

50-305

RESPONSE TO NUREG-0737 ITEM II.D.1

Docket # *50-305*

Control # *8403280048*

Date *3/23/84* of Document:  
REGULATORY DOCKET FILE

|       |       |       |        |       |       |       |        |       |       |       |        |        |       |
|-------|-------|-------|--------|-------|-------|-------|--------|-------|-------|-------|--------|--------|-------|
| .3810 | 1639. | -257. | -1657. | -624. | 5412. | -221. | .0046  | .0028 | .0060 | .0362 | -.0613 | -.0140 | 2188. |
| .3820 | 2209. | -69.  | -1599. | -712. | 5116. | 157.  | .0036  | .0027 | .0055 | .0342 | -.0558 | -.0135 | 2074. |
| .3830 | 2710. | 42.   | -1441. | -792. | 4786. | 506.  | .0025  | .0025 | .0049 | .0319 | -.0500 | -.0126 | 1957. |
| .3840 | 3132. | 90.   | -1203. | -861. | 4432. | 820.  | .0015  | .0023 | .0043 | .0294 | -.0438 | -.0115 | 1841. |
| .3850 | 3418. | 171.  | -993.  | -918. | 4065. | 1094. | .0007  | .0021 | .0038 | .0267 | -.0383 | -.0109 | 1729. |
| .3860 | 3529. | 318.  | -856.  | -959. | 3694. | 1320. | .0003  | .0018 | .0033 | .0239 | -.0339 | -.0111 | 1621. |
| .3870 | 3515. | 449.  | -720.  | -982. | 3326. | 1486. | -.0000 | .0015 | .0028 | .0211 | -.0300 | -.0115 | 1514. |
| .3880 | 3474. | 475.  | -505.  | -986. | 2969. | 1584. | -.0004 | .0012 | .0023 | .0184 | -.0257 | -.0109 | 1407. |
| .3890 | 3455. | 422.  | -249.  | -967. | 2638. | 1617. | -.0009 | .0010 | .0018 | .0159 | -.0210 | -.0094 | 1301. |
| .3900 | 3441. | 388.  | -52.   | -926. | 2343. | 1592. | -.0014 | .0009 | .0014 | .0135 | -.0166 | -.0075 | 1196. |
| .3910 | 3427. | 409.  | 48.    | -861. | 2092. | 1511. | -.0019 | .0007 | .0010 | .0113 | -.0127 | -.0055 | 1092. |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.00.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKM24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 48    | MEMBER | 1    | SEQUENCE | 823     | LOCATION | END    | TYPE  | EL     | DX    | DY     | DZ     | RX    | RY    | RZ    | STRESS |
|---------|-------|--------|------|----------|---------|----------|--------|-------|--------|-------|--------|--------|-------|-------|-------|--------|
| TIME    | FX    | FY     | FZ   | MX       | MY      | MZ       |        |       |        | (IN)  | (IN)   | (IN)   | (DEG) | (DEG) | (DEG) | (PSI)  |
| (SEC)   | (LB)  | (LB)   | (LB) | (FT-LB)  | (FT-LB) | (FT-LB)  |        |       |        |       |        |        |       |       |       |        |
| .3920   | 3476. | 416.   | 121. | -774.    | 1688.   | 1373.    | -.0025 | .0007 | .0006  | .0093 | -.0087 | -.0026 | 987.  |       |       |        |
| .3930   | 3661. | 324.   | 245. | -668.    | 1735.   | 1174.    | -.0035 | .0007 | .0002  | .0076 | -.0038 | .0019  | 883.  |       |       |        |
| .3940   | 3968. | 153.   | 389. | -546.    | 1637.   | 921.     | -.0047 | .0009 | -.0003 | .0064 | .0018  | .0077  | 785.  |       |       |        |
| .3950   | 4317. | -8.    | 459. | -409.    | 1595.   | 618.     | -.0060 | .0012 | -.0006 | .0056 | .0069  | .0140  | 706.  |       |       |        |
| .3960   | 4651. | -119.  | 417. | -260.    | 1610.   | 271.     | -.0072 | .0015 | -.0008 | .0053 | .0112  | .0202  | 663.  |       |       |        |
| .3970   | 4979. | -243.  | 345. | -100.    | 1675.   | -120.    | -.0083 | .0019 | -.0010 | .0053 | .0149  | .0265  | 675.  |       |       |        |
| .3980   | 5307. | -453.  | 337. | 68.      | 1783.   | -557.    | -.0095 | .0023 | -.0011 | .0056 | .0187  | .0335  | 750.  |       |       |        |
| .3990   | 5573. | -720.  | 373. | 240.     | 1927.   | -1033.   | -.0106 | .0028 | -.0012 | .0061 | .0220  | .0405  | 883.  |       |       |        |
| .4000   | 5684. | -948.  | 360. | 409.     | 2102.   | -1533.   | -.0114 | .0032 | -.0012 | .0069 | .0237  | .0465  | 1057. |       |       |        |

MAXIMUM VALUE OF STRESS OCCURS AT

| TIME  | FX    | FY    | FZ    | MX      | MY      | MZ      | DX     | DY     | DZ     | RX     | RY    | RZ     | STRESS |
|-------|-------|-------|-------|---------|---------|---------|--------|--------|--------|--------|-------|--------|--------|
| (SEC) | (LB)  | (LB)  | (LB)  | (FT-LB) | (FT-LB) | (FT-LB) | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG) | (DEG)  | (PSI)  |
| .3140 | 3761. | 1677. | 1089. | -664.   | -5907.  | 5120.   | -.0089 | -.0033 | -.0066 | -.0364 | .0725 | -.0074 | 3148.  |

