| 74 | 725.00 | 27664. | 55450. | 2.0044 |
| 1016 | 725.00 | 27664. | 55450. | 2.0044 |
| 482 | 725.00 | 27240. | 55450. | 2.0356 |
| 500 | 725.00 | 27240. | 55450. | 2.0356 |
| 931 | 725.00 | 26624. | 55450. | 2.0827 |
| 145 | 725.00 | 26624. | 55450. | 2.0827 |
| 667 | 725.00 | 26526. | 55450. | 2.0904 |
| 757 | 725.00 | 26526. | 55450. | 2.0904 |
| 578 | 725.00 | 26510. | 55450. | 2.0917 |
| 596 | 725.00 | 26510. | 55450. | 2.0917 |
| 229 | 725.00 | 26463. | 55450. | 2.0954 |
| 1099 | 725.00 | 26463. | 55450. | 2.0954 |
| 893 | 725.00 | 26269. | 55450. | 2.1109 |
| 11 | 725.00 | 26269. | 55450. | 2.1109 |
| 373 | 725.00 | 25581. | 55450. | 2.1677 |
| 475 | 725.00 | 25581. | 55450. | 2.1677 |
| 18 | 725.00 | 25076. | 55450. | 2.2113 |
| 900 | 725.00 | 25076. | 55450. | 2.2113 |
| 433 | 725.00 | 24631. | 55450. | 2.2512 |
| 355 | 725.00 | 24631. | 55450. | 2.2512 |
| 882 | 725.00 | 24419. | 55450. | 2.2708 |
| 36 | 725.00 | 24419. | 55450. | 2.2708 |
| 932 | 725.00 | 24044. | 55450. | 2.3062 |
| 146 | 725.00 | 24044. | 55450. | 2.3062 |
| 668 | 725.00 | 23971. | 55450. | 2.3132 |
| 758 | 725.00 | 23971. | 55450. | 2.3132 |
| 230 | 725.00 | 23873. | 55450. | 2.3227 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1100 | 725.00 | 23873. | 55450. | 2.3227 |
| 1156 | 725.00 | 23563. | 55450. | 2.3533 |
| 1192 | 725.00 | 23563. | 55450. | 2.3533 |
| 901 | 725.00 | 23509. | 55450. | 2.3587 |
| 43 | 725.00 | 23509. | 55450. | 2.3587 |
| 102 | 725.00 | 23424. | 55450. | 2.3672 |
| 1128 | 725.00 | 23424. | 55450. | 2.3672 |
| 283 | 725.00 | 23190. | 55450. | 2.3911 |
| 997 | 725.00 | 23190. | 55450. | 2.3911 |
| 374 | 725.00 | 23074. | 55450. | 2.4032 |
| 476 | 725.00 | 23074. | 55450. | 2.4032 |
| 634 | 725.00 | 23002. | 55450. | 2.4106 |
| 748 | 725.00 | 23002. | 55450. | 2.4106 |
| 642 | 725.00 | 22800. | 55450. | 2.4321 |
| 756 | 725.00 | 22800. | 55450. | 2.4321 |
| 17 | 725.00 | 22554. | 55450. | 2.4585 |
| 899 | 725.00 | 22554. | 55450. | 2.4585 |
| 434 | 725.00 | 22376. | 55450. | 2.4780 |
| 356 | 725.00 | 22376. | 55450. | 2.4780 |
| 810 | 725.00 | 22123. | 55450. | 2.5065 |
| 816 | 725.00 | 22123. | 55450. | 2.5065 |
| 1083 | 725.00 | 21923. | 55450. | 2.5293 |
| 201 | 725.00 | 21923. | 55450. | 2.5293 |
| 881 | 725.00 | 21716. | 55450. | 2.5534 |
| 35 | 725.00 | 21716. | 55450. | 2.5534 |
| 1157 | 725.00 | 21596. | 55450. | 2.5676 |
| 1193 | 725.00 | 21596. | 55450. | 2.5676 |
| 297 | 725.00 | 21451. | 55450. | 2.5850 |
| 315 | 725.00 | 21451. | 55450. | 2.5850 |
| 1182 | 725.00 | 21304. | 55450. | 2.6028 |
| 1170 | 725.00 | 21304. | 55450. | 2.6028 |
| 101 | 725.00 | 21202. | 55450. | 2.6153 |
| 1127 | 725.00 | 21202. | 55450. | 2.6153 |
| 673 | 725.00 | 21196. | 55450. | 2.6161 |
| 835 | 725.00 | 21196. | 55450. | 2.6161 |
| 90 | 725.00 | 21126. | 55450. | 2.6247 |
| 1056 | 725.00 | 21126. | 55450. | 2.6247 |
| 96 | 725.00 | 21121. | 55450. | 2.6254 |
| 1050 | 725.00 | 21121. | 55450. | 2.6254 |
| 902 | 725.00 | 21036. | 55450. | 2.6359 |
| 44 | 725.00 | 21036. | 55450. | 2.6359 |
| 641 | 725.00 | 20868. | 55450. | 2.6571 |
| 755 | 725.00 | 20868. | 55450. | 2.6571 |
| 1227 | 725.00 | 20787. | 55450. | 2.6675 |
| 1212 | 725.00 | 20787. | 55450. | 2.6675 |
| 1062 | 725.00 | 20721. | 55450. | 2.6760 |
| 216 | 725.00 | 20721. | 55450. | 2.6760 |
| 635 | 725.00 | 20618. | 55450. | 2.6894 |
| 749 | 725.00 | 20618. | 55450. | 2.6894 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 777 | 725.00 | 20456. | 55450. | 2.7107 |
| 795 | 725.00 | 20456. | 55450. | 2.7107 |
| 361 | 725.00 | 20369. | 55450. | 2.7222 |
| 439 | 725.00 | 20369. | 55450. | 2.7222 |
| 153 | 725.00 | 20183. | 55450. | 2.7474 |
| 939 | 725.00 | 20183. | 55450. | 2.7474 |
| 1181 | 725.00 | 19896. | 55450. | 2.7869 |
| 1169 | 725.00 | 19896. | 55450. | 2.7869 |
| 489 | 725.00 | 19887. | 55450. | 2.7883 |
| 507 | 725.00 | 19887. | 55450. | 2.7883 |
| 9 | 725.00 | 19649. | 55450. | 2.8220 |
| 891 | 725.00 | 19649. | 55450. | 2.8220 |
| 586 | 725.00 | 19555. | 55450. | 2.8355 |
| 604 | 725.00 | 19555. | 55450. | 2.8355 |
| 1141 | 725.00 | 19553. | 55450. | 2.8360 |
| 139 | 725.00 | 19553. | 55450. | 2.8360 |
| 888 | 725.00 | 19389. | 55450. | 2.8598 |
| 6 | 725.00 | 19389. | 55450. | 2.8598 |
| 1082 | 725.00 | 19273. | 55450. | 2.8771 |
| 200 | 725.00 | 19273. | 55450. | 2.8771 |
| 330 | 725.00 | 19181. | 55450. | 2.8909 |
| 336 | 725.00 | 19181. | 55450. | 2.8909 |
| 922 | 725.00 | 19017. | 55450. | 2.9158 |
| 172 | 725.00 | 19017. | 55450. | 2.9158 |
| 296 | 725.00 | 18939. | 55450. | 2.9278 |
| 314 | 725.00 | 18939. | 55450. | 2.9278 |
| 836 | 725.00 | 18886. | 55450. | 2.9360 |
| 674 | 725.00 | 18886. | 55450. | 2.9360 |
| 603 | 725.00 | 18472. | 55450. | 3.0019 |
| 585 | 725.00 | 18472. | 55450. | 3.0019 |
| 1061 | 725.00 | 18276. | 55450. | 3.0340 |
| 215 | 725.00 | 18276. | 55450. | 3.0340 |
| 362 | 725.00 | 18140. | 55450. | 3.0568 |
| 440 | 725.00 | 18140. | 55450. | 3.0568 |
| 152 | 725.00 | 17711. | 55450. | 3.1308 |
| 938 | 725.00 | 17711. | 55450. | 3.1308 |
| 794 | 725.00 | 17672. | 55450. | 3.1378 |
| 776 | 725.00 | 17672. | 55450. | 3.1378 |
| 587 | 725.00 | 17392. | 55450. | 3.1882 |
| 605 | 725.00 | 17392. | 55450. | 3.1882 |
| 883 | 725.00 | 17336. | 55450. | 3.1985 |
| 1 | 725.00 | 17336. | 55450. | 3.1985 |
| 488 | 725.00 | 17285. | 55450. | 3.2080 |
| 506 | 725.00 | 17285. | 55450. | 3.2080 |
| 887 | 725.00 | 17261. | 55450. | 3.2125 |
| 5 | 725.00 | 17261. | 55450. | 3.2125 |
| 1142 | 725.00 | 17246. | 55450. | 3.2152 |
| 140 | 725.00 | 17246. | 55450. | 3.2152 |
| 1123 | 725.00 | 17106. | 55450. | 3.2415 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 97 | 725.00 | 17106. | 55450. | 3.2415 |
| 8 | 725.00 | 17069. | 55450. | 3.2486 |
| 890 | 725.00 | 17069. | 55450. | 3.2486 |
| 468 | 725.00 | 17055. | 55450. | 3.2513 |
| 354 | 725.00 | 17055. | 55450. | 3.2513 |
| 923 | 725.00 | 16855. | 55450. | 3.2899 |
| 173 | 725.00 | 16855. | 55450. | 3.2899 |
| 432 | 725.00 | 16854. | 55450. | 3.2900 |
| 570 | 725.00 | 16854. | 55450. | 3.2900 |
| 360 | 725.00 | 16786. | 55450. | 3.3033 |
| 438 | 725.00 | 16786. | 55450. | 3.3033 |
| 467 | 725.00 | 16744. | 55450. | 3.3117 |
| 353 | 725.00 | 16744. | 55450. | 3.3117 |
| 1065 | 725.00 | 16646. | 55450. | 3.3312 |
| 219 | 725.00 | 16646. | 55450. | 3.3312 |
| 304 | 725.00 | 16580. | 55450. | 3.3443 |
| 322 | 725.00 | 16580. | 55450. | 3.3443 |
| 610 | 725.00 | 16224. | 55450. | 3.4179 |
| 592 | 725.00 | 16224. | 55450. | 3.4179 |
| 602 | 725.00 | 16184. | 55450. | 3.4261 |
| 584 | 725.00 | 16184. | 55450. | 3.4261 |
| 27 | 725.00 | 16025. | 55450. | 3.4602 |
| 873 | 725.00 | 16025. | 55450. | 3.4602 |
| 426 | 725.00 | 15937. | 55450. | 3.4793 |
| 576 | 725.00 | 15937. | 55450. | 3.4793 |
| 609 | 725.00 | 15904. | 55450. | 3.4865 |
| 591 | 725.00 | 15904. | 55450. | 3.4865 |
| 927 | 725.00 | 15414. | 55450. | 3.5973 |
| 177 | 725.00 | 15414. | 55450. | 3.5973 |
| 502 | 725.00 | 15313. | 55450. | 3.6211 |
| 503 | 725.00 | 15313. | 55450. | 3.6211 |
| 484 | 725.00 | 15313. | 55450. | 3.6211 |
| 485 | 725.00 | 15313. | 55450. | 3.6211 |
| 884 | 725.00 | 15297. | 55450. | 3.6248 |
| 2 | 725.00 | 15297. | 55450. | 3.6248 |
| 13 | 725.00 | 15266. | 55450. | 3.6323 |
| 12 | 725.00 | 15266. | 55450. | 3.6323 |
| 895 | 725.00 | 15266. | 55450. | 3.6323 |
| 894 | 725.00 | 15266. | 55450. | 3.6323 |
| 402 | 725.00 | 15230. | 55450. | 3.6409 |
| 564 | 725.00 | 15230. | 55450. | 3.6409 |
| 1124 | 725.00 | 15160. | 55450. | 3.6576 |
| 98 | 725.00 | 15160. | 55450. | 3.6576 |
| 312 | 725.00 | 15032. | 55450. | 3.6889 |
| 294 | 725.00 | 15032. | 55450. | 3.6889 |
| 501 | 725.00 | 14890. | 55450. | 3.7241 |
| 483 | 725.00 | 14890. | 55450. | 3.7241 |
| 359 | 725.00 | 14874. | 55450. | 3.7280 |
| 437 | 725.00 | 14874. | 55450. | 3.7280 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 401 | 725.00 | 14854. | 55450. | 3.7329 |
| 563 | 725.00 | 14854. | 55450. | 3.7329 |
| 427 | 725.00 | 14798. | 55450. | 3.7470 |
| 565 | 725.00 | 14798. | 55450. | 3.7470 |
| 352 | 725.00 | 14754. | 55450. | 3.7583 |
| 466 | 725.00 | 14754. | 55450. | 3.7583 |
| 311 | 725.00 | 14733. | 55450. | 3.7636 |
| 293 | 725.00 | 14733. | 55450. | 3.7636 |
| 896 | 725.00 | 14628. | 55450. | 3.7906 |
| 14 | 725.00 | 14628. | 55450. | 3.7906 |
| 358 | 725.00 | 14548. | 55450. | 3.8116 |
| 357 | 725.00 | 14548. | 55450. | 3.8116 |
| 435 | 725.00 | 14548. | 55450. | 3.8116 |
| 436 | 725.00 | 14548. | 55450. | 3.8116 |
| 305 | 725.00 | 14479. | 55450. | 3.8297 |
| 323 | 725.00 | 14479. | 55450. | 3.8297 |
| 1171 | 725.00 | 14252. | 55450. | 3.8907 |
| 1183 | 725.00 | 14252. | 55450. | 3.8907 |
| 608 | 725.00 | 13901. | 55450. | 3.9891 |
| 590 | 725.00 | 13901. | 55450. | 3.9891 |
| 611 | 725.00 | 13835. | 55450. | 4.0079 |
| 593 | 725.00 | 13835. | 55450. | 4.0079 |
| 1064 | 725.00 | 13744. | 55450. | 4.0346 |
| 218 | 725.00 | 13744. | 55450. | 4.0346 |
| 26 | 725.00 | 13710. | 55450. | 4.0446 |
| 872 | 725.00 | 13710. | 55450. | 4.0446 |
| 598 | 725.00 | 13633. | 55450. | 4.0673 |
| 599 | 725.00 | 13633. | 55450. | 4.0673 |
| 581 | 725.00 | 13633. | 55450. | 4.0673 |
| 580 | 725.00 | 13633. | 55450. | 4.0673 |
| 1014 | 725.00 | 13594. | 55450. | 4.0791 |
| 72 | 725.00 | 13594. | 55450. | 4.0791 |
| 1013 | 725.00 | 13474. | 55450. | 4.1154 |
| 71 | 725.00 | 13474. | 55450. | 4.1154 |
| 1240 | 725.00 | 13473. | 55450. | 4.1158 |
| 1205 | 725.00 | 13473. | 55450. | 4.1158 |
| 926 | 725.00 | 13409. | 55450. | 4.1351 |
| 176 | 725.00 | 13409. | 55450. | 4.1351 |
| 928 | 725.00 | 13315. | 55450. | 4.1646 |
| 178 | 725.00 | 13315. | 55450. | 4.1646 |
| 1162 | 725.00 | 13267. | 55450. | 4.1794 |
| 1198 | 725.00 | 13267. | 55450. | 4.1794 |