| SECTION | 48   | MEMBER | 2    | SEQUENCE | 67      | LOCATION | END    | TYPE   | EL     | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |
|---------|------|--------|------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| TIME    | FX   | FY     | FZ   | MX       | MY      | MZ       |        |        |        | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |
| (SEC)   | (LB) | (LB)   | (LB) | (FT-LB)  | (FT-LB) | (FT-LB)  |        |        |        |        |        |        |        |        |        |        |
| 0.0000  | 0.   | 0.     | 0.   | 0.       | 0.      | 0.       | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.     |
| .0010   | 0.   | -0.    | 0.   | -0.      | -0.     | -0.      | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 0.     |
| .0020   | 1.   | -0.    | 0.   | -0.      | -0.     | -1.      | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 0.     |
| .0030   | 2.   | -1.    | 0.   | -0.      | -0.     | -2.      | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 1.     |
| .0040   | 4.   | -1.    | 1.   | -0.      | -3.     | -3.      | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 2.     |
| .0050   | 7.   | -1.    | 0.   | -0.      | -5.     | -4.      | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 3.     |
| .0060   | 11.  | -1.    | -0.  | -1.      | -7.     | -6.      | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 4.     |
| .0070   | 15.  | 0.     | -1.  | -1.      | -9.     | -8.      | -.0000 | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 5.     |
| .0080   | 15.  | 2.     | -3.  | -0.      | -8.     | -7.      | -.0000 | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 4.     |
| .0090   | 11.  | 4.     | -5.  | 1.       | -5.     | -5.      | -.0000 | -.0000 | .0000  | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 3.     |
| .0100   | 6.   | 4.     | -3.  | 1.       | -3.     | -2.      | -.0000 | -.0000 | -.0000 | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 2.     |
| .0110   | 2.   | 1.     | 2.   | 1.       | -2.     | -1.      | -.0000 | -.0000 | -.0000 | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 1.     |
| .0120   | -2.  | -2.    | 5.   | -1.      | -1.     | 0.       | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 1.     |
| .0130   | -8.  | -3.    | 5.   | -5.      | 2.      | 4.       | .0000  | .0000  | -.0000 | .0000  | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 3.     |
| .0140   | -14. | -2.    | 2.   | -10.     | 6.      | 9.       | .0000  | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 6.     |
| .0150   | -16. | -2.    | 0.   | -15.     | 7.      | 11.      | .0000  | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 8.     |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.00.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKM24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |      |     |     |      |     |     |        |        |        |        |        |        |        |    |
|-------|------|-----|-----|------|-----|-----|--------|--------|--------|--------|--------|--------|--------|----|
| .0050 | 7.   | -1. | 0.  | -0.  | -5. | -4. | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 2. |
| .0069 | 11.  | -1. | -0. | -1.  | -7. | -6. | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 3. |
| .0070 | 15.  | 0.  | -1. | -1.  | -9. | -8. | -.0000 | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 4. |
| .0080 | 15.  | 2.  | -0. | -0.  | -8. | -7. | -.0000 | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 4. |
| .0090 | 11.  | 4.  | -0. | 1.   | -5. | -5. | -.0000 | -.0000 | .0000  | -.0000 | .0000  | .0000  | .0000  | 3. |
| .0100 | 6.   | 4.  | -3. | 1.   | -3. | -2. | -.0000 | -.0000 | -.0000 | -.0000 | .0000  | .0000  | .0000  | 2. |
| .0110 | 2.   | 1.  | 2.  | 1.   | -2. | -1. | -.0000 | -.0000 | -.0000 | -.0000 | .0000  | .0000  | .0000  | 1. |
| .0120 | -2.  | -2. | 5.  | -1.  | -1. | 0.  | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | -.0000 | 1. |
| .0130 | -8.  | -3. | 5.  | -5.  | 2.  | 4.  | .0000  | .0000  | -.0000 | .0000  | -.0000 | -.0000 | -.0000 | 3. |
| .0140 | -14. | -2. | 2.  | -10. | 6.  | 9.  | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | -.0000 | 6. |
| .0150 | -16. | -2. | 0.  | -15. | 7.  | 11. | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | -.0000 | 8. |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 48    | MEMBER | 2     | SEQUENCE | 67      | LOCATION | END | TYPE   | EL     |        |        |        |        |        |  |
|---------|-------|--------|-------|----------|---------|----------|-----|--------|--------|--------|--------|--------|--------|--------|--|
| TIME    | FX    | FY     | FZ    | MX       | MY      | MZ       |     | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |
| (SEC)   | (LB)  | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  |     | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |
| .0160   | -10.  | -6.    | 3.    | -20.     | 2.      | 9.       |     | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | 9.     |  |
| .0170   | 1.    | -9.    | 6.    | -23.     | -7.     | 3.       |     | -.0000 | .0000  | .0000  | .0000  | .0000  | -.0000 | 10.    |  |
| .0180   | 13.   | -9.    | 7.    | -26.     | -15.    | -2.      |     | -.0000 | .0000  | .0000  | .0001  | .0000  | .0000  | 12.    |  |
| .0190   | 25.   | -5.    | 2.    | -30.     | -20.    | -4.      |     | -.0000 | .0000  | .0000  | .0001  | .0001  | .0000  | 14.    |  |
| .0200   | 37.   | 2.     | -6.   | -34.     | -24.    | -6.      |     | -.0000 | .0000  | .0000  | .0001  | .0001  | .0000  | 17.    |  |
| .0210   | 51.   | 5.     | -11.  | -40.     | -32.    | -10.     |     | -.0000 | .0000  | .0000  | .0001  | .0001  | .0000  | 21.    |  |
| .0220   | 62.   | 2.     | -8.   | -48.     | -41.    | -13.     |     | -.0000 | .0000  | .0000  | .0001  | .0001  | .0001  | 26.    |  |
| .0230   | 62.   | -1.    | -5.   | -57.     | -44.    | -11.     |     | -.0000 | .0000  | .0000  | .0001  | .0001  | .0001  | 29.    |  |
| .0240   | 49.   | -5.    | -6.   | -65.     | -38.    | -3.      |     | -.0000 | .0000  | .0000  | .0001  | .0001  | .0000  | 30.    |  |
| .0250   | 31.   | -6.    | -12.  | -67.     | -24.    | 5.       |     | -.0000 | .0000  | .0000  | .0001  | .0001  | .0000  | 29.    |  |
| .0260   | 16.   | 1.     | -17.  | -60.     | -12.    | 14.      |     | -.0000 | .0000  | .0000  | .0001  | .0000  | -.0000 | 25.    |  |
| .0270   | -2.   | 8.     | -6.   | -47.     | -5.     | 26.      |     | .0000  | .0000  | .0000  | .0001  | .0000  | -.0001 | 22.    |  |
| .0280   | -29.  | 4.     | 17.   | -34.     | 1.      | 37.      |     | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0001 | 20.    |  |
| .0290   | -56.  | -2.    | 23.   | -26.     | 16.     | 45.      |     | .0000  | .0000  | -.0000 | .0000  | -.0001 | -.0001 | 22.    |  |
| .0300   | -93.  | -5.    | 18.   | -24.     | 40.     | 59.      |     | .0000  | .0000  | -.0000 | .0000  | -.0001 | -.0002 | 30.    |  |
| .0310   | -153. | -20.   | 32.   | -23.     | 66.     | 83.      |     | .0001  | .0000  | -.0000 | .0000  | -.0002 | -.0003 | 44.    |  |
| .0320   | -209. | -24.   | 36.   | -15.     | 95.     | 108.     |     | .0001  | .0000  | -.0000 | .0000  | -.0003 | -.0004 | 58.    |  |
| .0330   | -225. | -2.    | 16.   | 4.       | 113.    | 119.     |     | .0001  | .0000  | -.0000 | -.0000 | -.0004 | -.0004 | 66.    |  |
| .0340   | -205. | 6.     | 22.   | 34.      | 101.    | 105.     |     | .0001  | -.0000 | -.0000 | -.0001 | -.0003 | -.0003 | 60.    |  |
| .0350   | -198. | -27.   | 76.   | 72.      | 77.     | 77.      |     | .0001  | -.0000 | -.0000 | -.0002 | -.0003 | -.0003 | 52.    |  |
| .0360   | -235. | -47.   | 114.  | 110.     | 85.     | 76.      |     | .0001  | -.0000 | -.0000 | -.0003 | -.0003 | -.0003 | 64.    |  |
| .0370   | -290. | -2.    | 82.   | 141.     | 129.    | 115.     |     | .0001  | -.0000 | -.0000 | -.0003 | -.0005 | -.0004 | 89.    |  |
| .0380   | -306. | 54.    | 33.   | 158.     | 155.    | 141.     |     | .0001  | -.0000 | -.0000 | -.0004 | -.0005 | -.0005 | 105.   |  |
| .0390   | -256. | 29.    | 46.   | 160.     | 121.    | 99.      |     | .0001  | -.0000 | -.0000 | -.0004 | -.0004 | -.0004 | 90.    |  |
| .0400   | -182. | -56.   | 98.   | 155.     | 62.     | 14.      |     | .0001  | -.0000 | -.0000 | -.0003 | -.0003 | -.0001 | 67.    |  |
| .0410   | -149. | -92.   | 109.  | 158.     | 45.     | -29.     |     | .0001  | -.0000 | -.0000 | -.0003 | -.0002 | -.0000 | 67.    |  |
| .0420   | -176. | -41.   | 56.   | 181.     | 85.     | -4.      |     | .0001  | -.0000 | -.0000 | -.0004 | -.0003 | -.0001 | 80.    |  |
| .0430   | -207. | 18.    | 18.   | 217.     | 122.    | 27.      |     | .0001  | -.0000 | -.0000 | -.0004 | -.0004 | -.0002 | 101.   |  |
| .0440   | -148. | 39.    | 21.   | 251.     | 94.     | -4.      |     | .0001  | -.0000 | -.0001 | -.0005 | -.0003 | -.0001 | 108.   |  |
| .0450   | 8.    | 14.    | 51.   | 260.     | 2.      | -100.    |     | -.0000 | -.0000 | -.0000 | -.0006 | -.0000 | .0002  | 112.   |  |
| .0460   | 129.  | -57.   | 93.   | 235.     | -78.    | -193.    |     | -.0001 | -.0000 | -.0000 | -.0005 | .0002  | .0005  | 126.   |  |
| .0470   | 120.  | -107.  | 82.   | 186.     | -65.    | -207.    |     | -.0001 | -.0000 | -.0000 | -.0003 | .0002  | .0005  | 115.   |  |
| .0480   | 66.   | -48.   | -42.  | 138.     | 17.     | -148.    |     | -.0000 | -.0000 | -.0000 | -.0002 | -.0000 | .0004  | 82.    |  |
| .0490   | 126.  | 54.    | -170. | 111.     | 37.     | -125.    |     | -.0000 | -.0000 | .0000  | -.0001 | -.0000 | .0004  | 69.    |  |
| .0500   | 311.  | 28.    | -121. | 103.     | -86.    | -217.    |     | -.0001 | -.0000 | .0000  | -.0001 | .0004  | .0007  | 102.   |  |
| .0510   | 471.  | -110.  | 56.   | 97.      | -249.   | -339.    |     | -.0002 | -.0000 | .0000  | -.0002 | .0008  | .0010  | 173.   |  |
| .0520   | 494.  | -128.  | 89.   | 72.      | -200.   | -332.    |     | -.0003 | -.0000 | .0000  | -.0001 | .0009  | .0010  | 177.   |  |
| .0530   | 425.  | 36.    | -104. | 19.      | -175.   | -195.    |     | -.0002 | -.0000 | .0000  | .0000  | .0006  | .0007  | 105.   |  |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |       |       |       |      |       |       |        |        |        |        |        |        |      |
|-------|-------|-------|-------|------|-------|-------|--------|--------|--------|--------|--------|--------|------|
| .0430 | -207. | 18.   | 18.   | 217. | 122.  | 27.   | .0001  | -.0000 | -.0000 | -.0004 | -.0004 | -.0002 | 101. |
| .0440 | -148. | 39.   | 21.   | 251. | 94.   | -4.   | .0001  | -.0000 | -.0001 | -.0005 | -.0003 | -.0001 | 108. |
| .0450 | 8.    | 14.   | 51.   | 260. | 2.    | -100. | -.0000 | -.0000 | -.0000 | -.0006 | -.0006 | .0002  | 112. |
| .0460 | 129.  | -57.  | 97.   | 275. | -78.  | -193. | -.0001 | -.0000 | -.0000 | -.0005 | .0002  | .0005  | 126. |
| .0470 | 120.  | -107. | 82.   | 186. | -65.  | -207. | -.0001 | -.0000 | -.0000 | -.0003 | .0002  | .0005  | 115. |
| .0480 | 66.   | -48.  | -42.  | 138. | 17.   | -148. | -.0000 | -.0000 | -.0000 | -.0002 | -.0000 | .0004  | 82.  |
| .0490 | 126.  | 54.   | -170. | 111. | 37.   | -125. | -.0000 | -.0000 | .0000  | -.0001 | -.0000 | .0004  | 69.  |
| .0500 | 311.  | 28.   | -121. | 103. | -86.  | -217. | -.0001 | -.0000 | .0000  | -.0001 | .0004  | .0007  | 102. |
| .0510 | 471.  | -110. | 56.   | 97.  | -249. | -339. | -.0002 | -.0000 | .0000  | -.0002 | .0008  | .0010  | 173. |
| .0520 | 494.  | -128. | 89.   | 72.  | -200. | -332. | -.0003 | -.0000 | .0000  | -.0001 | .0009  | .0010  | 177. |
| .0530 | 425.  | 36.   | -104. | 19.  | -175. | -195. | -.0002 | -.0000 | .0000  | .0000  | .0006  | .0007  | 105. |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION    | 48      | MEMBER  | 2       | SEQUENCE   | 67         | LOCATION   | END     | TYPE    | EL      |          |          |          |              |  |
|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|--|
| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |  |
| .0540      | 385.    | 136.    | -247.   | -54.       | -107.      | -93.       | -.0002  | .0000   | .0000   | .0002    | .0005    | .0004    | 61.          |  |
| .0550      | 437.    | 20.     | -154.   | -126.      | -186.      | -127.      | -.0002  | .0000   | .0001   | .0003    | .0007    | .0005    | 104.         |  |
| .0560      | 544.    | -114.   | -14.    | -174.      | -315.      | -198.      | -.0003  | .0000   | .0001   | .0004    | .0010    | .0007    | 165.         |  |
| .0570      | 589.    | -61.    | -33.    | -189.      | -344.      | -157.      | -.0003  | .0000   | .0001   | .0004    | .0011    | .0007    | 170.         |  |
| .0580      | 481.    | 76.     | -112.   | -183.      | -267.      | -3.        | -.0002  | .0000   | .0000   | .0004    | .0009    | .0003    | 130.         |  |
| .0590      | 292.    | 130.    | -96.    | -177.      | -164.      | 159.       | -.0001  | .0000   | .0000   | .0003    | .0006    | -.0002   | 121.         |  |
| .0600      | 185.    | 121.    | -36.    | -188.      | -165.      | 252.       | -.0000  | .0000   | .0000   | .0003    | .0006    | -.0005   | 143.         |  |
| .0610      | 183.    | 108.    | -6.     | -222.      | -192.      | 288.       | -.0000  | .0000   | .0000   | .0003    | .0006    | -.0006   | 165.         |  |
| .0620      | 135.    | 61.     | 40.     | -268.      | -198.      | 328.       | -.0000  | .0000   | .0000   | .0004    | .0006    | -.0007   | 187.         |  |
| .0630      | -46.    | 19.     | 82.     | -299.      | -125.      | 430.       | .0001   | .0000   | .0000   | .0005    | .0004    | -.0010   | 216.         |  |
| .0640      | -262.   | 88.     | 32.     | -290.      | 12.        | 582.       | .0002   | .0000   | .0000   | .0005    | -.0001   | -.0015   | 261.         |  |
| .0650      | -405.   | 194.    | -18.    | -235.      | 116.       | 697.       | .0003   | .0000   | .0000   | .0003    | -.0003   | -.0018   | 299.         |  |
| .0660      | -500.   | 168.    | 102.    | -152.      | 130.       | 718.       | .0003   | -.0000  | -.0000  | .0001    | -.0004   | -.0019   | 299.         |  |
| .0670      | -613.   | 72.     | 285.    | -75.       | 130.       | 709.       | .0003   | -.0000  | -.0001  | -.0001   | -.0005   | -.0020   | 291.         |  |
| .0680      | -740.   | 102.    | 281.    | -30.       | 217.       | 752.       | .0004   | -.0000  | -.0001  | -.0002   | -.0008   | -.0021   | 314.         |  |
| .0690      | -851.   | 201.    | 133.    | -26.       | 357.       | 805.       | .0005   | -.0000  | -.0001  | -.0002   | -.0012   | -.0023   | 353.         |  |
| .0700      | -925.   | 151.    | 99.     | -41.       | 437.       | 762.       | .0005   | -.0000  | -.0001  | -.0001   | -.0014   | -.0022   | 353.         |  |
| .0710      | -940.   | -19.    | 196.    | -39.       | 439.       | 622.       | .0005   | .0000   | -.0000  | -.0000   | -.0015   | -.0019   | 306.         |  |
| .0720      | -896.   | -79.    | 222.    | 9.         | 442.       | 486.       | .0004   | .0000   | -.0000  | -.0001   | -.0015   | -.0016   | 264.         |  |
| .0730      | -839.   | 7.      | 142.    | 96.        | 482.       | 395.       | .0004   | -.0000  | -.0001  | -.0003   | -.0015   | -.0013   | 253.         |  |
| .0740      | -773.   | 58.     | 101.    | 188.       | 504.       | 280.       | .0004   | -.0000  | -.0001  | -.0005   | -.0016   | -.0010   | 243.         |  |
| .0750      | -638.   | -0.     | 124.    | 244.       | 461.       | 80.        | .0003   | -.0000  | -.0001  | -.0006   | -.0015   | -.0005   | 212.         |  |
| .0760      | -409.   | -91.    | 108.    | 245.       | 382.       | -178.      | .0002   | -.0000  | -.0001  | -.0005   | -.0012   | .0002    | 196.         |  |
| .0770      | -166.   | -163.   | 24.     | 206.       | 319.       | -429.      | .0000   | -.0000  | -.0000  | -.0003   | -.0009   | .0009    | 230.         |  |
| .0780      | 27.     | -218.   | -72.    | 161.       | 201.       | -638.      | -.0001  | .0000   | .0000   | -.0001   | -.0008   | .0015    | 287.         |  |
| .0790      | 212.    | -236.   | -153.   | 142.       | 235.       | -815.      | -.0001  | .0000   | .0000   | .0000    | -.0006   | .0020    | 345.         |  |
| .0800      | 449.    | -219.   | -202.   | 157.       | 139.       | -989.      | -.0003  | .0000   | .0001   | .0000    | -.0003   | .0025    | 406.         |  |
| .0810      | 701.    | -230.   | -181.   | 183.       | -3.        | -1164.     | -.0004  | .0000   | .0001   | -.0000   | .0002    | .0031    | 473.         |  |
| .0820      | 879.    | -278.   | -128.   | 185.       | -128.      | -1294.     | -.0005  | .0000   | .0001   | -.0001   | .0005    | .0034    | 527.         |  |
| .0830      | 947.    | -287.   | -148.   | 142.       | -174.      | -1324.     | -.0005  | .0000   | .0001   | .0001    | .0007    | .0035    | 539.         |  |
| .0840      | 938.    | -244.   | -249.   | 62.        | -158.      | -1266.     | -.0005  | .0000   | .0001   | .0002    | .0006    | .0034    | 513.         |  |
| .0850      | 896.    | -236.   | -301.   | -23.       | -152.      | -1184.     | -.0005  | .0001   | .0001   | .0004    | .0006    | .0032    | 479.         |  |
| .0860      | 823.    | -292.   | -226.   | -79.       | -189.      | -1092.     | -.0005  | .0001   | .0001   | .0005    | .0007    | .0029    | 446.         |  |
| .0870      | 684.    | -309.   | -108.   | -86.       | -215.      | -932.      | -.0004  | .0001   | .0001   | .0005    | .0007    | .0025    | 385.         |  |
| .0880      | 451.    | -212.   | -46.    | -56.       | -174.      | -656.      | -.0003  | .0000   | .0001   | .0003    | .0005    | .0017    | 273.         |  |
| .0890      | 144.    | -73.    | -10.    | -21.       | -89.       | -312.      | -.0001  | .0000   | .0000   | .0001    | .0002    | .0008    | 130.         |  |
| .0900      | -171.   | -10.    | 78.     | -12.       | -25.       | 18.        | .0001   | -.0000  | -.0000  | -.0000   | -.0001   | -.0002   | 13.          |  |
| .0910      | -450.   | -23.    | 207.    | -36.       | -0.        | 306.       | .0002   | -.0000  | -.0000  | -.0001   | -.0002   | -.0010   | 123.         |  |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |       |       |      |       |        |        |        |        |        |        |        |      |
|-------|-------|-------|-------|------|-------|--------|--------|--------|--------|--------|--------|--------|------|
| .0810 | 701.  | -230. | -181. | 183. | -3.   | -1164. | -.0004 | .0000  | .0001  | -.0000 | .0002  | .0031  | 473. |
| .0820 | 879.  | -278. | -128. | 185. | -128. | -1294. | -.0005 | .0000  | .0001  | -.0001 | .0005  | .0034  | 527. |
| .0830 | 947.  | -287. | -148. | 142. | -174. | -1324. | -.0005 | .0000  | .0001  | .0001  | .0007  | .0035  | 539. |
| .0840 | 938.  | -244. | -249. | 62.  | -158. | -1266. | -.0005 | .0000  | .0001  | .0002  | .0006  | .0034  | 513. |
| .0850 | 896.  | -236. | -301. | -23. | -152. | -1184. | -.0005 | .0001  | .0001  | .0004  | .0006  | .0032  | 479. |
| .0860 | 823.  | -292. | -226. | -79. | -189. | -1092. | -.0005 | .0001  | .0001  | .0005  | .0007  | .0029  | 446. |
| .0870 | 684.  | -309. | -108. | -86. | -215. | -932.  | -.0004 | .0001  | .0001  | .0005  | .0007  | .0025  | 385. |
| .0880 | 451.  | -212. | -46.  | -56. | -174. | -656.  | -.0003 | .0000  | .0001  | .0003  | .0005  | .0017  | 273. |
| .0890 | 144.  | -73.  | -10.  | -21. | -89.  | -312.  | -.0001 | .0000  | .0000  | .0001  | .0002  | .0008  | 130. |
| .0900 | -171. | -10.  | 73.   | -12. | -25.  | 18.    | .0001  | -.0000 | -.0000 | -.0000 | -.0001 | -.0002 | 13.  |
| .0910 | -450. | -23.  | 207.  | -36. | -0.   | 306.   | .0002  | -.0000 | -.0000 | -.0001 | -.0002 | -.0010 | 123. |

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CONDITION 24

LOADS

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PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 48     | MEMBER | 2     | SEQUENCE | 67      | LOCATION | END | TYPE   | EL     |        |        |        |        |        |  |
|---------|--------|--------|-------|----------|---------|----------|-----|--------|--------|--------|--------|--------|--------|--------|--|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       |     | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  |     | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |
| .0920   | -707.  | -30.   | 306.  | -77.     | 25.     | 586.     |     | .0003  | -.0000 | -.0001 | -.0001 | -.0004 | -.0018 | 237.   |  |
| .0930   | -971.  | 16.    | 360.  | -104.    | 76.     | 886.     |     | .0005  | -.0000 | -.0001 | -.0001 | -.0006 | -.0026 | 359.   |  |
| .0940   | -1226. | 88.    | 419.  | -96.     | 130.    | 1179.    |     | .0006  | -.0000 | -.0001 | -.0002 | -.0008 | -.0034 | 478.   |  |
| .0950   | -1426. | 139.   | 525.  | -54.     | 147.    | 1415.    |     | .0007  | -.0001 | -.0001 | -.0004 | -.0010 | -.0041 | 571.   |  |
| .0960   | -1548. | 156.   | 655.  | 2.       | 130.    | 1570.    |     | .0008  | -.0001 | -.0002 | -.0006 | -.0010 | -.0045 | 632.   |  |
| .0970   | -1626. | 152.   | 758.  | 44.      | 118.    | 1666.    |     | .0008  | -.0001 | -.0002 | -.0008 | -.0010 | -.0048 | 671.   |  |
| .0980   | -1694. | 143.   | 794.  | 56.      | 149.    | 1725.    |     | .0009  | -.0001 | -.0002 | -.0008 | -.0011 | -.0050 | 695.   |  |
| .0990   | -1734. | 139.   | 758.  | 45.      | 215.    | 1738.    |     | .0009  | -.0001 | -.0002 | -.0008 | -.0012 | -.0050 | 703.   |  |
| .1000   | -1706. | 127.   | 687.  | 30.      | 282.    | 1676.    |     | .0009  | -.0001 | -.0002 | -.0007 | -.0014 | -.0049 | 682.   |  |
| .1010   | -1615. | 86.    | 634.  | 35.      | 332.    | 1531.    |     | .0008  | -.0001 | -.0002 | -.0006 | -.0015 | -.0045 | 629.   |  |
| .1020   | -1517. | 24.    | 605.  | 67.      | 390.    | 1339.    |     | .0008  | -.0001 | -.0002 | -.0006 | -.0016 | -.0039 | 560.   |  |
| .1030   | -1446. | -7.    | 537.  | 117.     | 495.    | 1144.    |     | .0007  | -.0001 | -.0001 | -.0006 | -.0018 | -.0034 | 503.   |  |
| .1040   | -1362. | 25.    | 371.  | 162.     | 644.    | 947.     |     | .0007  | -.0000 | -.0001 | -.0006 | -.0021 | -.0029 | 464.   |  |
| .1050   | -1220. | 23.    | 190.  | 180.     | 770.    | 692.     |     | .0006  | -.0000 | -.0001 | -.0005 | -.0024 | -.0022 | 422.   |  |
| .1060   | -1017. | -103.  | 91.   | 166.     | 827.    | 347.     |     | .0005  | .0000  | -.0001 | -.0003 | -.0025 | -.0013 | 366.   |  |
| .1070   | -765.  | -281.  | 25.   | 136.     | 845.    | -32.     |     | .0004  | .0000  | -.0000 | -.0001 | -.0024 | -.0003 | 344.   |  |
| .1080   | -516.  | -320.  | -177. | 115.     | 881.    | -362.    |     | .0003  | .0001  | .0000  | .0002  | -.0024 | .0007  | 385.   |  |
| .1090   | -163.  | -199.  | -502. | 121.     | 899.    | -650.    |     | .0001  | .0001  | .0001  | .0003  | -.0023 | .0016  | 448.   |  |
| .1100   | 149.   | -356.  | -458. | 146.     | 757.    | -1003.   |     | -.0001 | .0001  | .0001  | .0003  | -.0019 | .0025  | 508.   |  |
| .1110   | 482.   | -575.  | -308. | 173.     | 525.    | -1355.   |     | -.0003 | .0001  | .0001  | .0003  | -.0012 | .0035  | 587.   |  |
| .1120   | 931.   | -479.  | -493. | 180.     | 328.    | -1592.   |     | -.0005 | .0001  | .0001  | .0004  | -.0005 | .0042  | 656.   |  |
| .1130   | 1413.  | -316.  | -750. | 157.     | 103.    | -1771.   |     | -.0007 | .0001  | .0002  | .0005  | .0003  | .0049  | 715.   |  |
| .1140   | 1810.  | -441.  | -676. | 114.     | -248.   | -1977.   |     | -.0009 | .0001  | .0002  | .0006  | .0013  | .0056  | 801.   |  |
| .1150   | 2141.  | -617.  | -488. | 85.      | -644.   | -2124.   |     | -.0011 | .0001  | .0002  | .0006  | .0023  | .0060  | 891.   |  |
| .1160   | 2476.  | -458.  | -569. | 98.      | -963.   | -2090.   |     | -.0013 | .0001  | .0002  | .0006  | .0033  | .0061  | 924.   |  |
| .1170   | 2758.  | -146.  | -709. | 155.     | -1255.  | -1924.   |     | -.0014 | .0000  | .0002  | .0003  | .0042  | .0058  | 924.   |  |
| .1180   | 2821.  | -149.  | -435. | 226.     | -1618.  | -1738.   |     | -.0014 | -.0000 | .0001  | -.0000 | .0051  | .0053  | 957.   |  |
| .1190   | 2693.  | -238.  | -55.  | 285.     | -1930.  | -1460.   |     | -.0014 | -.0001 | .0001  | -.0004 | .0058  | .0045  | 978.   |  |
| .1200   | 2515.  | 14.    | -69.  | 321.     | -2057.  | -995.    |     | -.0013 | -.0001 | .0000  | -.0006 | .0060  | .0033  | 926.   |  |
| .1210   | 2294.  | 356.   | -191. | 344.     | -2110.  | -462.    |     | -.0011 | -.0001 | -.0000 | -.0008 | .0062  | .0020  | 878.   |  |
| .1220   | 1928.  | 333.   | 97.   | 380.     | -2235.  | -14.     |     | -.0010 | -.0002 | -.0001 | -.0011 | .0063  | .0007  | 910.   |  |
| .1230   | 1412.  | 187.   | 509.  | 456.     | -2328.  | 446.     |     | -.0007 | -.0002 | -.0001 | -.0015 | .0063  | -.0007 | 969.   |  |
| .1240   | 831.   | 414.   | 694.  | 577.     | -2219.  | 1070.    |     | -.0004 | -.0003 | -.0002 | -.0020 | .0058  | -.0024 | 1015.  |  |
| .1250   | 223.   | 825.   | 630.  | 707.     | -1986.  | 1757.    |     | -.0001 | -.0003 | -.0003 | -.0025 | .0051  | -.0043 | 1101.  |  |
| .1260   | -408.  | 899.   | 862.  | 793.     | -1826.  | 2276.    |     | .0002  | -.0004 | -.0004 | -.0029 | .0044  | -.0059 | 1214.  |  |
| .1270   | -963.  | 713.   | 1239. | 809.     | -1719.  | 2598.    |     | .0005  | -.0004 | -.0004 | -.0031 | .0039  | -.0069 | 1291.  |  |
| .1280   | -1349. | 720.   | 1272. | 772.     | -1514.  | 2851.    |     | .0007  | -.0004 | -.0005 | -.0030 | .0032  | -.0077 | 1332.  |  |
| .1290   | -1618. | 877.   | 1068. | 729.     | -1219.  | 3037.    |     | .0008  | -.0004 | -.0004 | -.0029 | .0024  | -.0082 | 1345.  |  |