| 566 | 725.00 | 12760. | 55450. | 4.3457 |
| 428 | 725.00 | 12760. | 55450. | 4.3457 |
| 597 | 725.00 | 12709. | 55450. | 4.3629 |
| 579 | 725.00 | 12709. | 55450. | 4.3629 |
| 1172 | 725.00 | 12665. | 55450. | 4.3782 |
| 1184 | 725.00 | 12665. | 55450. | 4.3782 |
| 214 | 725.00 | 12462. | 55450. | 4.4495 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 213 | 725.00 | 12462. | 55450. | 4.4495 |
| 1060 | 725.00 | 12462. | 55450. | 4.4495 |
| 1059 | 725.00 | 12462. | 55450. | 4.4495 |
| 1188 | 725.00 | 12455. | 55450. | 4.4520 |
| 1176 | 725.00 | 12455. | 55450. | 4.4520 |
| 400 | 725.00 | 12414. | 55450. | 4.4667 |
| 562 | 725.00 | 12414. | 55450. | 4.4667 |
| 649 | 725.00 | 12371. | 55450. | 4.4824 |
| 727 | 725.00 | 12371. | 55450. | 4.4824 |
| 307 | 725.00 | 12369. | 55450. | 4.4831 |
| 289 | 725.00 | 12369. | 55450. | 4.4831 |
| 441 | 725.00 | 12333. | 55450. | 4.4962 |
| 363 | 725.00 | 12333. | 55450. | 4.4962 |
| 1165 | 725.00 | 12282. | 55450. | 4.5146 |
| 1177 | 725.00 | 12282. | 55450. | 4.5146 |
| 1125 | 725.00 | 12236. | 55450. | 4.5315 |
| 1126 | 725.00 | 12236. | 55450. | 4.5315 |
| 99 | 725.00 | 12236. | 55450. | 4.5315 |
| 100 | 725.00 | 12236. | 55450. | 4.5315 |
| 808 | 725.00 | 12204. | 55450. | 4.5435 |
| 807 | 725.00 | 12204. | 55450. | 4.5435 |
| 813 | 725.00 | 12204. | 55450. | 4.5435 |
| 814 | 725.00 | 12204. | 55450. | 4.5435 |
| 933 | 725.00 | 12174. | 55450. | 4.5548 |
| 934 | 725.00 | 12174. | 55450. | 4.5548 |
| 147 | 725.00 | 12174. | 55450. | 4.5548 |
| 148 | 725.00 | 12174. | 55450. | 4.5548 |
| 399 | 725.00 | 12094. | 55450. | 4.5848 |
| 561 | 725.00 | 12094. | 55450. | 4.5848 |
| 94 | 725.00 | 12017. | 55450. | 4.6144 |
| 93 | 725.00 | 12017. | 55450. | 4.6144 |
| 1048 | 725.00 | 12017. | 55450. | 4.6144 |
| 1047 | 725.00 | 12017. | 55450. | 4.6144 |
| 935 | 725.00 | 11993. | 55450. | 4.6234 |
| 149 | 725.00 | 11993. | 55450. | 4.6234 |
| 594 | 725.00 | 11969. | 55450. | 4.6327 |
| 612 | 725.00 | 11969. | 55450. | 4.6327 |
| 925 | 725.00 | 11962. | 55450. | 4.6353 |
| 924 | 725.00 | 11962. | 55450. | 4.6353 |
| 175 | 725.00 | 11962. | 55450. | 4.6353 |
| 174 | 725.00 | 11962. | 55450. | 4.6353 |
| 1163 | 725.00 | 11861. | 55450. | 4.6751 |
| 1199 | 725.00 | 11861. | 55450. | 4.6751 |
| 398 | 725.00 | 11781. | 55450. | 4.7066 |
| 560 | 725.00 | 11781. | 55450. | 4.7066 |
| 879 | 725.00 | 11729. | 55450. | 4.7275 |
| 33 | 725.00 | 11729. | 55450. | 4.7275 |
| 327 | 725.00 | 11726. | 55450. | 4.7287 |
| 334 | 725.00 | 11726. | 55450. | 4.7287 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 328 | 725.00 | 11726. | 55450. | 4.7287 |
| 333 | 725.00 | 11726. | 55450. | 4.7287 |
| 930 | 725.00 | 11710. | 55450. | 4.7351 |
| 180 | 725.00 | 11710. | 55450. | 4.7351 |
| 308 | 725.00 | 11692. | 55450. | 4.7425 |
| 290 | 725.00 | 11692. | 55450. | 4.7425 |
| 1009 | 725.00 | 11690. | 55450. | 4.7434 |
| 67 | 725.00 | 11690. | 55450. | 4.7434 |
| 421 | 725.00 | 11639. | 55450. | 4.7642 |
| 571 | 725.00 | 11639. | 55450. | 4.7642 |
| 1012 | 725.00 | 11603. | 55450. | 4.7791 |
| 70 | 725.00 | 11603. | 55450. | 4.7791 |
| 878 | 725.00 | 11561. | 55450. | 4.7963 |
| 32 | 725.00 | 11561. | 55450. | 4.7963 |
| 606 | 725.00 | 11559. | 55450. | 4.7973 |
| 607 | 725.00 | 11559. | 55450. | 4.7973 |
| 589 | 725.00 | 11559. | 55450. | 4.7973 |
| 588 | 725.00 | 11559. | 55450. | 4.7973 |
| 138 | 725.00 | 11552. | 55450. | 4.7999 |
| 1152 | 725.00 | 11552. | 55450. | 4.7999 |
| 324 | 725.00 | 11459. | 55450. | 4.8390 |
| 306 | 725.00 | 11459. | 55450. | 4.8390 |
| 1054 | 725.00 | 11452. | 55450. | 4.8420 |
| 1053 | 725.00 | 11452. | 55450. | 4.8420 |
| 87 | 725.00 | 11452. | 55450. | 4.8420 |
| 88 | 725.00 | 11452. | 55450. | 4.8420 |
| 637 | 725.00 | 11381. | 55450. | 4.8723 |
| 636 | 725.00 | 11381. | 55450. | 4.8723 |
| 751 | 725.00 | 11381. | 55450. | 4.8723 |
| 750 | 725.00 | 11381. | 55450. | 4.8723 |
| 885 | 725.00 | 11374. | 55450. | 4.8753 |
| 886 | 725.00 | 11374. | 55450. | 4.8753 |
| 4 | 725.00 | 11374. | 55450. | 4.8753 |
| 3 | 725.00 | 11374. | 55450. | 4.8753 |
| 1187 | 725.00 | 11306. | 55450. | 4.9044 |
| 1175 | 725.00 | 11306. | 55450. | 4.9044 |
| 929 | 725.00 | 11257. | 55450. | 4.9260 |
| 179 | 725.00 | 11257. | 55450. | 4.9260 |
| 1010 | 725.00 | 11192. | 55450. | 4.9544 |
| 68 | 725.00 | 11192. | 55450. | 4.9544 |
| 1075 | 725.00 | 11112. | 55450. | 4.9899 |
| 193 | 725.00 | 11112. | 55450. | 4.9899 |
| 1076 | 725.00 | 11077. | 55450. | 5.0060 |
| 194 | 725.00 | 11077. | 55450. | 5.0060 |
| 1103 | 725.00 | 10950. | 55450. | 5.0639 |
| 1102 | 725.00 | 10950. | 55450. | 5.0639 |
| 232 | 725.00 | 10950. | 55450. | 5.0639 |
| 233 | 725.00 | 10950. | 55450. | 5.0639 |
| 292 | 725.00 | 10906. | 55450. | 5.0845 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 310 | 725.00 | 10906. | 55450. | 5.0845 |
| 678 | 725.00 | 10851. | 55450. | 5.1099 |
| 840 | 725.00 | 10851. | 55450. | 5.1099 |
| 905 | 725.00 | 10613. | 55450. | 5.2248 |
| 904 | 725.00 | 10613. | 55450. | 5.2248 |
| 47 | 725.00 | 10613. | 55450. | 5.2248 |
| 46 | 725.00 | 10613. | 55450. | 5.2248 |
| 1166 | 725.00 | 10556. | 55450. | 5.2531 |
| 1178 | 725.00 | 10556. | 55450. | 5.2531 |
| 650 | 725.00 | 10345. | 55450. | 5.3599 |
| 728 | 725.00 | 10345. | 55450. | 5.3599 |
| 1168 | 725.00 | 10217. | 55450. | 5.4270 |
| 1180 | 725.00 | 10217. | 55450. | 5.4270 |
| 142 | 725.00 | 10175. | 55450. | 5.4497 |
| 143 | 725.00 | 10175. | 55450. | 5.4497 |
| 1144 | 725.00 | 10175. | 55450. | 5.4497 |
| 1145 | 725.00 | 10175. | 55450. | 5.4497 |
| 889 | 725.00 | 10145. | 55450. | 5.4657 |
| 7 | 725.00 | 10145. | 55450. | 5.4657 |
| 1077 | 725.00 | 10128. | 55450. | 5.4749 |
| 195 | 725.00 | 10128. | 55450. | 5.4749 |
| 1206 | 725.00 | 10094. | 55450. | 5.4932 |
| 1231 | 725.00 | 10094. | 55450. | 5.4932 |
| 670 | 725.00 | 9897.0 | 55450. | 5.6027 |
| 671 | 725.00 | 9897.0 | 55450. | 5.6027 |
| 761 | 725.00 | 9897.0 | 55450. | 5.6027 |
| 760 | 725.00 | 9897.0 | 55450. | 5.6027 |
| 809 | 725.00 | 9883.2 | 55450. | 5.6105 |
| 815 | 725.00 | 9883.2 | 55450. | 5.6105 |
| 316 | 725.00 | 9875.3 | 55450. | 5.6150 |
| 298 | 725.00 | 9875.3 | 55450. | 5.6150 |
| 1191 | 725.00 | 9874.6 | 55450. | 5.6154 |
| 1155 | 725.00 | 9874.6 | 55450. | 5.6154 |
| 568 | 725.00 | 9780.4 | 55450. | 5.6695 |
| 567 | 725.00 | 9780.4 | 55450. | 5.6695 |
| 430 | 725.00 | 9780.4 | 55450. | 5.6695 |
| 429 | 725.00 | 9780.4 | 55450. | 5.6695 |
| 1202 | 725.00 | 9771.9 | 55450. | 5.6744 |
| 1237 | 725.00 | 9771.9 | 55450. | 5.6744 |
| 450 | 725.00 | 9696.3 | 55450. | 5.7187 |
| 372 | 725.00 | 9696.3 | 55450. | 5.7187 |
| 1197 | 725.00 | 9633.5 | 55450. | 5.7559 |
| 1161 | 725.00 | 9633.5 | 55450. | 5.7559 |
| 792 | 725.00 | 9623.6 | 55450. | 5.7619 |
| 774 | 725.00 | 9623.6 | 55450. | 5.7619 |
| 76 | 725.00 | 9516.4 | 55450. | 5.8268 |
| 1018 | 725.00 | 9516.4 | 55450. | 5.8268 |
| 276 | 725.00 | 9503.3 | 55450. | 5.8348 |
| 978 | 725.00 | 9503.3 | 55450. | 5.8348 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 874 | 725.00 | 9482.5 | 55450. | 5.8476 |
| 28 | 725.00 | 9482.5 | 55450. | 5.8476 |
| 317 | 725.00 | 9482.3 | 55450. | 5.8478 |
| 299 | 725.00 | 9482.3 | 55450. | 5.8478 |
| 791 | 725.00 | 9465.8 | 55450. | 5.8579 |
| 773 | 725.00 | 9465.8 | 55450. | 5.8579 |
| 376 | 725.00 | 9463.5 | 55450. | 5.8594 |
| 377 | 725.00 | 9463.5 | 55450. | 5.8594 |
| 479 | 725.00 | 9463.5 | 55450. | 5.8594 |
| 478 | 725.00 | 9463.5 | 55450. | 5.8594 |
| 449 | 725.00 | 9414.4 | 55450. | 5.8899 |
| 371 | 725.00 | 9414.4 | 55450. | 5.8899 |
| 144 | 725.00 | 9365.1 | 55450. | 5.9209 |
| 1146 | 725.00 | 9365.1 | 55450. | 5.9209 |
| 329 | 725.00 | 9303.0 | 55450. | 5.9604 |
| 335 | 725.00 | 9303.0 | 55450. | 5.9604 |
| 212 | 725.00 | 9248.4 | 55450. | 5.9956 |
| 1058 | 725.00 | 9248.4 | 55450. | 5.9956 |
| 66 | 725.00 | 9233.6 | 55450. | 6.0052 |
| 1044 | 725.00 | 9233.6 | 55450. | 6.0052 |
| 639 | 725.00 | 9216.2 | 55450. | 6.0166 |
| 753 | 725.00 | 9216.2 | 55450. | 6.0166 |
| 675 | 725.00 | 9190.5 | 55450. | 6.0334 |
| 837 | 725.00 | 9190.5 | 55450. | 6.0334 |
| 838 | 725.00 | 9190.5 | 55450. | 6.0334 |
| 676 | 725.00 | 9190.5 | 55450. | 6.0334 |
| 77 | 725.00 | 9171.2 | 55450. | 6.0461 |
| 1019 | 725.00 | 9171.2 | 55450. | 6.0461 |
| 877 | 725.00 | 9162.1 | 55450. | 6.0521 |
| 31 | 725.00 | 9162.1 | 55450. | 6.0521 |
| 331 | 725.00 | 9130.4 | 55450. | 6.0731 |
| 325 | 725.00 | 9130.4 | 55450. | 6.0731 |
| 729 | 725.00 | 9082.8 | 55450. | 6.1049 |
| 651 | 725.00 | 9082.8 | 55450. | 6.1049 |
| 638 | 725.00 | 9052.3 | 55450. | 6.1255 |
| 752 | 725.00 | 9052.3 | 55450. | 6.1255 |
| 569 | 725.00 | 9001.8 | 55450. | 6.1599 |
| 431 | 725.00 | 9001.8 | 55450. | 6.1599 |
| 677 | 725.00 | 8993.8 | 55450. | 6.1654 |
| 839 | 725.00 | 8993.8 | 55450. | 6.1654 |
| 275 | 725.00 | 8979.6 | 55450. | 6.1751 |
| 977 | 725.00 | 8979.6 | 55450. | 6.1751 |
| 805 | 725.00 | 8942.8 | 55450. | 6.2005 |
| 811 | 725.00 | 8942.8 | 55450. | 6.2005 |
| 875 | 725.00 | 8936.5 | 55450. | 6.2049 |
| 29 | 725.00 | 8936.5 | 55450. | 6.2049 |
| 1049 | 725.00 | 8860.8 | 55450. | 6.2579 |
| 95 | 725.00 | 8860.8 | 55450. | 6.2579 |
| 660 | 725.00 | 8825.9 | 55450. | 6.2827 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 738 | 725.00 | 8825.9 | 55450. | 6.2827 |
| 559 | 725.00 | 8809.0 | 55450. | 6.2947 |
| 397 | 725.00 | 8809.0 | 55450. | 6.2947 |
| 469 | 725.00 | 8758.7 | 55450. | 6.3309 |
| 379 | 725.00 | 8758.7 | 55450. | 6.3309 |
| 1190 | 725.00 | 8754.6 | 55450. | 6.3338 |
| 1154 | 725.00 | 8754.6 | 55450. | 6.3338 |
| 1011 | 725.00 | 8707.9 | 55450. | 6.3678 |
| 69 | 725.00 | 8707.9 | 55450. | 6.3678 |
| 1196 | 725.00 | 8663.2 | 55450. | 6.4006 |
| 1160 | 725.00 | 8663.2 | 55450. | 6.4006 |