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18.29.01.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |       |       |      |        |        |        |        |        |        |       |        |       |
|-------|--------|-------|-------|------|--------|--------|--------|--------|--------|--------|-------|--------|-------|
| .1190 | 2693.  | -238. | -55.  | 285. | -1930. | -1460. | -.0014 | -.0001 | .0001  | -.0004 | .0058 | .0045  | 978.  |
| .1200 | 2515.  | 14.   | -69.  | 321. | -2057. | -995.  | -.0013 | -.0001 | .0000  | -.0006 | .0060 | .0033  | 926.  |
| .1210 | 2294.  | 356.  | -191. | 344. | -2110. | -462.  | -.0011 | -.0001 | -.0000 | -.0008 | .0062 | .0020  | 878.  |
| .1220 | 1628.  | 373.  | 97.   | 380. | -2235. | -14.   | -.0010 | -.0002 | -.0001 | -.0011 | .0063 | .0007  | 910.  |
| .1230 | 1412.  | 187.  | 569.  | 456. | -2328. | 446.   | -.0007 | -.0002 | -.0001 | -.0015 | .0063 | -.0007 | 969.  |
| .1240 | 831.   | 414.  | 694.  | 577. | -2219. | 1070.  | -.0004 | -.0003 | -.0002 | -.0020 | .0058 | -.0024 | 1015. |
| .1250 | 223.   | 825.  | 630.  | 707. | -1986. | 1757.  | -.0001 | -.0003 | -.0003 | -.0025 | .0051 | -.0043 | 1101. |
| .1260 | -408.  | 899.  | 862.  | 793. | -1826. | 2276.  | .0002  | -.0004 | -.0004 | -.0029 | .0044 | -.0059 | 1214. |
| .1270 | -963.  | 713.  | 1239. | 809. | -1719. | 2598.  | .0005  | -.0004 | -.0004 | -.0031 | .0039 | -.0069 | 1291. |
| .1280 | -1340. | 720.  | 1272. | 772. | -1514. | 2851.  | .0007  | -.0004 | -.0005 | -.0030 | .0032 | -.0077 | 1332. |
| .1290 | -1618. | 877.  | 1068. | 729. | -1219. | 3037.  | .0008  | -.0004 | -.0004 | -.0029 | .0024 | -.0082 | 1345. |

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ADLPIPE STRESS ANALYSIS

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18.29.01.

S/RV PIPING KEWAUNEE GKW02F 2 RUP DISK

2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | END     | TYPE    | EL      |        |        |        |        |        |        |       | STRESS |
|---------|--------|----------|----------|---------|---------|---------|--------|--------|--------|--------|--------|--------|-------|--------|
| TIME    | FX     | FY       | FZ       | MX      | MY      | MZ      | DX     | DY     | DZ     | RX     | RY     | RZ     |       |        |
| (SEC)   | (LB)   | (LB)     | (LB)     | (FT-LB) | (FT-LB) | (FT-LB) | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI) |        |
| .1300   | -1879. | 816.     | 1090.    | 723.    | -964.   | 3054.   | .0009  | -.0003 | -.0004 | -.0028 | .0017  | -.0084 | 1317. |        |
| .1310   | -2075. | 628.     | 1270.    | 769.    | -755.   | 2913.   | .0010  | -.0003 | -.0005 | -.0029 | .0010  | -.0081 | 1246. |        |
| .1320   | -2059. | 662.     | 1192.    | 835.    | -506.   | 2688.   | .0010  | -.0004 | -.0005 | -.0030 | .0004  | -.0076 | 1148. |        |
| .1330   | -1841. | 784.     | 921.     | 856.    | -245.   | 2338.   | .0009  | -.0003 | -.0004 | -.0029 | -.0001 | -.0065 | 1004. |        |
| .1340   | -1558. | 599.     | 813.     | 780.    | -48.    | 1775.   | .0008  | -.0003 | -.0004 | -.0026 | -.0005 | -.0050 | 778.  |        |
| .1350   | -1250. | 206.     | 758.     | 611.    | 150.    | 1067.   | .0006  | -.0002 | -.0003 | -.0019 | -.0009 | -.0032 | 497.  |        |
| .1360   | -871.  | 3.       | 413.     | 412.    | 456.    | 365.    | .0004  | -.0001 | -.0002 | -.0011 | -.0015 | -.0013 | 287.  |        |
| .1370   | -454.  | -49.     | -61.     | 258.    | 814.    | -322.   | .0002  | -.0000 | -.0000 | -.0004 | -.0022 | .0006  | 366.  |        |
| .1380   | -91.   | -258.    | -249.    | 184.    | 1089.   | -1057.  | .0000  | .0000  | .0000  | .0001  | -.0028 | .0026  | 614.  |        |
| .1390   | 234.   | -548.    | -249.    | 167.    | 1302.   | -1798.  | -.0001 | .0001  | .0001  | .0003  | -.0033 | .0045  | 893.  |        |
| .1400   | 581.   | -641.    | -452.    | 138.    | 1563.   | -2442.  | -.0003 | .0001  | .0001  | .0006  | -.0038 | .0063  | 1165. |        |
| .1410   | 883.   | -666.    | -800.    | 31.     | 1875.   | -2992.  | -.0005 | .0002  | .0002  | .0011  | -.0044 | .0078  | 1417. |        |
| .1420   | 1014.  | -934.    | -975.    | -164.   | 2169.   | -3502.  | -.0005 | .0003  | .0003  | .0018  | -.0051 | .0091  | 1654. |        |
| .1430   | 989.   | -1302.   | -1038.   | -384.   | 2453.   | -3908.  | -.0005 | .0004  | .0004  | .0025  | -.0059 | .0100  | 1858. |        |
| .1440   | 921.   | -1409.   | -1241.   | -539.   | 2755.   | -4110.  | -.0005 | .0005  | .0005  | .0031  | -.0067 | .0105  | 1997. |        |
| .1450   | 834.   | -1314.   | -1429.   | -576.   | 2992.   | -4138.  | -.0004 | .0005  | .0005  | .0032  | -.0072 | .0106  | 2062. |        |
| .1460   | 662.   | -1319.   | -1294.   | -514.   | 3069.   | -4076.  | -.0004 | .0004  | .0005  | .0030  | -.0075 | .0104  | 2058. |        |
| .1470   | 395.   | -1387.   | -994.    | -426.   | 3055.   | -3903.  | -.0003 | .0004  | .0004  | .0027  | -.0076 | .0098  | 1996. |        |
| .1480   | 65.    | -1282.   | -890.    | -385.   | 3080.   | -3536.  | -.0001 | .0004  | .0004  | .0024  | -.0078 | .0088  | 1888. |        |
| .1490   | -332.  | -1088.   | -930.    | -413.   | 3129.   | -3013.  | .0001  | .0004  | .0003  | .0024  | -.0080 | .0073  | 1751. |        |
| .1500   | -788.  | -1040.   | -807.    | -468.   | 3078.   | -2447.  | .0004  | .0004  | .0003  | .0023  | -.0081 | .0057  | 1589. |        |
| .1510   | -1217. | -1045.   | -520.    | -472.   | 2891.   | -1859.  | .0006  | .0003  | .0003  | .0021  | -.0078 | .0041  | 1392. |        |
| .1520   | -1557. | -854.    | -278.    | -366.   | 2631.   | -1193.  | .0007  | .0003  | .0002  | .0016  | -.0073 | .0023  | 1168. |        |
| .1530   | -1873. | -511.    | -52.     | -156.   | 2333.   | -452.   | .0009  | .0001  | .0000  | .0008  | -.0066 | .0004  | 956.  |        |
| .1540   | -2242. | -240.    | 296.     | 92.     | 2000.   | 296.    | .0011  | .0000  | -.0001 | -.0002 | -.0059 | -.0016 | 812.  |        |
| .1550   | -2611. | -42.     | 651.     | 305.    | 1660.   | 1010.   | .0013  | -.0001 | -.0002 | -.0010 | -.0053 | -.0036 | 789.  |        |
| .1560   | -2870. | 205.     | 822.     | 440.    | 1343.   | 1669.   | .0014  | -.0002 | -.0003 | -.0016 | -.0045 | -.0053 | 878.  |        |
| .1570   | -2995. | 421.     | 896.     | 509.    | 1015.   | 2212.   | .0015  | -.0002 | -.0004 | -.0019 | -.0037 | -.0067 | 998.  |        |
| .1580   | -3035. | 479.     | 1074.    | 558.    | 633.    | 2596.   | .0015  | -.0002 | -.0004 | -.0022 | -.0028 | -.0077 | 1095. |        |
| .1590   | -3010. | 513.     | 1272.    | 639.    | 254.    | 2872.   | .0015  | -.0003 | -.0005 | -.0025 | -.0019 | -.0084 | 1185. |        |
| .1600   | -2900. | 676.     | 1331.    | 768.    | -59.    | 3081.   | .0014  | -.0003 | -.0005 | -.0030 | -.0010 | -.0089 | 1274. |        |
| .1610   | -2702. | 882.     | 1300.    | 917.    | -320.   | 3183.   | .0013  | -.0004 | -.0005 | -.0034 | -.0003 | -.0090 | 1335. |        |
| .1620   | -2412. | 943.     | 1316.    | 1030.   | -588.   | 3099.   | .0012  | -.0004 | -.0006 | -.0037 | .0005  | -.0087 | 1331. |        |
| .1630   | -1994. | 863.     | 1320.    | 1065.   | -860.   | 2817.   | .0010  | -.0004 | -.0005 | -.0037 | .0013  | -.0079 | 1257. |        |
| .1640   | -1447. | 773.     | 1175.    | 1014.   | -1083.  | 2400.   | .0007  | -.0004 | -.0005 | -.0034 | .0021  | -.0067 | 1132. |        |
| .1650   | -845.  | 682.     | 922.     | 905.    | -1243.  | 1897.   | .0004  | -.0004 | -.0004 | -.0030 | .0027  | -.0052 | 980.  |        |
| .1660   | -255.  | 527.     | 702.     | 785.    | -1363.  | 1328.   | .0001  | -.0003 | -.0003 | -.0024 | .0032  | -.0035 | 826.  |        |
| .1670   | 324.   | 354.     | 522.     | 687.    | -1456.  | 722.    | -.0002 | -.0002 | -.0002 | -.0020 | .0037  | -.0018 | 708.  |        |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |      |       |       |        |       |        |        |        |        |        |        |       |
|-------|--------|------|-------|-------|--------|-------|--------|--------|--------|--------|--------|--------|-------|
| .1570 | -2995. | 421. | 896.  | 509.  | 1015.  | 2212. | .0015  | -.0002 | -.0004 | -.0019 | -.0037 | -.0067 | 998.  |
| .1580 | -3035. | 479. | 1074. | 558.  | 677.   | 2596. | .0015  | -.0002 | -.0004 | -.0022 | -.0028 | -.0077 | 1095. |
| .1590 | -3010. | 513. | 1272. | 639.  | 254.   | 2872. | .0015  | -.0003 | -.0005 | -.0025 | -.0019 | -.0084 | 1185. |
| .1600 | -2900. | 676. | 1331. | 763.  | -59.   | 3081. | .0014  | -.0003 | -.0005 | -.0030 | -.0010 | -.0089 | 1274. |
| .1610 | -2702. | 882. | 1300. | 917.  | -320.  | 3183. | .0013  | -.0004 | -.0005 | -.0034 | -.0003 | -.0090 | 1335. |
| .1620 | -2412. | 943. | 1316. | 1030. | -588.  | 3099. | .0012  | -.0004 | -.0006 | -.0037 | .0005  | -.0087 | 1331. |
| .1630 | -1994. | 863. | 1320. | 1065. | -860.  | 2817. | .0010  | -.0004 | -.0005 | -.0037 | .0005  | -.0079 | 1257. |
| .1640 | -1447. | 773. | 1175. | 1014. | -1083. | 2400. | .0007  | -.0004 | -.0005 | -.0034 | .0021  | -.0067 | 1132. |
| .1650 | -845.  | 682. | 922.  | 905.  | -1243. | 1897. | .0004  | -.0004 | -.0004 | -.0030 | .0027  | -.0052 | 980.  |
| .1660 | -255.  | 527. | 702.  | 785.  | -1363. | 1328. | .0001  | -.0003 | -.0003 | -.0024 | .0032  | -.0035 | 826.  |
| .1670 | 324.   | 354. | 522.  | 607.  | -1456. | 722.  | -.0002 | -.0002 | -.0002 | -.0020 | .0037  | -.0018 | 708.  |

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S/RV PIPING KEWAUNEE GKWOBF 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | END   | TYPE   | EL     | TIME   | FX     | FY     | FZ     | MX      | MY      | MZ      | DX   | DY   | DZ   | RX    | RY    | RZ    | STRESS |
|---------|--------|----------|----------|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|------|------|------|-------|-------|-------|--------|
| 48      | 2      | 67       |          |       |        |        | (SEC)  | (LB)   | (LB)   | (LB)   | (FT-LB) | (FT-LB) | (FT-LB) | (IN) | (IN) | (IN) | (DEG) | (DEG) | (DEG) | (PSI)  |
| .1680   | 919.   | 248.     | 303.     | 617.  | -1514. | 113.   | -.0005 | -.0002 | -.0001 | -.0016 | .0040   | -.0001  | 658.    |      |      |      |       |       |       |        |
| .1690   | 1514.  | 168.     | 68.      | 548.  | -1549. | -487.  | -.0008 | -.0001 | -.0001 | -.0013 | .0044   | .0017   | 688.    |      |      |      |       |       |       |        |
| .1700   | 2046.  | 18.      | -110.    | 450.  | -1569. | -1072. | -.0011 | -.0001 | .0000  | -.0008 | .0046   | .0033   | 783.    |      |      |      |       |       |       |        |
| .1710   | 2460.  | -120.    | -258.    | 310.  | -1542. | -1586. | -.0013 | -.0000 | .0001  | -.0003 | .0047   | .0048   | 896.    |      |      |      |       |       |       |        |
| .1720   | 2721.  | -325.    | -445.    | 144.  | -1434. | -1955. | -.0014 | .0000  | .0002  | .0003  | .0045   | .0058   | 975.    |      |      |      |       |       |       |        |
| .1730   | 2819.  | -396.    | -639.    | -11.  | -1259. | -2158. | -.0014 | .0001  | .0002  | .0008  | .0042   | .0064   | 1003.   |      |      |      |       |       |       |        |
| .1740   | 2766.  | -453.    | -732.    | -125. | -1073. | -2219. | -.0014 | .0001  | .0003  | .0011  | .0037   | .0065   | 990.    |      |      |      |       |       |       |        |
| .1750   | 2580.  | -502.    | -703.    | -184. | -898.  | -2149. | -.0013 | .0002  | .0003  | .0012  | .0032   | .0063   | 938.    |      |      |      |       |       |       |        |
| .1760   | 2274.  | -489.    | -635.    | -197. | -708.  | -1932. | -.0011 | .0002  | .0003  | .0012  | .0026   | .0056   | 829.    |      |      |      |       |       |       |        |
| .1770   | 1840.  | -402.    | -574.    | -188. | -481.  | -1560. | -.0009 | .0001  | .0002  | .0011  | .0019   | .0046   | 659.    |      |      |      |       |       |       |        |
| .1780   | 1277.  | -305.    | -477.    | -175. | -233.  | -1064. | -.0006 | .0001  | .0002  | .0009  | .0011   | .0032   | 443.    |      |      |      |       |       |       |        |
| .1790   | 619.   | -226.    | -321.    | -164. | 11.    | -479.  | -.0003 | .0001  | .0001  | .0007  | .0003   | .0015   | 203.    |      |      |      |       |       |       |        |
| .1800   | -70.   | -118.    | -154.    | -148. | 239.   | 170.   | .0001  | .0001  | .0001  | .0005  | -.0005  | -.0004  | 132.    |      |      |      |       |       |       |        |
| .1810   | -736.  | 36.      | 0.       | -116. | 440.   | 848.   | .0004  | .0000  | -.0000 | .0002  | -.0013  | -.0023  | 386.    |      |      |      |       |       |       |        |
| .1820   | -1360. | 190.     | 183.     | -72.  | 597.   | 1510.  | .0008  | -.0000 | -.0001 | -.0001 | -.0019  | -.0041  | 652.    |      |      |      |       |       |       |        |
| .1830   | -1920. | 316.     | 391.     | -17.  | 709.   | 2115.  | .0011  | -.0001 | -.0002 | -.0005 | -.0023  | -.0058  | 895.    |      |      |      |       |       |       |        |
| .1840   | -2383. | 450.     | 557.     | 41.   | 797.   | 2645.  | .0013  | -.0001 | -.0002 | -.0008 | -.0027  | -.0073  | 1109.   |      |      |      |       |       |       |        |
| .1850   | -2727. | 593.     | 660.     | 91.   | 864.   | 3076.  | .0015  | -.0001 | -.0003 | -.0011 | -.0030  | -.0085  | 1283.   |      |      |      |       |       |       |        |
| .1860   | -2945. | 689.     | 751.     | 126.  | 893.   | 3372.  | .0016  | -.0002 | -.0003 | -.0013 | -.0031  | -.0093  | 1401.   |      |      |      |       |       |       |        |
| .1870   | -3025. | 728.     | 832.     | 136.  | 880.   | 3517.  | .0017  | -.0002 | -.0003 | -.0014 | -.0031  | -.0097  | 1456.   |      |      |      |       |       |       |        |
| .1880   | -2951. | 749.     | 842.     | 116.  | 845.   | 3509.  | .0016  | -.0002 | -.0003 | -.0014 | -.0030  | -.0096  | 1449.   |      |      |      |       |       |       |        |
| .1890   | -2738. | 751.     | 770.     | 63.   | 806.   | 3353.  | .0015  | -.0002 | -.0003 | -.0012 | -.0028  | -.0091  | 1384.   |      |      |      |       |       |       |        |
| .1900   | -2433. | 681.     | 674.     | -18.  | 766.   | 3050.  | .0014  | -.0001 | -.0003 | -.0010 | -.0026  | -.0082  | 1262.   |      |      |      |       |       |       |        |
| .1910   | -2063. | 546.     | 566.     | -114. | 732.   | 2620.  | .0012  | -.0001 | -.0002 | -.0006 | -.0023  | -.0070  | 1093.   |      |      |      |       |       |       |        |
| .1920   | -1626. | 417.     | 402.     | -209. | 716.   | 2100.  | .0010  | -.0001 | -.0001 | -.0002 | -.0022  | -.0056  | 894.    |      |      |      |       |       |       |        |
| .1930   | -1132. | 302.     | 195.     | -298. | 710.   | 1512.  | .0007  | -.0000 | -.0001 | .0002  | -.0020  | -.0039  | 681.    |      |      |      |       |       |       |        |
| .1940   | -618.  | 147.     | 10.      | -386. | 695.   | 868.   | .0004  | .0000  | .0000  | .0006  | -.0017  | -.0022  | 472.    |      |      |      |       |       |       |        |
| .1950   | -119.  | -55.     | -150.    | -488. | 680.   | 199.   | .0002  | .0001  | .0001  | .0011  | -.0016  | -.0003  | 345.    |      |      |      |       |       |       |        |
| .1960   | 341.   | -254.    | -339.    | -606. | 688.   | -445.  | -.0001 | .0002  | .0002  | .0016  | -.0014  | .0014   | 409.    |      |      |      |       |       |       |        |
| .1970   | 741.   | -433.    | -553.    | -733. | 719.   | -1032. | -.0003 | .0002  | .0003  | .0022  | -.0014  | .0030   | 584.    |      |      |      |       |       |       |        |
| .1980   | 1069.  | -610.    | -729.    | -845. | 744.   | -1546. | -.0005 | .0003  | .0004  | .0026  | -.0014  | .0044   | 768.    |      |      |      |       |       |       |        |
| .1990   | 1335.  | -765.    | -843.    | -917. | 735.   | -1972. | -.0006 | .0004  | .0004  | .0030  | -.0013  | .0055   | 921.    |      |      |      |       |       |       |        |
| .2000   | 1546.  | -859.    | -907.    | -925. | 686.   | -2285. | -.0007 | .0004  | .0004  | .0031  | -.0011  | .0063   | 1028.   |      |      |      |       |       |       |        |
| .2010   | 1682.  | -895.    | -919.    | -906. | 602.   | -2467. | -.0008 | .0004  | .0005  | .0031  | -.0009  | .0068   | 1082.   |      |      |      |       |       |       |        |
| .2020   | 1720.  | -898.    | -876.    | -849. | 490.   | -2511. | -.0009 | .0004  | .0004  | .0030  | -.0006  | .0069   | 1082.   |      |      |      |       |       |       |        |
| .2030   | 1660.  | -871.    | -798.    | -781. | 360.   | -2416. | -.0008 | .0003  | .0004  | .0027  | -.0003  | .0066   | 1029.   |      |      |      |       |       |       |        |
| .2040   | 1521.  | -804.    | -707.    | -705. | 214.   | -2193. | -.0008 | .0003  | .0004  | .0025  | -.0000  | .0060   | 929.    |      |      |      |       |       |       |        |
| .2050   | 1319.  | -707.    | -582.    | -608. | 41.    | -1863. | -.0007 | .0003  | .0003  | .0021  | .0003   | .0050   | 787.    |      |      |      |       |       |       |        |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |       |       |       |      |        |        |       |       |       |        |        |       |
|-------|-------|-------|-------|-------|------|--------|--------|-------|-------|-------|--------|--------|-------|
| .1950 | -119. | -55.  | -150. | -488. | 680. | 199.   | .0002  | .0001 | .0001 | .0011 | -.0016 | -.0003 | 472.  |
| .1960 | 341.  | -254. | -339. | -606. | 688. | -445.  | -.0001 | .0002 | .0002 | .0016 | -.0014 | .0014  | 409.  |
| .1970 | 741.  | -433. | -553. | -733. | 719. | -1032. | -.0003 | .0002 | .0003 | .0022 | -.0014 | .0030  | 584.  |
| .1980 | 1049. | -610. | -729. | -845. | 744. | -1546. | -.0005 | .0003 | .0004 | .0026 | -.0014 | .0044  | 768.  |
| .1990 | 1335. | -765. | -843. | -917. | 735. | -1972. | -.0006 | .0004 | .0004 | .0030 | -.0013 | .0055  | 921.  |
| .2000 | 1546. | -859. | -907. | -935. | 686. | -2285. | -.0007 | .0004 | .0004 | .0031 | -.0011 | .0063  | 1028. |
| .2010 | 1682. | -895. | -919. | -906. | 602. | -2467. | -.0008 | .0004 | .0005 | .0031 | -.0009 | .0068  | 1082. |
| .2020 | 1720. | -898. | -876. | -849. | 490. | -2511. | -.0009 | .0004 | .0004 | .0030 | -.0006 | .0069  | 1082. |
| .2030 | 1660. | -871. | -798. | -781. | 360. | -2416. | -.0008 | .0003 | .0004 | .0027 | -.0003 | .0066  | 1029. |
| .2040 | 1521. | -804. | -707. | -705. | 214. | -2193. | -.0008 | .0003 | .0004 | .0025 | -.0000 | .0060  | 929.  |
| .2050 | 1319. | -707. | -582. | -608. | 41.  | -1863. | -.0007 | .0003 | .0003 | .0021 | .0003  | .0050  | 787.  |