| 141 | 725.00 | 8638.9 | 55450. | 6.4187 |
| 1143 | 725.00 | 8638.9 | 55450. | 6.4187 |
| 396 | 725.00 | 8607.4 | 55450. | 6.4421 |
| 558 | 725.00 | 8607.4 | 55450. | 6.4421 |
| 321 | 725.00 | 8509.9 | 55450. | 6.5160 |
| 303 | 725.00 | 8509.9 | 55450. | 6.5160 |
| 320 | 725.00 | 8503.8 | 55450. | 6.5206 |
| 302 | 725.00 | 8503.8 | 55450. | 6.5206 |
| 1055 | 725.00 | 8486.1 | 55450. | 6.5342 |
| 89 | 725.00 | 8486.1 | 55450. | 6.5342 |
| 659 | 725.00 | 8441.7 | 55450. | 6.5686 |
| 737 | 725.00 | 8441.7 | 55450. | 6.5686 |
| 73 | 725.00 | 8408.5 | 55450. | 6.5945 |
| 1015 | 725.00 | 8408.5 | 55450. | 6.5945 |
| 1051 | 725.00 | 8302.0 | 55450. | 6.6791 |
| 85 | 725.00 | 8302.0 | 55450. | 6.6791 |
| 470 | 725.00 | 8249.8 | 55450. | 6.7213 |
| 380 | 725.00 | 8249.8 | 55450. | 6.7213 |
| 108 | 725.00 | 8233.2 | 55450. | 6.7349 |
| 1134 | 725.00 | 8233.2 | 55450. | 6.7349 |
| 1078 | 725.00 | 8156.1 | 55450. | 6.7986 |
| 196 | 725.00 | 8156.1 | 55450. | 6.7986 |
| 65 | 725.00 | 8140.9 | 55450. | 6.8113 |
| 1043 | 725.00 | 8140.9 | 55450. | 6.8113 |
| 1228 | 725.00 | 8004.0 | 55450. | 6.9278 |
| 1214 | 725.00 | 8004.0 | 55450. | 6.9278 |
| 1213 | 725.00 | 8004.0 | 55450. | 6.9278 |
| 1229 | 725.00 | 8004.0 | 55450. | 6.9278 |
| 1204 | 725.00 | 7997.5 | 55450. | 6.9334 |
| 1203 | 725.00 | 7997.5 | 55450. | 6.9334 |
| 1239 | 725.00 | 7997.5 | 55450. | 6.9334 |
| 1238 | 725.00 | 7997.5 | 55450. | 6.9334 |
| 1194 | 725.00 | 7995.2 | 55450. | 6.9354 |
| 1158 | 725.00 | 7995.2 | 55450. | 6.9354 |
| 1080 | 725.00 | 7986.4 | 55450. | 6.9431 |
| 198 | 725.00 | 7986.4 | 55450. | 6.9431 |
| 15 | 725.00 | 7950.2 | 55450. | 6.9746 |
| 897 | 725.00 | 7950.2 | 55450. | 6.9746 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 319 | 725.00 | 7878.3 | 55450. | 7.0383 |
| 301 | 725.00 | 7878.3 | 55450. | 7.0383 |
| 1230 | 725.00 | 7735.5 | 55450. | 7.1683 |
| 1215 | 725.00 | 7735.5 | 55450. | 7.1683 |
| 92 | 725.00 | 7706.7 | 55450. | 7.1950 |
| 1046 | 725.00 | 7706.7 | 55450. | 7.1950 |
| 787 | 725.00 | 7652.5 | 55450. | 7.2460 |
| 769 | 725.00 | 7652.5 | 55450. | 7.2460 |
| 643 | 725.00 | 7641.1 | 55450. | 7.2569 |
| 721 | 725.00 | 7641.1 | 55450. | 7.2569 |
| 448 | 725.00 | 7631.8 | 55450. | 7.2657 |
| 370 | 725.00 | 7631.8 | 55450. | 7.2657 |
| 45 | 725.00 | 7588.4 | 55450. | 7.3073 |
| 903 | 725.00 | 7588.4 | 55450. | 7.3073 |
| 234 | 725.00 | 7563.5 | 55450. | 7.3313 |
| 1104 | 725.00 | 7563.5 | 55450. | 7.3313 |
| 1079 | 725.00 | 7559.8 | 55450. | 7.3348 |
| 197 | 725.00 | 7559.8 | 55450. | 7.3348 |
| 1167 | 725.00 | 7518.9 | 55450. | 7.3748 |
| 1179 | 725.00 | 7518.9 | 55450. | 7.3748 |
| 640 | 725.00 | 7513.2 | 55450. | 7.3804 |
| 754 | 725.00 | 7513.2 | 55450. | 7.3804 |
| 1140 | 725.00 | 7409.1 | 55450. | 7.4841 |
| 114 | 725.00 | 7409.1 | 55450. | 7.4841 |
| 447 | 725.00 | 7405.5 | 55450. | 7.4876 |
| 369 | 725.00 | 7405.5 | 55450. | 7.4876 |
| 1045 | 725.00 | 7324.5 | 55450. | 7.5705 |
| 91 | 725.00 | 7324.5 | 55450. | 7.5705 |
| 871 | 725.00 | 7294.1 | 55450. | 7.6020 |
| 25 | 725.00 | 7294.1 | 55450. | 7.6020 |
| 1139 | 725.00 | 7286.3 | 55450. | 7.6101 |
| 113 | 725.00 | 7286.3 | 55450. | 7.6101 |
| 332 | 725.00 | 7266.3 | 55450. | 7.6312 |
| 326 | 725.00 | 7266.3 | 55450. | 7.6312 |
| 547 | 725.00 | 7237.7 | 55450. | 7.6612 |
| 385 | 725.00 | 7237.7 | 55450. | 7.6612 |
| 644 | 725.00 | 7220.0 | 55450. | 7.6800 |
| 722 | 725.00 | 7220.0 | 55450. | 7.6800 |
| 446 | 725.00 | 7186.2 | 55450. | 7.7161 |
| 368 | 725.00 | 7186.2 | 55450. | 7.7161 |
| 295 | 725.00 | 7126.3 | 55450. | 7.7810 |
| 313 | 725.00 | 7126.3 | 55450. | 7.7810 |
| 788 | 725.00 | 7103.8 | 55450. | 7.8056 |
| 770 | 725.00 | 7103.8 | 55450. | 7.8056 |
| 505 | 725.00 | 7095.5 | 55450. | 7.8148 |
| 487 | 725.00 | 7095.5 | 55450. | 7.8148 |
| 486 | 725.00 | 7076.8 | 55450. | 7.8354 |
| 504 | 725.00 | 7076.8 | 55450. | 7.8354 |
| 812 | 725.00 | 7067.3 | 55450. | 7.8460 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 806 | 725.00 | 7067.3 | 55450. | 7.8460 |
| 1135 | 725.00 | 6988.8 | 55450. | 7.9341 |
| 1136 | 725.00 | 6988.8 | 55450. | 7.9341 |
| 109 | 725.00 | 6988.8 | 55450. | 7.9341 |
| 110 | 725.00 | 6988.8 | 55450. | 7.9341 |
| 1057 | 725.00 | 6984.6 | 55450. | 7.9389 |
| 211 | 725.00 | 6984.6 | 55450. | 7.9389 |
| 86 | 725.00 | 6951.8 | 55450. | 7.9763 |
| 1052 | 725.00 | 6951.8 | 55450. | 7.9763 |
| 548 | 725.00 | 6947.7 | 55450. | 7.9811 |
| 386 | 725.00 | 6947.7 | 55450. | 7.9811 |
| 763 | 725.00 | 6939.2 | 55450. | 7.9909 |
| 661 | 725.00 | 6939.2 | 55450. | 7.9909 |
| 1101 | 725.00 | 6870.5 | 55450. | 8.0708 |
| 231 | 725.00 | 6870.5 | 55450. | 8.0708 |
| 790 | 725.00 | 6783.5 | 55450. | 8.1743 |
| 772 | 725.00 | 6783.5 | 55450. | 8.1743 |
| 517 | 725.00 | 6762.4 | 55450. | 8.1997 |
| 523 | 725.00 | 6762.4 | 55450. | 8.1997 |
| 111 | 725.00 | 6744.7 | 55450. | 8.2212 |
| 1137 | 725.00 | 6744.7 | 55450. | 8.2212 |
| 270 | 725.00 | 6740.4 | 55450. | 8.2265 |
| 972 | 725.00 | 6740.4 | 55450. | 8.2265 |
| 518 | 725.00 | 6729.7 | 55450. | 8.2396 |
| 524 | 725.00 | 6729.7 | 55450. | 8.2396 |
| 1226 | 725.00 | 6687.1 | 55450. | 8.2921 |
| 1211 | 725.00 | 6687.1 | 55450. | 8.2921 |
| 474 | 725.00 | 6686.0 | 55450. | 8.2934 |
| 384 | 725.00 | 6686.0 | 55450. | 8.2934 |
| 112 | 725.00 | 6681.0 | 55450. | 8.2997 |
| 1138 | 725.00 | 6681.0 | 55450. | 8.2997 |
| 898 | 725.00 | 6563.0 | 55450. | 8.4489 |
| 16 | 725.00 | 6563.0 | 55450. | 8.4489 |
| 217 | 725.00 | 6536.5 | 55450. | 8.4831 |
| 1063 | 725.00 | 6536.5 | 55450. | 8.4831 |
| 764 | 725.00 | 6497.7 | 55450. | 8.5338 |
| 662 | 725.00 | 6497.7 | 55450. | 8.5338 |
| 83 | 725.00 | 6458.3 | 55450. | 8.5858 |
| 82 | 725.00 | 6458.3 | 55450. | 8.5858 |
| 1025 | 725.00 | 6458.3 | 55450. | 8.5858 |
| 1024 | 725.00 | 6458.3 | 55450. | 8.5858 |
| 81 | 725.00 | 6434.8 | 55450. | 8.6173 |
| 1023 | 725.00 | 6434.8 | 55450. | 8.6173 |
| 84 | 725.00 | 6428.3 | 55450. | 8.6259 |
| 1026 | 725.00 | 6428.3 | 55450. | 8.6259 |
| 80 | 725.00 | 6404.2 | 55450. | 8.6583 |
| 1022 | 725.00 | 6404.2 | 55450. | 8.6583 |
| 1098 | 725.00 | 6318.9 | 55450. | 8.7753 |
| 240 | 725.00 | 6318.9 | 55450. | 8.7753 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 480 | 725.00 | 6267.8 | 55450. | 8.8468 |
| 378 | 725.00 | 6267.8 | 55450. | 8.8468 |
| 235 | 725.00 | 6231.2 | 55450. | 8.8987 |
| 1093 | 725.00 | 6231.2 | 55450. | 8.8987 |
| 300 | 725.00 | 6229.6 | 55450. | 8.9011 |
| 318 | 725.00 | 6229.6 | 55450. | 8.9011 |
| 551 | 725.00 | 6216.2 | 55450. | 8.9203 |
| 550 | 725.00 | 6216.2 | 55450. | 8.9203 |
| 388 | 725.00 | 6216.2 | 55450. | 8.9203 |
| 389 | 725.00 | 6216.2 | 55450. | 8.9203 |
| 672 | 725.00 | 6196.6 | 55450. | 8.9485 |
| 762 | 725.00 | 6196.6 | 55450. | 8.9485 |
| 42 | 725.00 | 6184.4 | 55450. | 8.9662 |
| 912 | 725.00 | 6184.4 | 55450. | 8.9662 |
| 906 | 725.00 | 6171.3 | 55450. | 8.9852 |
| 48 | 725.00 | 6171.3 | 55450. | 8.9852 |
| 759 | 725.00 | 6131.4 | 55450. | 9.0437 |
| 669 | 725.00 | 6131.4 | 55450. | 9.0437 |
| 477 | 725.00 | 6129.8 | 55450. | 9.0460 |
| 375 | 725.00 | 6129.8 | 55450. | 9.0460 |
| 852 | 725.00 | 6120.6 | 55450. | 9.0596 |
| 690 | 725.00 | 6120.6 | 55450. | 9.0596 |
| 648 | 725.00 | 6089.1 | 55450. | 9.1064 |
| 726 | 725.00 | 6089.1 | 55450. | 9.1064 |
| 519 | 725.00 | 6055.8 | 55450. | 9.1565 |
| 525 | 725.00 | 6055.8 | 55450. | 9.1565 |
| 647 | 725.00 | 6055.0 | 55450. | 9.1577 |
| 725 | 725.00 | 6055.0 | 55450. | 9.1577 |
| 291 | 725.00 | 6055.0 | 55450. | 9.1577 |
| 309 | 725.00 | 6055.0 | 55450. | 9.1577 |
| 658 | 725.00 | 5941.2 | 55450. | 9.3331 |
| 736 | 725.00 | 5941.2 | 55450. | 9.3331 |
| 187 | 725.00 | 5915.0 | 55450. | 9.3745 |
| 949 | 725.00 | 5915.0 | 55450. | 9.3745 |
| 188 | 725.00 | 5903.3 | 55450. | 9.3930 |
| 950 | 725.00 | 5903.3 | 55450. | 9.3930 |
| 282 | 725.00 | 5885.6 | 55450. | 9.4213 |
| 1008 | 725.00 | 5885.6 | 55450. | 9.4213 |
| 78 | 725.00 | 5846.3 | 55450. | 9.4846 |
| 1020 | 725.00 | 5846.3 | 55450. | 9.4846 |
| 851 | 725.00 | 5833.2 | 55450. | 9.5060 |
| 689 | 725.00 | 5833.2 | 55450. | 9.5060 |
| 37 | 725.00 | 5818.0 | 55450. | 9.5308 |
| 907 | 725.00 | 5818.0 | 55450. | 9.5308 |
| 552 | 725.00 | 5812.4 | 55450. | 9.5399 |
| 390 | 725.00 | 5812.4 | 55450. | 9.5399 |
| 1094 | 725.00 | 5787.9 | 55450. | 9.5803 |
| 236 | 725.00 | 5787.9 | 55450. | 9.5803 |
| 30 | 725.00 | 5739.9 | 55450. | 9.6604 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 876 | 725.00 | 5739.9 | 55450. | 9.6604 |
| 1236 | 725.00 | 5639.6 | 55450. | 9.8323 |
| 1201 | 725.00 | 5639.6 | 55450. | 9.8323 |
| 34 | 725.00 | 5624.1 | 55450. | 9.8594 |
| 880 | 725.00 | 5624.1 | 55450. | 9.8594 |
| 79 | 725.00 | 5616.2 | 55450. | 9.8733 |
| 1021 | 725.00 | 5616.2 | 55450. | 9.8733 |
| 1081 | 725.00 | 5615.8 | 55450. | 9.8740 |
| 199 | 725.00 | 5615.8 | 55450. | 9.8740 |
| 657 | 725.00 | 5612.7 | 55450. | 9.8794 |
| 735 | 725.00 | 5612.7 | 55450. | 9.8794 |
| 387 | 725.00 | 5596.6 | 55450. | 9.9078 |
| 549 | 725.00 | 5596.6 | 55450. | 9.9078 |
| 583 | 725.00 | 5574.8 | 55450. | 9.9465 |
| 601 | 725.00 | 5574.8 | 55450. | 9.9465 |
| 181 | 725.00 | 5563.3 | 55450. | 9.9671 |
| 955 | 725.00 | 5563.3 | 55450. | 9.9671 |
| 182 | 725.00 | 5559.4 | 55450. | 9.9742 |
| 956 | 725.00 | 5559.4 | 55450. | 9.9742 |
| 274 | 725.00 | 5500.8 | 55450. | 10.080 |
| 976 | 725.00 | 5500.8 | 55450. | 10.080 |
| 41 | 725.00 | 5465.1 | 55450. | 10.146 |
| 911 | 725.00 | 5465.1 | 55450. | 10.146 |
| 1097 | 725.00 | 5440.6 | 55450. | 10.192 |
| 239 | 725.00 | 5440.6 | 55450. | 10.192 |
| 281 | 725.00 | 5431.0 | 55450. | 10.210 |
| 1007 | 725.00 | 5431.0 | 55450. | 10.210 |
| 189 | 725.00 | 5417.8 | 55450. | 10.235 |
| 951 | 725.00 | 5417.8 | 55450. | 10.235 |
| 768 | 725.00 | 5394.0 | 55450. | 10.280 |
| 666 | 725.00 | 5394.0 | 55450. | 10.280 |
| 38 | 725.00 | 5384.7 | 55450. | 10.298 |
| 908 | 725.00 | 5384.7 | 55450. | 10.298 |
| 656 | 725.00 | 5291.1 | 55450. | 10.480 |
| 734 | 725.00 | 5291.1 | 55450. | 10.480 |
| 473 | 725.00 | 5289.8 | 55450. | 10.482 |
| 383 | 725.00 | 5289.8 | 55450. | 10.482 |
| 277 | 725.00 | 5252.7 | 55450. | 10.556 |
| 1003 | 725.00 | 5252.7 | 55450. | 10.556 |
| 445 | 725.00 | 5239.8 | 55450. | 10.582 |
| 367 | 725.00 | 5239.8 | 55450. | 10.582 |
| 1189 | 725.00 | 5144.0 | 55450. | 10.780 |
| 1153 | 725.00 | 5144.0 | 55450. | 10.780 |
| 183 | 725.00 | 5143.1 | 55450. | 10.781 |
| 957 | 725.00 | 5143.1 | 55450. | 10.781 |
| 646 | 725.00 | 5123.7 | 55450. | 10.822 |
| 724 | 725.00 | 5123.7 | 55450. | 10.822 |
| 154 | 725.00 | 5095.2 | 55450. | 10.883 |
| 940 | 725.00 | 5095.2 | 55450. | 10.883 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1216 | 725.00 | 5044.6 | 55450. | 10.992 |
| 1221 | 725.00 | 5044.6 | 55450. | 10.992 |
| 273 | 725.00 | 5032.8 | 55450. | 11.018 |
| 975 | 725.00 | 5032.8 | 55450. | 11.018 |
| 1002 | 725.00 | 4979.2 | 55450. | 11.136 |
| 288 | 725.00 | 4979.2 | 55450. | 11.136 |
| 1004 | 725.00 | 4858.0 | 55450. | 11.414 |
| 278 | 725.00 | 4858.0 | 55450. | 11.414 |
| 155 | 725.00 | 4818.0 | 55450. | 11.509 |
| 941 | 725.00 | 4818.0 | 55450. | 11.509 |
| 151 | 725.00 | 4782.7 | 55450. | 11.594 |
| 937 | 725.00 | 4782.7 | 55450. | 11.594 |
| 443 | 725.00 | 4699.2 | 55450. | 11.800 |
| 444 | 725.00 | 4699.2 | 55450. | 11.800 |
| 365 | 725.00 | 4699.2 | 55450. | 11.800 |
| 366 | 725.00 | 4699.2 | 55450. | 11.800 |
| 520 | 725.00 | 4696.7 | 55450. | 11.806 |
| 526 | 725.00 | 4696.7 | 55450. | 11.806 |
| 63 | 725.00 | 4694.9 | 55450. | 11.811 |
| 1041 | 725.00 | 4694.9 | 55450. | 11.811 |
| 767 | 725.00 | 4601.5 | 55450. | 12.050 |
| 665 | 725.00 | 4601.5 | 55450. | 12.050 |
| 272 | 725.00 | 4571.8 | 55450. | 12.129 |
| 974 | 725.00 | 4571.8 | 55450. | 12.129 |
| 364 | 725.00 | 4485.9 | 55450. | 12.361 |
| 442 | 725.00 | 4485.9 | 55450. | 12.361 |
| 62 | 725.00 | 4438.7 | 55450. | 12.492 |
| 1040 | 725.00 | 4438.7 | 55450. | 12.492 |
| 528 | 725.00 | 4363.8 | 55450. | 12.707 |
| 522 | 725.00 | 4363.8 | 55450. | 12.707 |
| 280 | 725.00 | 4291.2 | 55450. | 12.922 |
| 1006 | 725.00 | 4291.2 | 55450. | 12.922 |
| 620 | 725.00 | 4276.7 | 55450. | 12.966 |
| 621 | 725.00 | 4276.7 | 55450. | 12.966 |
| 614 | 725.00 | 4276.7 | 55450. | 12.966 |
| 615 | 725.00 | 4276.7 | 55450. | 12.966 |
| 1173 | 725.00 | 4248.9 | 55450. | 13.050 |
| 1185 | 725.00 | 4248.9 | 55450. | 13.050 |
| 190 | 725.00 | 4247.2 | 55450. | 13.056 |
| 952 | 725.00 | 4247.2 | 55450. | 13.056 |
| 865 | 725.00 | 4183.4 | 55450. | 13.255 |
| 19 | 725.00 | 4183.4 | 55450. | 13.255 |
| 460 | 725.00 | 4168.3 | 55450. | 13.303 |
| 346 | 725.00 | 4168.3 | 55450. | 13.303 |
| 471 | 725.00 | 4072.6 | 55450. | 13.615 |
| 381 | 725.00 | 4072.6 | 55450. | 13.615 |
| 40 | 725.00 | 4060.7 | 55450. | 13.655 |
| 910 | 725.00 | 4060.7 | 55450. | 13.655 |
| 271 | 725.00 | 4048.4 | 55450. | 13.697 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 973 | 725.00 | 4048.4 | 55450. | 13.697 |
| 184 | 725.00 | 4041.6 | 55450. | 13.720 |
| 958 | 725.00 | 4041.6 | 55450. | 13.720 |
| 64 | 725.00 | 4041.2 | 55450. | 13.721 |
| 1042 | 725.00 | 4041.2 | 55450. | 13.721 |
| 463 | 725.00 | 4023.5 | 55450. | 13.781 |
| 462 | 725.00 | 4023.5 | 55450. | 13.781 |
| 348 | 725.00 | 4023.5 | 55450. | 13.781 |
| 349 | 725.00 | 4023.5 | 55450. | 13.781 |
| 850 | 725.00 | 4011.8 | 55450. | 13.822 |
| 688 | 725.00 | 4011.8 | 55450. | 13.822 |
| 464 | 725.00 | 3987.9 | 55450. | 13.905 |
| 350 | 725.00 | 3987.9 | 55450. | 13.905 |
| 1096 | 725.00 | 3946.3 | 55450. | 14.051 |
| 238 | 725.00 | 3946.3 | 55450. | 14.051 |
| 613 | 725.00 | 3943.9 | 55450. | 14.060 |
| 619 | 725.00 | 3943.9 | 55450. | 14.060 |
| 461 | 725.00 | 3938.1 | 55450. | 14.080 |
| 347 | 725.00 | 3938.1 | 55450. | 14.080 |
| 616 | 725.00 | 3924.2 | 55450. | 14.130 |
| 622 | 725.00 | 3924.2 | 55450. | 14.130 |
| 866 | 725.00 | 3917.6 | 55450. | 14.154 |
| 20 | 725.00 | 3917.6 | 55450. | 14.154 |
| 150 | 725.00 | 3855.1 | 55450. | 14.384 |
| 936 | 725.00 | 3855.1 | 55450. | 14.384 |
| 849 | 725.00 | 3780.0 | 55450. | 14.669 |
| 687 | 725.00 | 3780.0 | 55450. | 14.669 |
| 1195 | 725.00 | 3617.2 | 55450. | 15.329 |
| 1159 | 725.00 | 3617.2 | 55450. | 15.329 |
| 1217 | 725.00 | 3595.8 | 55450. | 15.421 |
| 709 | 725.00 | 3595.8 | 55450. | 15.421 |
| 859 | 725.00 | 3595.8 | 55450. | 15.421 |
| 1222 | 725.00 | 3595.8 | 55450. | 15.421 |
| 186 | 725.00 | 3582.4 | 55450. | 15.478 |
| 960 | 725.00 | 3582.4 | 55450. | 15.478 |
| 192 | 725.00 | 3580.4 | 55450. | 15.487 |
| 954 | 725.00 | 3580.4 | 55450. | 15.487 |
| 848 | 725.00 | 3555.2 | 55450. | 15.597 |
| 686 | 725.00 | 3555.2 | 55450. | 15.597 |
| 1174 | 725.00 | 3440.7 | 55450. | 16.116 |
| 1186 | 725.00 | 3440.7 | 55450. | 16.116 |
| 600 | 725.00 | 3406.3 | 55450. | 16.279 |
| 582 | 725.00 | 3406.3 | 55450. | 16.279 |
| 652 | 725.00 | 3399.4 | 55450. | 16.312 |
| 730 | 725.00 | 3399.4 | 55450. | 16.312 |
| 653 | 725.00 | 3392.5 | 55450. | 16.345 |
| 731 | 725.00 | 3392.5 | 55450. | 16.345 |
| 789 | 725.00 | 3333.2 | 55450. | 16.636 |
| 771 | 725.00 | 3333.2 | 55450. | 16.636 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1220 | 725.00 | 3324.6 | 55450. | 16.679 |
| 1225 | 725.00 | 3324.6 | 55450. | 16.679 |
| 1218 | 725.00 | 3240.8 | 55450. | 17.110 |
| 1223 | 725.00 | 3240.8 | 55450. | 17.110 |
| 472 | 725.00 | 3208.4 | 55450. | 17.283 |
| 382 | 725.00 | 3208.4 | 55450. | 17.283 |
| 645 | 725.00 | 3169.5 | 55450. | 17.495 |
| 723 | 725.00 | 3169.5 | 55450. | 17.495 |
| 766 | 725.00 | 3123.9 | 55450. | 17.750 |
| 664 | 725.00 | 3123.9 | 55450. | 17.750 |
| 868 | 725.00 | 3042.9 | 55450. | 18.223 |
| 869 | 725.00 | 3042.9 | 55450. | 18.223 |
| 23 | 725.00 | 3042.9 | 55450. | 18.223 |
| 22 | 725.00 | 3042.9 | 55450. | 18.223 |
| 264 | 725.00 | 3017.3 | 55450. | 18.377 |
| 966 | 725.00 | 3017.3 | 55450. | 18.377 |
| 465 | 725.00 | 2929.0 | 55450. | 18.932 |
| 351 | 725.00 | 2929.0 | 55450. | 18.932 |
| 765 | 725.00 | 2924.3 | 55450. | 18.962 |
| 663 | 725.00 | 2924.3 | 55450. | 18.962 |
| 623 | 725.00 | 2886.6 | 55450. | 19.210 |
| 617 | 725.00 | 2886.6 | 55450. | 19.210 |
| 654 | 725.00 | 2862.9 | 55450. | 19.369 |
| 732 | 725.00 | 2862.9 | 55450. | 19.369 |
| 21 | 725.00 | 2787.7 | 55450. | 19.891 |
| 867 | 725.00 | 2787.7 | 55450. | 19.891 |
| 263 | 725.00 | 2751.4 | 55450. | 20.154 |
| 965 | 725.00 | 2751.4 | 55450. | 20.154 |
| 60 | 725.00 | 2665.5 | 55450. | 20.803 |
| 59 | 725.00 | 2665.5 | 55450. | 20.803 |
| 1037 | 725.00 | 2665.5 | 55450. | 20.803 |
| 1038 | 725.00 | 2665.5 | 55450. | 20.803 |
| 521 | 725.00 | 2652.3 | 55450. | 20.906 |
| 527 | 725.00 | 2652.3 | 55450. | 20.906 |
| 159 | 725.00 | 2516.5 | 55450. | 22.034 |
| 158 | 725.00 | 2516.5 | 55450. | 22.034 |
| 944 | 725.00 | 2516.5 | 55450. | 22.034 |
| 945 | 725.00 | 2516.5 | 55450. | 22.034 |
| 160 | 725.00 | 2486.4 | 55450. | 22.302 |
| 946 | 725.00 | 2486.4 | 55450. | 22.302 |
| 775 | 725.00 | 2478.2 | 55450. | 22.375 |
| 793 | 725.00 | 2478.2 | 55450. | 22.375 |
| 279 | 725.00 | 2466.3 | 55450. | 22.483 |
| 1005 | 725.00 | 2466.3 | 55450. | 22.483 |
| 161 | 725.00 | 2449.2 | 55450. | 22.640 |
| 947 | 725.00 | 2449.2 | 55450. | 22.640 |
| 1039 | 725.00 | 2416.3 | 55450. | 22.948 |
| 61 | 725.00 | 2416.3 | 55450. | 22.948 |
| 157 | 725.00 | 2392.8 | 55450. | 23.174 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 943 | 725.00 | 2392.8 | 55450. | 23.174 |
| 953 | 725.00 | 2391.3 | 55450. | 23.188 |
| 191 | 725.00 | 2391.3 | 55450. | 23.188 |
| 1209 | 725.00 | 2371.1 | 55450. | 23.386 |
| 1208 | 725.00 | 2371.1 | 55450. | 23.386 |
| 1233 | 725.00 | 2371.1 | 55450. | 23.386 |
| 1234 | 725.00 | 2371.1 | 55450. | 23.386 |
| 870 | 725.00 | 2274.7 | 55450. | 24.377 |
| 24 | 725.00 | 2274.7 | 55450. | 24.377 |
| 959 | 725.00 | 2254.9 | 55450. | 24.590 |
| 185 | 725.00 | 2254.9 | 55450. | 24.590 |
| 156 | 725.00 | 2237.5 | 55450. | 24.783 |
| 942 | 725.00 | 2237.5 | 55450. | 24.783 |
| 655 | 725.00 | 2224.7 | 55450. | 24.925 |
| 733 | 725.00 | 2224.7 | 55450. | 24.925 |
| 1235 | 725.00 | 2219.6 | 55450. | 24.982 |
| 1210 | 725.00 | 2219.6 | 55450. | 24.982 |
| 1095 | 725.00 | 2197.8 | 55450. | 25.230 |
| 237 | 725.00 | 2197.8 | 55450. | 25.230 |
| 1200 | 725.00 | 2185.8 | 55450. | 25.369 |
| 1164 | 725.00 | 2185.8 | 55450. | 25.369 |
| 1219 | 725.00 | 2005.5 | 55450. | 27.649 |
| 1224 | 725.00 | 2005.5 | 55450. | 27.649 |
| 162 | 725.00 | 1993.5 | 55450. | 27.816 |
| 948 | 725.00 | 1993.5 | 55450. | 27.816 |
| 909 | 725.00 | 1971.1 | 55450. | 28.131 |
| 39 | 725.00 | 1971.1 | 55450. | 28.131 |
| 857 | 725.00 | 1912.1 | 55450. | 28.999 |
| 719 | 725.00 | 1912.1 | 55450. | 28.999 |
| 856 | 725.00 | 1912.1 | 55450. | 28.999 |
| 718 | 725.00 | 1912.1 | 55450. | 28.999 |
| 58 | 725.00 | 1891.3 | 55450. | 29.318 |
| 1036 | 725.00 | 1891.3 | 55450. | 29.318 |
| 714 | 725.00 | 1838.7 | 55450. | 30.157 |
| 864 | 725.00 | 1838.7 | 55450. | 30.157 |
| 717 | 725.00 | 1690.5 | 55450. | 32.800 |
| 855 | 725.00 | 1690.5 | 55450. | 32.800 |
| 1207 | 725.00 | 1625.4 | 55450. | 34.114 |
| 1232 | 725.00 | 1625.4 | 55450. | 34.114 |
| 685 | 725.00 | 1548.3 | 55450. | 35.814 |
| 847 | 725.00 | 1548.3 | 55450. | 35.814 |
| 853 | 725.00 | 1465.3 | 55450. | 37.841 |
| 715 | 725.00 | 1465.3 | 55450. | 37.841 |
| 963 | 725.00 | 1451.2 | 55450. | 38.209 |
| 260 | 725.00 | 1451.2 | 55450. | 38.209 |
| 962 | 725.00 | 1451.2 | 55450. | 38.209 |
| 261 | 725.00 | 1451.2 | 55450. | 38.209 |
| 858 | 725.00 | 1448.5 | 55450. | 38.280 |
| 720 | 725.00 | 1448.5 | 55450. | 38.280 |