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18.29.01.

S/RV PIPING KEWAUNEE GKWOFF 2 RUP DISK

2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 48     | MEMBER | 2     | SEQUENCE | 67      | LOCATION | END | TYPE   | EL     |        |        |        |        |        |  |
|---------|--------|--------|-------|----------|---------|----------|-----|--------|--------|--------|--------|--------|--------|--------|--|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       |     | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  |     | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |
| .2060   | 1065.  | -587.  | -393. | -469.    | -167.   | -1447.   |     | -.0006 | .0002  | .0002  | .0016  | .0007  | .0039  | 614.   |  |
| .2070   | 769.   | -429.  | -154. | -281.    | -400.   | -955.    |     | -.0004 | .0001  | .0002  | .0010  | .0011  | .0025  | 431.   |  |
| .2080   | 441.   | -223.  | 99.   | -53.     | -634.   | -405.    |     | -.0003 | .0000  | .0000  | .0002  | .0016  | .0010  | 303.   |  |
| .2090   | 90.    | 1.     | 352.  | 187.     | -858.   | 170.     |     | -.0001 | -.0001 | -.0001 | -.0006 | .0020  | -.0006 | 359.   |  |
| .2100   | -263.  | 202.   | 599.  | 409.     | -1067.  | 727.     |     | .0000  | -.0002 | -.0002 | -.0014 | .0024  | -.0021 | 544.   |  |
| .2110   | -591.  | 361.   | 824.  | 594.     | -1256.  | 1230.    |     | .0002  | -.0002 | -.0003 | -.0020 | .0027  | -.0035 | 745.   |  |
| .2120   | -873.  | 491.   | 1004. | 740.     | -1415.  | 1655.    |     | .0003  | -.0003 | -.0004 | -.0026 | .0030  | -.0047 | 923.   |  |
| .2130   | -1096. | 595.   | 1139. | 859.     | -1541.  | 1986.    |     | .0004  | -.0004 | -.0004 | -.0030 | .0032  | -.0056 | 1066.  |  |
| .2140   | -1251. | 669.   | 1246. | 963.     | -1635.  | 2204.    |     | .0005  | -.0004 | -.0005 | -.0033 | .0034  | -.0062 | 1167.  |  |
| .2150   | -1326. | 709.   | 1321. | 1052.    | -1697.  | 2294.    |     | .0005  | -.0004 | -.0005 | -.0036 | .0035  | -.0065 | 1221.  |  |
| .2160   | -1314. | 718.   | 1346. | 1117.    | -1720.  | 2251.    |     | .0005  | -.0004 | -.0005 | -.0037 | .0035  | -.0064 | 1222.  |  |
| .2170   | -1220. | 688.   | 1308. | 1138.    | -1697.  | 2077.    |     | .0005  | -.0004 | -.0005 | -.0037 | .0035  | -.0060 | 1169.  |  |
| .2180   | -1053. | 603.   | 1210. | 1105.    | -1627.  | 1776.    |     | .0004  | -.0004 | -.0005 | -.0035 | .0034  | -.0052 | 1063.  |  |
| .2190   | -822.  | 465.   | 1063. | 1013.    | -1517.  | 1362.    |     | .0003  | -.0004 | -.0004 | -.0031 | .0032  | -.0041 | 914.   |  |
| .2200   | -533.  | 294.   | 870.  | 881.     | -1374.  | 859.     |     | .0001  | -.0003 | -.0003 | -.0026 | .0029  | -.0027 | 740.   |  |
| .2210   | -206.  | 109.   | 648.  | 728.     | -1204.  | 299.     |     | -.0001 | -.0002 | -.0002 | -.0020 | .0026  | -.0012 | 577.   |  |
| .2220   | 124.   | -80.   | 421.  | 572.     | -1008.  | -283.    |     | -.0002 | -.0001 | -.0001 | -.0014 | .0022  | .0004  | 479.   |  |
| .2230   | 430.   | -263.  | 195.  | 420.     | -787.   | -849.    |     | -.0004 | -.0001 | -.0000 | -.0008 | .0018  | .0019  | 494.   |  |
| .2240   | 703.   | -426.  | -31.  | 274.     | -551.   | -1375.   |     | -.0005 | .0000  | .0000  | -.0002 | .0013  | .0034  | 604.   |  |
| .2250   | 940.   | -573.  | -246. | 131.     | -314.   | -1842.   |     | -.0006 | .0001  | .0001  | .0004  | .0008  | .0046  | 752.   |  |
| .2260   | 1121.  | -713.  | -427. | -9.      | -88.    | -2229.   |     | -.0007 | .0001  | .0002  | .0009  | .0003  | .0057  | 895.   |  |
| .2270   | 1216.  | -829.  | -575. | -139.    | 132.    | -2501.   |     | -.0007 | .0002  | .0003  | .0013  | -.0002 | .0064  | 1006.  |  |
| .2280   | 1213.  | -892.  | -698. | -245.    | 348.    | -2631.   |     | -.0007 | .0003  | .0003  | .0017  | -.0007 | .0068  | 1070.  |  |
| .2290   | 1119.  | -898.  | -781. | -314.    | 544.    | -2618.   |     | -.0007 | .0003  | .0003  | .0019  | -.0012 | .0067  | 1080.  |  |
| .2300   | 948.   | -867.  | -796. | -341.    | 698.    | -2475.   |     | -.0006 | .0003  | .0003  | .0019  | -.0016 | .0063  | 1041.  |  |
| .2310   | 715.   | -799.  | -745. | -326.    | 803.    | -2212.   |     | -.0004 | .0003  | .0003  | .0018  | -.0019 | .0056  | 953.   |  |
| .2320   | 419.   | -680.  | -661. | -278.    | 873.    | -1829.   |     | -.0003 | .0002  | .0003  | .0015  | -.0022 | .0046  | 821.   |  |
| .2330   | 62.    | -519.  | -554. | -209.    | 918.    | -1339.   |     | -.0001 | .0002  | .0002  | .0012  | -.0024 | .0033  | 657.   |  |
| .2340   | -342.  | -346.  | -411. | -128.    | 930.    | -772.    |     | .0001  | .0001  | .0001  | .0008  | -.0025 | .0017  | 488.   |  |
| .2350   | -766.  | -171.  | -235. | -38.     | 906.    | -161.    |     | .0004  | .0001  | .0001  | .0004  | -.0026 | .0001  | 369.   |  |
| .2360   | -1185. | 19.    | -55.  | 60.      | 853.    | 470.     |     | .0006  | .0000  | -.0000 | -.0001 | -.0026 | -.0016 | 392.   |  |
| .2370   | -1586. | 225.   | 116.  | 167.     | 784.    | 1098.    |     | .0008  | -.0000 | -.0001 | -.0006 | -.0025 | -.0033 | 546.   |  |
| .2380   | -1962. | 421.   | 289.  | 279.     | 700.    | 1693.    |     | .0010  | -.0001 | -.0002 | -.0011 | -.0025 | -.0049 | 744.   |  |
| .2390   | -2296. | 586.   | 466.  | 391.     | 604.    | 2222.    |     | .0012  | -.0002 | -.0003 | -.0015 | -.0023 | -.0064 | 937.   |  |
| .2400   | -2574. | 724.   | 621.  | 492.     | 508.    | 2667.    |     | .0013  | -.0002 | -.0003 | -.0019 | -.0022 | -.0076 | 1107.  |  |
| .2410   | -2796. | 841.   | 733.  | 575.     | 427.    | 3022.    |     | .0014  | -.0003 | -.0004 | -.0023 | -.0021 | -.0085 | 1246.  |  |
| .2420   | -2969. | 934.   | 794.  | 632.     | 375.    | 3283.    |     | .0015  | -.0003 | -.0004 | -.0025 | -.0020 | -.0093 | 1350.  |  |
| .2430   | -3090. | 983.   | 817.  | 662.     | 348.    | 3436.    |     | .0016  | -.0003 | -.0004 | -.0026 | -.0020 | -.0097 | 1411.  |  |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |       |       |       |      |        |        |        |        |        |        |        |       |
|-------|--------|-------|-------|-------|------|--------|--------|--------|--------|--------|--------|--------|-------|
| .2330 | 62.    | -519. | -554. | -209. | 918. | -1339. | -.0001 | .0002  | .0002  | .0012  | -.0024 | .0033  | 657.  |
| .2340 | -342.  | -346. | -411. | -128. | 930. | -772.  | .0001  | .0001  | .0001  | .0008  | -.0025 | .0017  | 488.  |
| .2350 | -766.  | -171. | -235. | -38.  | 906. | -161.  | .0004  | .0001  | .0001  | .0004  | -.0026 | .0001  | 369.  |
| .2360 | -1185. | 19.   | -55.  | 60.   | 853. | 470.   | .0006  | .0000  | -.0000 | -.0001 | -.0026 | -.0016 | 392.  |
| .2370 | -1586. | 225.  | 116.  | 167.  | 784. | 1078.  | .0008  | -.0000 | -.0001 | -.0006 | -.0025 | -.0033 | 546.  |
| .2380 | -1962. | 421.  | 289.  | 279.  | 700. | 1693.  | .0010  | -.0001 | -.0002 | -.0011 | -.0025 | -.0049 | 744.  |
| .2390 | -2296. | 586.  | 466.  | 391.  | 604. | 2222.  | .0012  | -.0002 | -.0003 | -.0015 | -.0023 | -.0064 | 937.  |
| .2400 | -2574. | 724.  | 621.  | 492.  | 508. | 2667.  | .0013  | -.0002 | -.0003 | -.0019 | -.0022 | -.0076 | 1107. |
| .2410 | -2796. | 841.  | 733.  | 575.  | 427. | 3022.  | .0014  | -.0003 | -.0004 | -.0023 | -.0021 | -.0085 | 1246. |
| .2420 | -2969. | 934.  | 794.  | 672.  | 371. | 3283.  | .0015  | -.0003 | -.0004 | -.0025 | -.0020 | -.0093 | 1350. |
| .2430 | -3090. | 983.  | 817.  | 662.  | 348. | 3436.  | .0016  | -.0003 | -.0004 | -.0026 | -.0020 | -.0097 | 1411. |

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CONDITION 24

LOADS

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PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 48     | MEMBER | 2     | SEQUENCE | 67      | LOCATION | END | TYPE   | EL     |        |        |        |        |        |  |
|---------|--------|--------|-------|----------|---------|----------|-----|--------|--------|--------|--------|--------|--------|--------|--|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       |     | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  |     | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |
| .2440   | -3146. | 978.   | 818.  | 668.     | 333.    | 3470.    |     | .0016  | -.0003 | -.0004 | -.0026 | -.0020 | -.0098 | 1424.  |  |
| .2450   | -3138. | 927.   | 792.  | 654.     | 333.    | 3390.    |     | .0016  | -.0003 | -.0004 | -.0025 | -.0020 | -.0096 | 1392.  |  |
| .2460   | -3090. | 855.   | 730.  | 630.     | 361.    | 3226.    |     | .0016  | -.0003 | -.0004 | -.0024 | -.0021 | -.0092 | 1327.  |  |
| .2470   | -3028. | 787.   | 620.  | 602.     | 430.    | 3010.    |     | .0015  | -.0002 | -.0004 | -.0022 | -.0022 | -.0087 | 1244.  |  |
| .2480   | -2953. | 712.   | 487.  | 572.     | 521.    | 2752.    |     | .0015  | -.0002 | -.0003 | -.0020 | -.0025 | -.0081 | 1147.  |  |
| .2490   | -2844. | 596.   | 378.  | 440.     | 593.    | 2438.    |     | .0014  | -.0002 | -.0003 | -.0018 | -.0026 | -.0073 | 1030.  |  |
| .2500   | -2694. | 449.   | 290.  | 503.     | 635.    | 2084.    |     | .0013  | -.0001 | -.0002 | -.0015 | -.0027 | -.0064 | 897.   |  |
| .2510   | -2531. | 317.   | 184.  | 465.     | 667.    | 1736.    |     | .0012  | -.0001 | -.0002 | -.0013 | -.0028 | -.0055 | 769.   |  |
| .2520   | -2382. | 227.   | 52.   | 432.     | 700.    | 1433.    |     | .0011  | -.0001 | -.0002 | -.0011 | -.0028 | -.0047 | 663.   |  |
| .2530   | -2251. | 167.   | -71.  | 418.     | 711.    | 1181.    |     | .0011  | -.0000 | -.0001 | -.0009 | -.0028 | -.0040 | 578.   |  |
| .2540   | -2130. | 127.   | -149. | 432.     | 677.    | 981.     |     | .0010  | -.0000 | -.0001 | -.0008 | -.0027 | -.0035 | 509.   |  |
| .2550   | -2029. | 110.   | -174. | 479.     | 594.    | 847.     |     | .0009  | -.0000 | -.0001 | -.0009 | -.0025 | -.0032 | 457.   |  |
| .2560   | -1988. | 142.   | -174. | 553.     | 493.    | 815.     |     | .0009  | -.0000 | -.0001 | -.0011 | -.0023 | -.0031 | 442.   |  |
| .2570   | -2083. | 268.   | -203. | 648.     | 435.    | 946.     |     | .0009  | -.0001 | -.0001 | -.0013 | -.0022 | -.0035 | 492.   |  |
| .2580   | -2352. | 434.   | -215. | 757.     | 425.    | 1234.    |     | .0011  | -.0001 | -.0002 | -.0016 | -.0023 | -.0043 | 606.   |  |
| .2590   | -2778. | 553.   | -117. | 881.     | 419.    | 1631.    |     | .0013  | -.0001 | -.0002 | -.0020 | -.0024 | -.0055 | 763.   |  |
| .2600   | -3344. | 641.   | 76.   | 1024.    | 419.    | 2127.    |     | .0015  | -.0002 | -.0003 | -.0025 | -.0027 | -.0070 | 962.   |  |
| .2610   | -4060. | 782.   | 277.  | 1194.    | 470.    | 2755.    |     | .0019  | -.0003 | -.0004 | -.0031 | -.0031 | -.0089 | 1220.  |  |
| .2620   | -4940. | 992.   | 463.  | 1387.    | 594.    | 3521.    |     | .0023  | -.0003 | -.0005 | -.0038 | -.0038 | -.0112 | 1537.  |  |
| .2630   | -5921. | 1198.  | 690.  | 1593.    | 743.    | 4352.    |     | .0028  | -.0004 | -.0006 | -.0045 | -.0046 | -.0137 | 1884.  |  |
| .2640   | -6836. | 1300.  | 1026. | 1790.    | 804.    | 5108.    |     | .0032  | -.0005 | -.0008 | -.0052 | -.0052 | -.0160 | 2196.  |  |
| .2650   | -7572. | 1303.  | 1432. | 1959.    | 739.    | 5725.    |     | .0035  | -.0005 | -.0009 | -.0058 | -.0054 | -.0179 | 2446.  |  |
| .2660   | -8106. | 1327.  | 1757. | 2086.    | 603.    | 6230.    |     | .0038  | -.0006 | -.0010 | -.0063 | -.0053 | -.0194 | 2648.  |  |
| .2670   | -8401. | 1423.  | 1933. | 2167.    | 413.    | 6619.    |     | .0039  | -.0006 | -.0010 | -.0067 | -.0050 | -.0206 | 2800.  |  |
| .2680   | -8339. | 1480.  | 2071. | 2201.    | 71.     | 6772.    |     | .0038  | -.0007 | -.0011 | -.0069 | -.0041 | -.0209 | 2858.  |  |
| .2690   | -7822. | 1414.  | 2250. | 2191.    | -497.   | 6594.    |     | .0036  | -.0007 | -.0011 | -.0070 | -.0026 | -.0204 | 2795.  |  |
| .2700   | -6885. | 1307.  | 2379. | 2134.    | -1225.  | 6130.    |     | .0031  | -.0007 | -.0010 | -.0069 | -.0004 | -.0189 | 2651.  |  |
| .2710   | -5698. | 1292.  | 2312. | 2031.    | -1949.  | 5521.    |     | .0025  | -.0007 | -.0010 | -.0067 | .0019  | -.0169 | 2487.  |  |
| .2720   | -4405. | 1324.  | 2095. | 1880.    | -2603.  | 4820.    |     | .0018  | -.0007 | -.0009 | -.0062 | .0040  | -.0146 | 2324.  |  |
| .2730   | -3041. | 1237.  | 1907. | 1678.    | -3231.  | 3976.    |     | .0012  | -.0007 | -.0008 | -.0056 | .0061  | -.0119 | 2164.  |  |
| .2740   | -1659. | 1015.  | 1774. | 1434.    | -3810.  | 3011.    |     | .0005  | -.0006 | -.0007 | -.0049 | .0081  | -.0090 | 2032.  |  |
| .2750   | -429.  | 790.   | 1577. | 1162.    | -4199.  | 2074.    |     | -.0001 | -.0005 | -.0005 | -.0041 | .0096  | -.0061 | 1936.  |  |
| .2760   | 431.   | 654.   | 1251. | 881.     | -4258.  | 1323.    |     | -.0005 | -.0004 | -.0004 | -.0032 | .0101  | -.0039 | 1824.  |  |
| .2770   | 849.   | 540.   | 893.  | 611.     | -3992.  | 777.     |     | -.0007 | -.0003 | -.0003 | -.0023 | .0097  | -.0023 | 1650.  |  |
| .2780   | 911.   | 343.   | 635.  | 362.     | -3513.  | 358.     |     | -.0007 | -.0002 | -.0002 | -.0015 | .0085  | -.0012 | 1424.  |  |
| .2790   | 692.   | 74.    | 480.  | 142.     | -2880.  | 44.      |     | -.0006 | -.0001 | -.0001 | -.0007 | .0069  | -.0005 | 1157.  |  |
| .2800   | 170.   | -180.  | 346.  | -51.     | -2068.  | -99.     |     | -.0004 | -.0000 | .0000  | -.0001 | .0047  | -.0003 | 831.   |  |
| .2810   | -659.  | -342.  | 158.  | -221.    | -1067.  | -21.     |     | .0001  | .0001  | .0001  | .0005  | .0019  | -.0008 | 437.   |  |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
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CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |       |       |       |        |       |        |        |        |        |       |        |       |
|-------|--------|-------|-------|-------|--------|-------|--------|--------|--------|--------|-------|--------|-------|
| .2710 | -5698. | 1292. | 2312. | 2031. | -1949. | 5521. | .0025  | -.0007 | -.0010 | -.0067 | .0019 | -.0169 | 2487. |
| .2720 | -4405. | 1324. | 2091. | 1880. | -2603. | 4820. | .0018  | -.0007 | -.0009 | -.0062 | .0040 | -.0146 | 2324. |
| .2730 | -3041. | 1237. | 1907. | 1678. | -3231. | 3976. | .0012  | -.0007 | -.0008 | -.0056 | .0061 | -.0119 | 2164. |
| .2740 | -1659. | 1015. | 1774. | 1434. | -3810. | 3011. | .0005  | -.0006 | -.0007 | -.0049 | .0081 | -.0090 | 2032. |
| .2750 | -429.  | 790.  | 1577. | 1162. | -4199. | 2074. | -.0001 | -.0005 | -.0005 | -.0041 | .0096 | -.0061 | 1936. |
| .2760 | 431.   | 654.  | 1251. | 881.  | -4258. | 1323. | -.0005 | -.0004 | -.0004 | -.0032 | .0101 | -.0039 | 1824. |
| .2770 | 849.   | 540.  | 893.  | 611.  | -3992. | 777.  | -.0007 | -.0003 | -.0003 | -.0023 | .0097 | -.0023 | 1650. |
| .2780 | 911.   | 343.  | 635.  | 362.  | -3512. | 358.  | -.0007 | -.0002 | -.0002 | -.0015 | .0085 | -.0012 | 1424. |
| .2790 | 692.   | 74.   | 480.  | 142.  | -2880. | 44.   | -.0006 | -.0001 | -.0001 | -.0007 | .0069 | -.0005 | 1157. |
| .2800 | 170.   | -180. | 346.  | -51.  | -2068. | -99.  | -.0004 | -.0000 | .0000  | -.0001 | .0047 | -.0003 | 831.  |
| .2810 | -659.  | -342. | 158.  | -221. | -1067. | -21.  | .0001  | .0001  | .0001  | .0005  | .0019 | -.0008 | 437.  |