Table 6 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 618 | 725.00 | 1404.7 | 55450. | 39.474 |
| 624 | 725.00 | 1404.7 | 55450. | 39.474 |
| 716 | 725.00 | 1240.6 | 55450. | 44.696 |
| 854 | 725.00 | 1240.6 | 55450. | 44.696 |
| 262 | 725.00 | 1194.0 | 55450. | 46.442 |
| 964 | 725.00 | 1194.0 | 55450. | 46.442 |
| 133 | 725.00 | 971.11 | 55450. | 57.099 |
| 1147 | 725.00 | 971.11 | 55450. | 57.099 |
| 259 | 725.00 | 685.15 | 55450. | 80.931 |
| 961 | 725.00 | 685.15 | 55450. | 80.931 |
| 684 | 725.00 | 373.60 | 55450. | 148.42 |
| 846 | 725.00 | 373.60 | 55450. | 148.42 |

Table 7

TITLE=
MPC-24E Structural Analysis

SUBTITLE 1 =
Component: Enclosure Vessel
SUBTITLE 2 =
Load Combination: E2.b (See Table 2.1.7)
SUBTITLE 3 =
Stress Result: Primary Membrane (PM)

PRINT ELEMENT TABLE ITEMS PER ELEMENT

| STAT ELEM | CURRENT REF TEMP | MIXED PM | PREVIOUS ALLOW | PREVIOUS SF |
|---|---|---|---|---|
| 1371 | 450.00 | 6533.6 | 43450. | 6.6502 |
| 1370 | 450.00 | 6533.4 | 43450. | 6.6504 |
| 1372 | 450.00 | 6533.3 | 43450. | 6.6506 |
| 1369 | 450.00 | 6532.7 | 43450. | 6.6511 |
| 1373 | 450.00 | 6498.1 | 43450. | 6.6866 |
| 1374 | 450.00 | 6497.3 | 43450. | 6.6874 |
| 1368 | 450.00 | 6496.2 | 43450. | 6.6886 |
| 1375 | 450.00 | 6494.9 | 43450. | 6.6899 |
| 1367 | 450.00 | 6494.2 | 43450. | 6.6906 |
| 1376 | 450.00 | 6491.0 | 43450. | 6.6938 |
| 1366 | 450.00 | 6490.7 | 43450. | 6.6942 |
| 1365 | 450.00 | 6485.7 | 43450. | 6.6993 |
| 1377 | 450.00 | 6485.7 | 43450. | 6.6994 |
| 1364 | 450.00 | 6479.2 | 43450. | 6.7060 |
| 1378 | 450.00 | 6478.9 | 43450. | 6.7064 |
| 1363 | 450.00 | 6471.4 | 43450. | 6.7142 |
| 1379 | 450.00 | 6470.7 | 43450. | 6.7148 |
| 1362 | 450.00 | 6462.1 | 43450. | 6.7238 |
| 1380 | 450.00 | 6461.4 | 43450. | 6.7245 |
| 1361 | 450.00 | 6458.5 | 43450. | 6.7276 |
| 1381 | 450.00 | 6458.1 | 43450. | 6.7280 |
| 1360 | 450.00 | 6452.8 | 43450. | 6.7335 |
| 1382 | 450.00 | 6452.3 | 43450. | 6.7341 |
| 1359 | 450.00 | 6446.7 | 43450. | 6.7399 |
| 1383 | 450.00 | 6445.9 | 43450. | 6.7407 |
| 1358 | 450.00 | 6436.2 | 43450. | 6.7509 |
| 1384 | 450.00 | 6435.1 | 43450. | 6.7520 |
| 1357 | 450.00 | 6424.5 | 43450. | 6.7631 |
| 1385 | 450.00 | 6423.5 | 43450. | 6.7643 |
| 1356 | 450.00 | 6412.1 | 43450. | 6.7762 |
| 1386 | 450.00 | 6411.1 | 43450. | 6.7773 |
| 1355 | 450.00 | 6399.0 | 43450. | 6.7901 |
| 1387 | 450.00 | 6398.0 | 43450. | 6.7912 |
| 1354 | 450.00 | 6385.2 | 43450. | 6.8048 |
| 1388 | 450.00 | 6384.3 | 43450. | 6.8058 |

Table 7 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1353 | 450.00 | 6370.8 | 43450. | 6.8201 |
| 1389 | 450.00 | 6370.2 | 43450. | 6.8208 |
| 1352 | 450.00 | 6362.1 | 43450. | 6.8296 |
| 1390 | 450.00 | 6361.7 | 43450. | 6.8299 |
| 1351 | 450.00 | 6353.4 | 43450. | 6.8389 |
| 1241 | 450.00 | 6353.1 | 43450. | 6.8392 |
| 1350 | 450.00 | 6338.2 | 43450. | 6.8552 |
| 1242 | 450.00 | 6338.0 | 43450. | 6.8554 |
| 1243 | 450.00 | 6322.8 | 43450. | 6.8720 |
| 1349 | 450.00 | 6322.6 | 43450. | 6.8722 |
| 1244 | 450.00 | 6307.4 | 43450. | 6.8887 |
| 1348 | 450.00 | 6306.8 | 43450. | 6.8894 |
| 1245 | 450.00 | 6291.9 | 43450. | 6.9057 |
| 1347 | 450.00 | 6290.9 | 43450. | 6.9069 |
| 1246 | 450.00 | 6276.6 | 43450. | 6.9226 |
| 1346 | 450.00 | 6274.9 | 43450. | 6.9244 |
| 1247 | 450.00 | 6260.8 | 43450. | 6.9400 |
| 1345 | 450.00 | 6259.1 | 43450. | 6.9419 |
| 1248 | 450.00 | 6250.7 | 43450. | 6.9513 |
| 1344 | 450.00 | 6249.9 | 43450. | 6.9521 |
| 1343 | 450.00 | 6239.6 | 43450. | 6.9636 |
| 1249 | 450.00 | 6238.7 | 43450. | 6.9646 |
| 1342 | 450.00 | 6232.2 | 43450. | 6.9719 |
| 1250 | 450.00 | 5450.3 | 43450. | 7.9720 |
| 1251 | 450.00 | 5433.3 | 43450. | 7.9970 |
| 1341 | 450.00 | 5429.3 | 43450. | 8.0028 |
| 1340 | 450.00 | 5411.9 | 43450. | 8.0286 |
| 1252 | 450.00 | 5411.3 | 43450. | 8.0295 |
| 1339 | 450.00 | 5389.5 | 43450. | 8.0620 |
| 1253 | 450.00 | 5383.9 | 43450. | 8.0703 |
| 1338 | 450.00 | 5361.8 | 43450. | 8.1036 |
| 1254 | 450.00 | 5359.7 | 43450. | 8.1068 |
| 1255 | 450.00 | 5338.8 | 43450. | 8.1385 |
| 1337 | 450.00 | 5337.4 | 43450. | 8.1407 |
| 1256 | 450.00 | 5321.4 | 43450. | 8.1651 |
| 1336 | 450.00 | 5316.3 | 43450. | 8.1730 |
| 1257 | 450.00 | 5303.2 | 43450. | 8.1931 |
| 1335 | 450.00 | 5298.8 | 43450. | 8.2000 |
| 1258 | 450.00 | 5288.6 | 43450. | 8.2158 |
| 1334 | 450.00 | 5286.3 | 43450. | 8.2193 |
| 1259 | 450.00 | 5274.4 | 43450. | 8.2378 |
| 1333 | 450.00 | 5271.7 | 43450. | 8.2421 |
| 1332 | 450.00 | 5257.6 | 43450. | 8.2643 |
| 1260 | 450.00 | 3321.2 | 43450. | 13.083 |
| 1331 | 450.00 | 3298.6 | 43450. | 13.172 |
| 1261 | 450.00 | 3285.5 | 43450. | 13.225 |
| 1330 | 450.00 | 3263.0 | 43450. | 13.316 |
| 1262 | 450.00 | 3259.2 | 43450. | 13.331 |
| 1263 | 450.00 | 3242.7 | 43450. | 13.399 |

Table 7 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1329 | 450.00 | 3236.9 | 43450. | 13.423 |
| 1264 | 450.00 | 3236.0 | 43450. | 13.427 |
| 1328 | 450.00 | 3220.6 | 43450. | 13.491 |
| 1265 | 450.00 | 3219.4 | 43450. | 13.496 |
| 1327 | 450.00 | 3214.2 | 43450. | 13.518 |
| 1326 | 450.00 | 3198.0 | 43450. | 13.587 |
| 1266 | 450.00 | 3192.0 | 43450. | 13.612 |
| 1325 | 450.00 | 3171.0 | 43450. | 13.703 |
| 1267 | 450.00 | 3166.8 | 43450. | 13.720 |
| 1324 | 450.00 | 3160.3 | 43450. | 13.749 |
| 1286 | 450.00 | 2989.3 | 43450. | 14.535 |
| 1305 | 450.00 | 2986.3 | 43450. | 14.550 |
| 1288 | 450.00 | 2083.4 | 43450. | 20.855 |
| 1287 | 450.00 | 2082.6 | 43450. | 20.863 |
| 1303 | 450.00 | 2075.9 | 43450. | 20.931 |
| 1304 | 450.00 | 2073.9 | 43450. | 20.950 |
| 1289 | 450.00 | 2071.0 | 43450. | 20.981 |
| 1302 | 450.00 | 2064.5 | 43450. | 21.046 |
| 1294 | 450.00 | 2062.3 | 43450. | 21.069 |
| 1297 | 450.00 | 2061.7 | 43450. | 21.075 |
| 1293 | 450.00 | 2055.3 | 43450. | 21.140 |
| 1298 | 450.00 | 2053.5 | 43450. | 21.159 |
| 1290 | 450.00 | 2044.9 | 43450. | 21.248 |
| 1301 | 450.00 | 2039.6 | 43450. | 21.303 |
| 1295 | 450.00 | 2037.8 | 43450. | 21.322 |
| 1296 | 450.00 | 2037.6 | 43450. | 21.324 |
| 1292 | 450.00 | 2037.1 | 43450. | 21.330 |
| 1299 | 450.00 | 2034.0 | 43450. | 21.361 |
| 1291 | 450.00 | 2033.6 | 43450. | 21.366 |
| 1300 | 450.00 | 2029.4 | 43450. | 21.410 |
| 1268 | 450.00 | 1805.0 | 43450. | 24.072 |
| 1269 | 450.00 | 1798.6 | 43450. | 24.158 |
| 1323 | 450.00 | 1793.9 | 43450. | 24.221 |
| 1322 | 450.00 | 1787.6 | 43450. | 24.306 |
| 1270 | 450.00 | 1516.7 | 43450. | 28.647 |
| 1321 | 450.00 | 1499.2 | 43450. | 28.982 |
| 1271 | 450.00 | 1488.3 | 43450. | 29.195 |
| 1284 | 450.00 | 1476.5 | 43450. | 29.428 |
| 1274 | 450.00 | 1474.1 | 43450. | 29.475 |
| 1272 | 450.00 | 1471.6 | 43450. | 29.525 |
| 1320 | 450.00 | 1471.2 | 43450. | 29.533 |
| 1307 | 450.00 | 1470.9 | 43450. | 29.540 |
| 1273 | 450.00 | 1466.9 | 43450. | 29.621 |
| 1285 | 450.00 | 1463.4 | 43450. | 29.690 |
| 1317 | 450.00 | 1458.7 | 43450. | 29.788 |
| 1306 | 450.00 | 1458.1 | 43450. | 29.798 |
| 1319 | 450.00 | 1455.1 | 43450. | 29.861 |
| 1275 | 450.00 | 1455.1 | 43450. | 29.861 |
| 1318 | 450.00 | 1450.9 | 43450. | 29.948 |

Table 7 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1316 | 450.00 | 1440.2 | 43450. | 30.169 |
| 1278 | 450.00 | 1436.0 | 43450. | 30.259 |
| 1279 | 450.00 | 1429.3 | 43450. | 30.400 |
| 1313 | 450.00 | 1422.5 | 43450. | 30.545 |
| 1312 | 450.00 | 1416.5 | 43450. | 30.675 |
| 1280 | 450.00 | 1394.0 | 43450. | 31.168 |
| 1311 | 450.00 | 1382.0 | 43450. | 31.440 |
| 1281 | 450.00 | 1371.3 | 43450. | 31.685 |
| 1283 | 450.00 | 1363.6 | 43450. | 31.863 |
| 1282 | 450.00 | 1361.2 | 43450. | 31.921 |
| 1310 | 450.00 | 1360.0 | 43450. | 31.949 |
| 1276 | 450.00 | 1358.6 | 43450. | 31.980 |
| 1308 | 450.00 | 1353.8 | 43450. | 32.094 |
| 1309 | 450.00 | 1350.6 | 43450. | 32.171 |
| 1315 | 450.00 | 1350.3 | 43450. | 32.178 |
| 1277 | 450.00 | 1349.1 | 43450. | 32.207 |
| 1314 | 450.00 | 1340.9 | 43450. | 32.403 |

Table 8

```
TITLE=
MPC-24E Structural Analysis

SUBTITLE  1 =
Component: Enclosure Vessel
SUBTITLE  2 =
Load Combination: E2.b (See Table 2.1.7)
SUBTITLE  3 =
Stress Result: Primary Local Plus Primary Bending (PL+PB)

PRINT ELEMENT TABLE ITEMS PER ELEMENT
```

| STAT ELEM | CURRENT REF TEMP | MIXED PL+PB | PREVIOUS ALLOW | PREVIOUS SF |
|---|---|---|---|---|
| 1322 | 450.00 | 1.7124. | 65200. | 3.8076 |
| 1269 | 450.00 | 1.7124. | 65200. | 3.8076 |
| 1323 | 450.00 | 1.7119. | 65200. | 3.8086 |
| 1268 | 450.00 | 1.7119. | 65200. | 3.8086 |
| 1306 | 450.00 | 1.5131. | 65200. | 4.3091 |
| 1285 | 450.00 | 1.5131. | 65200. | 4.3091 |
| 1307 | 450.00 | 1.5123. | 65200. | 4.3113 |
| 1284 | 450.00 | 1.5123. | 65200. | 4.3113 |
| 1275 | 450.00 | 1.4442. | 65200. | 4.5148 |
| 1316 | 450.00 | 1.4442. | 65200. | 4.5148 |
| 1274 | 450.00 | 1.4438. | 65200. | 4.5159 |
| 1317 | 450.00 | 1.4438. | 65200. | 4.5159 |
| 1278 | 450.00 | 1.3961. | 65200. | 4.6703 |
| 1313 | 450.00 | 1.3961. | 65200. | 4.6703 |
| 1279 | 450.00 | 1.3954. | 65200. | 4.6726 |
| 1312 | 450.00 | 1.3954. | 65200. | 4.6726 |
| 1297 | 450.00 | 1.2589. | 65200. | 5.1793 |
| 1294 | 450.00 | 1.2589. | 65200. | 5.1793 |
| 1298 | 450.00 | 1.2580. | 65200. | 5.1829 |
| 1293 | 450.00 | 1.2580. | 65200. | 5.1829 |
| 1296 | 450.00 | 1.0978. | 65200. | 5.9389 |
| 1295 | 450.00 | 1.0978. | 65200. | 5.9389 |
| 1288 | 450.00 | 1.0871. | 65200. | 5.9979 |
| 1303 | 450.00 | 1.0871. | 65200. | 5.9979 |
| 1289 | 450.00 | 1.0866. | 65200. | 6.0006 |
| 1302 | 450.00 | 1.0866. | 65200. | 6.0006 |
| 1320 | 450.00 | 1.0820. | 65200. | 6.0257 |
| 1271 | 450.00 | 1.0820. | 65200. | 6.0257 |
| 1319 | 450.00 | 1.0820. | 65200. | 6.0259 |
| 1272 | 450.00 | 1.0820. | 65200. | 6.0259 |
| 1326 | 450.00 | 1.0256. | 65200. | 6.3573 |
| 1265 | 450.00 | 1.0256. | 65200. | 6.3573 |
| 1327 | 450.00 | 1.0251. | 65200. | 6.3606 |
| 1264 | 450.00 | 1.0251. | 65200. | 6.3606 |
| 1281 | 450.00 | 1.0244. | 65200. | 6.3647 |

Table 8 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1310 | 450.00 | 10244. | 65200. | 6.3647 |
| 1282 | 450.00 | 10243. | 65200. | 6.3655 |
| 1309 | 450.00 | 10243. | 65200. | 6.3655 |
| 1332 | 450.00 | 10008. | 65200. | 6.5149 |
| 1259 | 450.00 | 10008. | 65200. | 6.5149 |
| 1333 | 450.00 | 9222.2 | 65200. | 7.0699 |
| 1258 | 450.00 | 9222.2 | 65200. | 7.0699 |
| 1290 | 450.00 | 9188.8 | 65200. | 7.0956 |
| 1301 | 450.00 | 9188.8 | 65200. | 7.0956 |
| 1261 | 450.00 | 9183.6 | 65200. | 7.0996 |
| 1330 | 450.00 | 9183.6 | 65200. | 7.0996 |
| 1291 | 450.00 | 9182.8 | 65200. | 7.1002 |
| 1300 | 450.00 | 9182.8 | 65200. | 7.1002 |
| 1262 | 450.00 | 9179.9 | 65200. | 7.1025 |
| 1329 | 450.00 | 9179.9 | 65200. | 7.1025 |
| 1299 | 450.00 | 8848.0 | 65200. | 7.3689 |
| 1292 | 450.00 | 8848.0 | 65200. | 7.3689 |
| 1263 | 450.00 | 8752.8 | 65200. | 7.4491 |
| 1328 | 450.00 | 8752.8 | 65200. | 7.4491 |
| 1350 | 450.00 | 8651.2 | 65200. | 7.5365 |
| 1241 | 450.00 | 8651.2 | 65200. | 7.5365 |
| 1349 | 450.00 | 8651.1 | 65200. | 7.5367 |
| 1242 | 450.00 | 8651.1 | 65200. | 7.5367 |
| 1348 | 450.00 | 8635.8 | 65200. | 7.5500 |
| 1243 | 450.00 | 8635.8 | 65200. | 7.5500 |
| 1270 | 450.00 | 8635.2 | 65200. | 7.5505 |
| 1321 | 450.00 | 8635.2 | 65200. | 7.5505 |
| 1390 | 450.00 | 8533.6 | 65200. | 7.6404 |
| 1351 | 450.00 | 8533.6 | 65200. | 7.6404 |
| 1347 | 450.00 | 8461.9 | 65200. | 7.7052 |
| 1244 | 450.00 | 8461.9 | 65200. | 7.7052 |
| 1352 | 450.00 | 8414.4 | 65200. | 7.7487 |
| 1389 | 450.00 | 8414.4 | 65200. | 7.7487 |
| 1318 | 450.00 | 8349.7 | 65200. | 7.8087 |
| 1273 | 450.00 | 8349.7 | 65200. | 7.8087 |
| 1280 | 450.00 | 8286.5 | 65200. | 7.8682 |
| 1311 | 450.00 | 8286.5 | 65200. | 7.8682 |
| 1388 | 450.00 | 8263.6 | 65200. | 7.8900 |
| 1353 | 450.00 | 8263.6 | 65200. | 7.8900 |
| 1376 | 450.00 | 8157.6 | 65200. | 7.9926 |
| 1365 | 450.00 | 8157.6 | 65200. | 7.9926 |
| 1377 | 450.00 | 8157.5 | 65200. | 7.9926 |
| 1364 | 450.00 | 8157.5 | 65200. | 7.9926 |
| 1346 | 450.00 | 8103.0 | 65200. | 8.0464 |
| 1245 | 450.00 | 8103.0 | 65200. | 8.0464 |
| 1375 | 450.00 | 8102.8 | 65200. | 8.0466 |
| 1366 | 450.00 | 8102.8 | 65200. | 8.0466 |
| 1378 | 450.00 | 8075.7 | 65200. | 8.0736 |
| 1363 | 450.00 | 8075.7 | 65200. | 8.0736 |

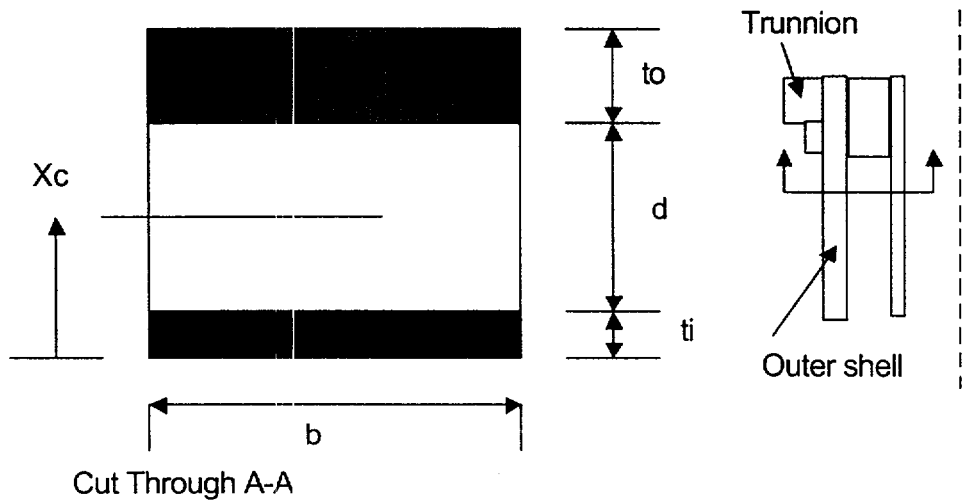
Table 8 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1331 | 450.00 | 8071.6 | 65200. | 8.0777 |
| 1260 | 450.00 | 8071.6 | 65200. | 8.0777 |
| 1340 | 450.00 | 8006.4 | 65200. | 8.1435 |
| 1251 | 450.00 | 8006.4 | 65200. | 8.1435 |
| 1339 | 450.00 | 8005.8 | 65200. | 8.1441 |
| 1252 | 450.00 | 8005.8 | 65200. | 8.1441 |
| 1387 | 450.00 | 7942.4 | 65200. | 8.2091 |
| 1354 | 450.00 | 7942.4 | 65200. | 8.2091 |
| 1374 | 450.00 | 7900.4 | 65200. | 8.2527 |
| 1367 | 450.00 | 7900.4 | 65200. | 8.2527 |
| 1379 | 450.00 | 7871.8 | 65200. | 8.2828 |
| 1362 | 450.00 | 7871.8 | 65200. | 8.2828 |
| 1257 | 450.00 | 7868.4 | 65200. | 8.2863 |
| 1334 | 450.00 | 7868.4 | 65200. | 8.2863 |
| 1386 | 450.00 | 7564.1 | 65200. | 8.6197 |
| 1355 | 450.00 | 7564.1 | 65200. | 8.6197 |
| 1361 | 450.00 | 7562.5 | 65200. | 8.6214 |
| 1380 | 450.00 | 7562.5 | 65200. | 8.6214 |
| 1373 | 450.00 | 7542.1 | 65200. | 8.6448 |
| 1368 | 450.00 | 7542.1 | 65200. | 8.6448 |
| 1345 | 450.00 | 7532.5 | 65200. | 8.6558 |
| 1246 | 450.00 | 7532.5 | 65200. | 8.6558 |
| 1360 | 450.00 | 7446.4 | 65200. | 8.7559 |
| 1381 | 450.00 | 7446.4 | 65200. | 8.7559 |
| 1336 | 450.00 | 7419.0 | 65200. | 8.7882 |
| 1255 | 450.00 | 7419.0 | 65200. | 8.7882 |
| 1337 | 450.00 | 7417.6 | 65200. | 8.7899 |
| 1254 | 450.00 | 7417.6 | 65200. | 8.7899 |
| 1256 | 450.00 | 7395.9 | 65200. | 8.8157 |
| 1335 | 450.00 | 7395.9 | 65200. | 8.8157 |
| 1283 | 450.00 | 7343.8 | 65200. | 8.8782 |
| 1308 | 450.00 | 7343.8 | 65200. | 8.8782 |
| 1253 | 450.00 | 7294.5 | 65200. | 8.9383 |
| 1338 | 450.00 | 7294.5 | 65200. | 8.9383 |
| 1359 | 450.00 | 7228.8 | 65200. | 9.0195 |
| 1382 | 450.00 | 7228.8 | 65200. | 9.0195 |
| 1371 | 450.00 | 7185.1 | 65200. | 9.0743 |
| 1370 | 450.00 | 7185.1 | 65200. | 9.0743 |
| 1286 | 450.00 | 7170.2 | 65200. | 9.0931 |
| 1305 | 450.00 | 7170.2 | 65200. | 9.0931 |
| 1372 | 450.00 | 7153.3 | 65200. | 9.1147 |
| 1369 | 450.00 | 7153.3 | 65200. | 9.1147 |
| 1385 | 450.00 | 7150.5 | 65200. | 9.1182 |
| 1356 | 450.00 | 7150.5 | 65200. | 9.1182 |
| 1383 | 450.00 | 6991.3 | 65200. | 9.3259 |
| 1358 | 450.00 | 6991.3 | 65200. | 9.3259 |
| 1249 | 450.00 | 6888.3 | 65200. | 9.4654 |
| 1342 | 450.00 | 6888.3 | 65200. | 9.4654 |
| 1344 | 450.00 | 6722.7 | 65200. | 9.6985 |

Table 8 (continued)

| ELEM | REF TEMP | PM | ALLOW | SF |
|---|---|---|---|---|
| 1247 | 450.00 | 6722.7 | 65200. | 9.6985 |
| 1384 | 450.00 | 6722.6 | 65200. | 9.6986 |
| 1357 | 450.00 | 6722.6 | 65200. | 9.6986 |
| 1314 | 450.00 | 6492.5 | 65200. | 10.042 |
| 1277 | 450.00 | 6492.5 | 65200. | 10.042 |
| 1248 | 450.00 | 6406.5 | 65200. | 10.177 |
| 1343 | 450.00 | 6406.5 | 65200. | 10.177 |
| 1250 | 450.00 | 6106.4 | 65200. | 10.677 |
| 1341 | 450.00 | 6106.4 | 65200. | 10.677 |
| 1266 | 450.00 | 5768.2 | 65200. | 11.303 |
| 1325 | 450.00 | 5768.2 | 65200. | 11.303 |
| 1267 | 450.00 | 5315.1 | 65200. | 12.267 |
| 1324 | 450.00 | 5315.1 | 65200. | 12.267 |
| 1315 | 450.00 | 5244.3 | 65200. | 12.432 |
| 1276 | 450.00 | 5244.3 | 65200. | 12.432 |
| 1304 | 450.00 | 4272.7 | 65200. | 15.260 |
| 1287 | 450.00 | 4272.7 | 65200. | 15.260 |

This calculation determines the centroid location and moment of inertia, relative to the inside edge of the inner cylinder of the transfer cask. The result is needed so that the interface stress in the HI-TRAC 100 can be estimated from the finite element results for the HI-TRAC 125.




HI-TRAC 125 Dwg. 1880, Sheet 2

$b := 10 \cdot in$ $ti := 0.75 \cdot in$ $to := 1.0 \cdot in$ $d := 4.5 \cdot in$

$A_o := b \cdot to$ $A_o = 10\,in^2$ $A_i := b \cdot ti$ $A_i = 7.5\,in^2$

$$Xc := \frac{A_o \cdot (ti + d + .5 \cdot to) + A_i \cdot (.5 \cdot ti)}{A_o + A_i}$$ $Xc = 3.446\,in$

$C := (ti + to + d) - Xc$ $C = 2.804\,in$ $c_{125} := C$

$$I := A_i \cdot (Xc - .5 \cdot ti)^2 + A_o \cdot (C - .5 \cdot to)^2 + \frac{b}{12} \cdot \left(ti^3 + to^3\right)$$

$C_{125} := Xc$ $r_{125} := \frac{I}{C}$ $r_{125} = 44.587\,in^3$ $I = 125.002\,in^4$

HI-TRAC 100 Dwg. 2145, Sheet 2

$ti := 0.75 \cdot in$ $to := 1.0 \cdot in$ $d := 2.875 \cdot in$

$A_o := b \cdot to$ $A_o = 10\,in^2$ $A_i := b \cdot ti$ $A_i = 7.5\,in^2$

$$Xc := \frac{A_o \cdot (ti + d + .5 \cdot to) + A_i \cdot (.5 \cdot ti)}{A_o + A_i} \qquad Xc = 2.518\,in$$

$C := (ti + to + d) - Xc$ $C = 2.107\,in$ $c_{100} := C$

$$I := A_i \cdot (Xc - .5 \cdot ti)^2 + A_o \cdot (C - .5 \cdot to)^2 + \frac{b}{12} \cdot \left(ti^3 + to^3\right) \qquad I = 61.453\,in^4$$

$C_{100} := Xc$ $r_{100} := \frac{I}{C}$ $r_{100} = 29.164\,in^3$

Calculate $X := \frac{r_{125}}{r_{100}}$ $X = 1.529$

Calculate Moment arms

$ID := 68.75 \cdot in$ $w := 2.5 \cdot in$ Lift Yoke contact width

$OD := 90 \cdot in$ Outer edge of trunnion to match with HI-STAR 100

$Span := .5 \cdot (OD - ID)$ $Span = 10.625\,in$

$arm_{125} := Span - .5 \cdot w - C_{125}$ $arm_{125} = 5.929\,in$

$arm_{100} := Span - .5 \cdot w - C_{100}$ $arm_{100} = 6.857\,in$

$F_{125} := 125000 \cdot lbf$ $F_{100} := 100500 \cdot lbf$

$M_{125} := F_{125} \cdot arm_{125}$ $M_{125} = 7.411 \times 10^5\,lbf \cdot in$

$M_{100} := F_{100} \cdot arm_{100}$ $M_{100} = 6.891 \times 10^5\,lbf \cdot in$

$$\sigma_{125} := \frac{F_{125} \cdot arm_{125}}{r_{125}} + \frac{F_{125}}{A_o + A_i} \qquad \sigma_{100} := \frac{F_{100} \cdot arm_{100}}{r_{100}} + \frac{F_{100}}{A_o + A_i} \qquad \frac{\sigma_{100}}{\sigma_{125}} = 1.236$$

MISCELLANEOUS CALCULATIONS FOR CHAPTER 3, REV 11

D2.1 Introduction

This Calculation contains results of individual calculations that appear directly in the text of chapter 3 of the TSAR. The purpose of this Calculation is simply to provide a location in the backup calculation package of items in the text. The calculations are identified by section; references, assumptions, if needed, are in the text, and are not repeated here. No descriptive text is given here. The calculations are updated to support Rev. 11 of the TSAR document.

D2.2 Section 3.4.6 - Calculation of flood water effects

$W := 303000 \cdot lbf$ $\quad$ $Diameter := 132.5 \cdot in$ $\quad$ $g = 32.174\, ft\, sec^{-2}$

$H := 231.25 \cdot in$ $\quad$ $\gamma := 62.4 \cdot \frac{lbf}{ft^3}$ $\quad$ Drg. 1495 has dimensions

$A := H \cdot Diameter$ $\quad$ $A = 212.782\, ft^2$

The force resisting sliding is the coefficient of friction multiplied by the vertical load on the pad. For a conservative (low) estimate of the sliding velocity limit, a minimum sliding force needs to be computed. Therefore, we compute the bouyant force existing for a fully submerged cask, recognizing that there will be water inside the overpack in the annular space.

We need to compute the total volume of the cask so as to compute the weight of water displaced. We compute this volume by considering the cask as a solid cylinder and then subtracting out the annular spaces and channels that will be filled with water during submergence.

$Total_Volume := \frac{\pi}{4} \cdot Diameter^2 \cdot H$ $\quad$ $Total_Volume = 3.189 \times 10^6 in^3$

The Inner diameter of the overpack is( see Drg. 1495,sheet 2) $\quad ID := 73.5 \cdot in$

The outer diameter of the HI-STAR MPC is (Drg. 1402) $\quad OD := 68.375 \cdot in$

An approximate calculation of the water volume in the annulus is simply

$Volume_{annulus} := \frac{\pi}{4} \cdot \left(ID^2 - OD^2\right) \cdot H$ $\quad$ $Volume_{annulus} = 1.321 \times 10^5 in^3$

This calculation neglects the "c" channels which will subtract off a minor amount of water volume.

The water volume in the inlet and outlet cutouts (see Drg. 1495, 1496 for dimensions) is computed approximately as follows:

Outlets (4 total at top)

$$Volume_{top} := 4 \cdot 25 \cdot in \cdot 6 \cdot in \cdot \frac{(Diameter - ID)}{2} \qquad Volume_{top} = 1.77 \times 10^4 in^3$$

Inlets (4 total at bottom)

$$Volume_{bottom} := 4 \cdot 15 \cdot in \cdot 10 \cdot in \cdot \frac{(Diameter - ID)}{2}$$

$$Volume_{bottom} = 1.77 \times 10^4 in^3$$

Therefore, the displaced volume is approximately computed as

$$Volume_{displaced} := Total_Volume - Volume_{annulus} - Volume_{top} \ldots + -Volume_{bottom}$$

$$Volume_{displaced} = 3.021 \times 10^6 in^3$$

We now compute the ratio of wet weight to dry weight, K

$$K := 1 - \frac{\gamma \cdot Volume_{displaced}}{W} \qquad K = 0.64$$

The coefficient for friction is conservatively set at a low value of 0.25. Data for steel on steel in water indicates a lower bound on coefficient of friction equal to 0.2 (E. Rabinowicz, "Friction Coefficients of Water Lubricated Stainless Steels for a Spent Fuel Rack Facility, MIT, 1976, (a report for Boston Edison Company)). .It is conservative to use a value higher than that for wet steel on steel

$$\mu := 0.25$$

$$F_{slide} := \mu \cdot K \cdot W \qquad F_{slide} = 4.8476 \times 10^4 lbf$$

$$Value := \frac{2 \cdot g \cdot F_{slide}}{A \cdot \gamma} \qquad Velocity := \sqrt{Value} \qquad Velocity = 15.327 \frac{ft}{sec}$$

For the static stability calculation, the centroid location is conservatively set at the highest location (defined as $H_{asterisk}$):

$$H_{asterisk} := 118.51 \cdot in$$ Table 3.2.3

$$F_T := \frac{K \cdot Diameter}{2 \cdot H_{asterisk}} \cdot W \qquad F_T = 1.08396 \times 10^5 lbf$$

Note that what is being computed here is the force required to just initiate a rotational motion to tip the cask.

D2.3 Calculations Supporting Section 3.4.7

From Table 3.2.1 (Note that Loaded weights are used).

$W_{ovp} := 265866 \cdot lbf$ $\quad H_{ovp} := 116.8 \cdot in$ Tables 3.2.1 and 3.2.3

$W_{mpc24} := 39667 \cdot lbf$ $\quad h_{mpc24} := 108.9 \cdot in$

$W_{mpc32} := 34375 \cdot lbf$ $\quad h_{mpc32} := 109.3 \cdot in$

$W_{mpc68} := 39641 \cdot lbf$ $\quad h_{mpc68} := 109.9 \cdot in$

$W_{mpc24e} := 42069 \cdot lbf$ $\quad h_{mpc24e} := 107.9 \cdot in$

$h_{ped} := 22 \cdot in$ height of concrete pedestal

$h_{plate} := 2 \cdot in$ thickness of overpack bottom plate

The composite centroid is obtained from the equation

$$H_{cg24} := \frac{W_{ovp} \cdot H_{ovp} + W_{mpc24} \cdot (h_{mpc24} + h_{ped} + h_{plate})}{W_{ovp} + W_{mpc24}}$$

$H_{cg24} = 118.89\,in$

$$H_{cg32} := \frac{W_{ovp} \cdot H_{ovp} + W_{mpc32} \cdot (h_{mpc32} + h_{ped} + h_{plate})}{W_{ovp} + W_{mpc32}}$$

$H_{cg32} = 118.689\,in$

$$H_{cg68} := \frac{W_{ovp} \cdot H_{ovp} + W_{mpc68} \cdot (h_{mpc68} + h_{ped} + h_{plate})}{W_{ovp} + W_{mpc68}}$$

$H_{cg68} = 119.019\,in$

$$H_{cg24e} := \frac{W_{ovp} \cdot H_{ovp} + W_{mpc24e} \cdot (h_{mpc24e} + h_{ped} + h_{plate})}{W_{ovp} + W_{mpc24e}}$$

$H_{cg24e} = 118.863\,in$

For the limiting G value calculation $r := 66.25 \cdot in$ $H := H_{cg68}$

The vertical acceleration multiplier is (net from 2 equal horizontal inputs)

$G_v := 0.16$ $G_{max} := \frac{r}{H} \cdot (1 - G_v)$ $G_{max} = 0.468$

$G_v := 0.2$ $G_{max} := \frac{r}{H} \cdot (1 - G_v)$ $G_{max} = 0.445$

$G_v := 0.25$ $G_{max} := \frac{r}{H} \cdot (1 - G_v)$ $G_{max} = 0.417$

$G_v := .357$ $G_{max} := \frac{r}{H} \cdot (1 - G_v)$ $G_{max} = 0.358$

From Table 3.2.1 (Note that empty weights are used for conservatism since the results for the centroid will be the largest).

| | | |
|---|---|---|
| $W_{ovp} := 252337 \cdot lbf$ | $H_{ovp} := 111.3 \cdot in$ | Tables 3.2.1 and 3.2.3 |
| $W_{mpc24} := 39667 \cdot lbf$ | $h_{mpc24} := 108.9 \cdot in$ | |
| $W_{mpc32} := 34375 \cdot lbf$ | $h_{mpc32} := 109.3 \cdot in$ | |
| $W_{mpc68} := 39641 \cdot lbf$ | $h_{mpc68} := 109.9 \cdot in$ | |
| $W_{mpc24e} := 42069 \cdot lbf$ | $h_{mpc24e} := 107.9 \cdot in$ | |
| | $h_{ped} := 17 \cdot in$ | height of concrete pedestal(reduced in 100S |
| | $h_{plate} := 2 \cdot in$ | thickness of overpack bottom plate |

The composite centroid is obtained from the equation

$$H_{cg24} := \frac{W_{ovp} \cdot H_{ovp} + W_{mpc24} \cdot (h_{mpc24} + h_{ped} + h_{plate})}{W_{ovp} + W_{mpc24}}$$

$H_{cg24} = 113.555\,in$

$$H_{cg32} := \frac{W_{ovp} \cdot H_{ovp} + W_{mpc32} \cdot (h_{mpc32} + h_{ped} + h_{plate})}{W_{ovp} + W_{mpc32}}$$

$H_{cg32} = 113.338\,in$

$$H_{cg68} := \frac{W_{ovp} \cdot H_{ovp} + W_{mpc68} \cdot (h_{mpc68} + h_{ped} + h_{plate})}{W_{ovp} + W_{mpc68}}$$

$H_{cg68} = 113.69\,in$

$$H_{cg24e} := \frac{W_{ovp} \cdot H_{ovp} + W_{mpc24e} \cdot (h_{mpc24e} + h_{ped} + h_{plate})}{W_{ovp} + W_{mpc24e}}$$

$H_{cg24e} = 113.529\,in$

For the limiting G value calculation $r := 66.25 \cdot in$ $H := H_{cg68}$

The vertical acceleration multiplier is

$G_v := 0.16$ $G_{max} := \frac{r}{H} \cdot (1 - G_v)$ $G_{max} = 0.489$

$G_v := 0.2$ $G_{max} := \frac{r}{H} \cdot (1 - G_v)$ $G_{max} = 0.466$

$G_v := 0.25$ $G_{max} := \frac{r}{H} \cdot (1 - G_v)$ $G_{max} = 0.437$

$G_v := .368$ $G_{max} := \frac{r}{H} \cdot (1 - G_v)$ $G_{max} = 0.368$

D2.4 Calculations in Support of Section 3.4.8.1.b

Determine denting of overpack top lid

$KE := 1.755 \cdot 10^6 \cdot lbf \cdot in$ $S_u := 69400 \cdot psi$ $D := 8 \cdot in$

The dent is based on a shear plug failure where the lid is assumed globally rigid and the object "drills" a hole into the lid with all of the energy absorbed by shearing action. The limit shear stress is assumed to be 50% of the ultimate strength in tension.

$$Dent := \sqrt{\frac{2 \cdot KE}{\pi \cdot D \cdot S_u}} \qquad Dent = 1.419\,in$$

D2.5 Calculations in Support of Appendix 3.A

In this computation, the initial angular velocity of the cask is computed from basic rigid bogy mechanics. Input data is listed in Appendix 3.A, Table 3.A.3.

Compute the Cask Moment of inertia. Consider the mass distribution as uniform over the length. The mass moment of inertia is computed as a hollow cylinder having an effective mass equal to the total mass of the loaded HI-STORM 100. All formulas used are derived in the Appendix 3.A. Here, we use the formulas without further explaination.

$W_{total} := 356521 \cdot lbf$ We use a representative weight.

Note that the calculation of angular speed at impact will be independent of the weight. This is because, the angular speed is proportional to the ratio of weight to mass moment of inertia. Since the mass moment of inertia is linearly proportional to the weight, the effect dissapears. Therefore, although a value for weight must be input in order to evaluate the individual quantities, the result for angular velocity at impact are independent of the weight input into this calculation.

$h := 118.5 \cdot in$ $L := 231.5 \cdot in$

$d := 132.5 \cdot in$ $d_i := 72.5 \cdot in$

$$r := \sqrt{\frac{d^2}{4} + (h)^2} \qquad r = 66.25\,in$$

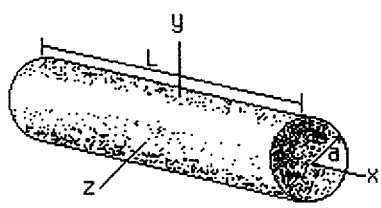
The effective mass density is computed below

$$Volume := \frac{\pi}{4}\cdot\left(d^2 - d_i^2\right)\cdot(2\cdot h) \qquad Volume = 2.29\times 10^6\,in^3$$

$$\rho_{eff} := \frac{W_{total}}{Volume\cdot g} \qquad \rho_{eff} = 4.033\times 10^{-4}\,lbf\cdot\frac{sec^2}{in^4}$$

We compute the mass moment of inertia by subtracting the results obtained for two solid cylinders.

Determine the mass moment of inertia, *I*, of a circular cylinder about the *x*-, *y*-, and *z*-axes, as shown, given the length, *L*, and radius, *a*, of the cylinder, and its mass.




Using the outside dimension

$$L = 231.5\,in \qquad a := \frac{d}{2}$$

$$mass := \rho_{eff}\cdot\pi\cdot a^2\cdot L$$

$$I_{yo} := \frac{1}{12}\cdot mass\cdot\left(3\cdot a^2 + L^2\right)$$ Moment about *y*

$$I_{zo} := I_{yo}$$ Moment about *z*

$$I_{yo} = 7.162\times 10^6\,lbf\cdot in\cdot sec^2 \qquad I_{zo} = 7.162\times 10^6\,lbf\cdot in\cdot sec^2$$

Using the inside dimension

$$L = 231.5\,in \qquad a := \frac{d_i}{2} \qquad mass := \rho_{eff}\cdot\pi\cdot a^2\cdot L$$

$$I_{yi} := \frac{1}{12} \cdot mass \cdot \left(3 \cdot a^2 + L^2\right)$$ Moment about $y$

$$I_{zi} := I_{yi}$$ Moment about $z$

$$I_{yi} = 1.848 \times 10^6 \, lbf \cdot in \cdot sec^2 \qquad I_{zi} = 1.848 \times 10^6 \, lbf \cdot in \cdot sec^2$$

The moment of inertia of the hollow cylinder about its centroid is

$$I_z := I_{zo} - I_{zi} \qquad I_z = 5.314 \times 10^6 \, lbf \cdot in \cdot sec^2$$

The moment of inertia about the lower pivot point A (Fig. 3.A.16 in TSAR) is

$$I_A := I_z + \frac{W_{total}}{g} \cdot r^2 \qquad I_A = 2.233 \times 10^7 \, lbf \cdot in \cdot sec^2$$

Find the angle $\theta$ per equation 3.A.12

$$\theta := acos\left(\frac{d}{2 \cdot r}\right) \qquad \theta = 60.792 \, deg$$

$$\cos(\theta) = 0.488$$

Then the initial angular velocity for the tipover calculation is

$$\omega := \sqrt{\frac{2 \cdot W_{total} \cdot r}{I_A} \cdot \left(1 - \frac{d}{2 \cdot r}\right)} \qquad \omega = 1.49 \, sec^{-1}$$