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ADLPIPE STRESS ANALYSIS

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18.29.01.

S/RV PIPING KEWAUNEE GKMOBF 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 48     | MEMBER | 2     | SEQUENCE | 67      | LOCATION | END    | TYPE   | EL     |        |        |        |        |  |  |
|---------|--------|--------|-------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |  |
| .2820   | -1650. | -429.  | -70.  | -370.    | 16.     | 209.     | .0006  | .0002  | .0001  | .0011  | -.0011 | -.0017 | 171.   |  |  |
| .2830   | -2571. | -526.  | -241. | -496.    | 997.    | 445.     | .0011  | .0003  | .0001  | .0015  | -.0039 | -.0025 | 481.   |  |  |
| .2840   | -3283. | -677.  | -301. | -590.    | 1761.   | 603.     | .0015  | .0003  | .0002  | .0019  | -.0061 | -.0032 | 784.   |  |  |
| .2850   | -3771. | -800.  | -316. | -644.    | 2313.   | 717.     | .0017  | .0004  | .0002  | .0021  | -.0076 | -.0036 | 1005.  |  |  |
| .2860   | -4037. | -779.  | -405. | -654.    | 2689.   | 840.     | .0019  | .0004  | .0002  | .0021  | -.0086 | -.0040 | 1161.  |  |  |
| .2870   | -4015. | -624.  | -565. | -626.    | 2851.   | 932.     | .0019  | .0004  | .0002  | .0021  | -.0089 | -.0041 | 1229.  |  |  |
| .2880   | -3644. | -484.  | -662. | -577.    | 2710.   | 896.     | .0018  | .0003  | .0002  | .0020  | -.0083 | -.0038 | 1169.  |  |  |
| .2890   | -2970. | -440.  | -630. | -525.    | 2273.   | 712.     | .0014  | .0003  | .0002  | .0018  | -.0069 | -.0030 | 979.   |  |  |
| .2900   | -2137. | -394.  | -588. | -475.    | 1674.   | 489.     | .0010  | .0003  | .0002  | .0016  | -.0051 | -.0021 | 725.   |  |  |
| .2910   | -1288. | -228.  | -662. | -422.    | 1055.   | 340.     | .0006  | .0002  | .0002  | .0015  | -.0031 | -.0014 | 476.   |  |  |
| .2920   | -497.  | 2.     | -779. | -354.    | 442.    | 267.     | .0003  | .0002  | .0002  | .0012  | -.0012 | -.0008 | 251.   |  |  |
| .2930   | 205.   | 145.   | -771. | -262.    | -202.   | 212.     | -.0001 | .0001  | .0002  | .0009  | .0007  | -.0004 | 158.   |  |  |
| .2940   | 751.   | 185.   | -619. | -144.    | -837.   | 193.     | -.0004 | .0001  | .0001  | .0006  | .0025  | -.0001 | 349.   |  |  |
| .2950   | 1036.  | 245.   | -467. | -11.     | -1339.  | 313.     | -.0005 | .0000  | .0001  | .0001  | .0038  | -.0004 | 552.   |  |  |
| .2960   | 1003.  | 382.   | -399. | 119.     | -1636.  | 625.     | -.0005 | -.0000 | .0000  | -.0003 | .0046  | -.0012 | 704.   |  |  |
| .2970   | 700.   | 508.   | -342. | 228.     | -1783.  | 1063.    | -.0003 | -.0001 | -.0000 | -.0006 | .0048  | -.0024 | 838.   |  |  |
| .2980   | 251.   | 527.   | -204. | 311.     | -1882.  | 1526.    | -.0001 | -.0001 | -.0001 | -.0009 | .0048  | -.0038 | 980.   |  |  |
| .2990   | -251.  | 473.   | -5.   | 379.     | -1977.  | 1979.    | .0001  | -.0001 | -.0001 | -.0012 | .0048  | -.0052 | 1133.  |  |  |
| .3000   | -768.  | 448.   | 164.  | 445.     | -2056.  | 2451.    | .0003  | -.0001 | -.0001 | -.0014 | .0048  | -.0066 | 1296.  |  |  |
| .3010   | -1249. | 504.   | 267.  | 521.     | -2138.  | 2940.    | .0005  | -.0001 | -.0002 | -.0017 | .0047  | -.0081 | 1474.  |  |  |
| .3020   | -1577. | 601.   | 346.  | 604.     | -2306.  | 3374.    | .0007  | -.0002 | -.0002 | -.0020 | .0050  | -.0093 | 1658.  |  |  |
| .3030   | -1627. | 677.   | 450.  | 681.     | -2651.  | 3665.    | .0007  | -.0002 | -.0003 | -.0023 | .0058  | -.0101 | 1835.  |  |  |
| .3040   | -1367. | 716.   | 576.  | 736.     | -3189.  | 3790.    | .0006  | -.0002 | -.0003 | -.0025 | .0072  | -.0103 | 2009.  |  |  |
| .3050   | -857.  | 767.   | 665.  | 765.     | -3862.  | 3801.    | .0003  | -.0003 | -.0003 | -.0027 | .0091  | -.0102 | 2196.  |  |  |
| .3060   | -166.  | 886.   | 667.  | 773.     | -4606.  | 3754.    | -.0000 | -.0003 | -.0003 | -.0028 | .0112  | -.0098 | 2404.  |  |  |
| .3070   | 671.   | 1055.  | 620.  | 780.     | -5407.  | 3651.    | -.0005 | -.0004 | -.0003 | -.0029 | .0136  | -.0092 | 2637.  |  |  |
| .3080   | 1611.  | 1201.  | 621.  | 801.     | -6268.  | 3474.    | -.0009 | -.0004 | -.0003 | -.0031 | .0161  | -.0084 | 2894.  |  |  |
| .3090   | 2549.  | 1294.  | 706.  | 846.     | -7175.  | 3255.    | -.0014 | -.0005 | -.0003 | -.0033 | .0186  | -.0075 | 3165.  |  |  |
| .3100   | 3342.  | 1395.  | 801.  | 909.     | -7886.  | 3083.    | -.0018 | -.0005 | -.0003 | -.0036 | .0208  | -.0068 | 3417.  |  |  |
| .3110   | 3882.  | 1548.  | 836.  | 977.     | -8420.  | 3025.    | -.0021 | -.0006 | -.0003 | -.0039 | .0223  | -.0065 | 3612.  |  |  |
| .3120   | 4128.  | 1693.  | 852.  | 1037.    | -8722.  | 3065.    | -.0022 | -.0006 | -.0004 | -.0041 | .0232  | -.0065 | 3733.  |  |  |
| .3130   | 4086.  | 1734.  | 938.  | 1084.    | -8822.  | 3151.    | -.0022 | -.0006 | -.0004 | -.0043 | .0234  | -.0067 | 3784.  |  |  |
| .3140   | 3761.  | 1677.  | 1089. | 1121.    | -8712.  | 3277.    | -.0020 | -.0006 | -.0004 | -.0044 | .0230  | -.0072 | 3762.  |  |  |
| .3150   | 3155.  | 1614.  | 1216. | 1158.    | -8355.  | 3475.    | -.0018 | -.0006 | -.0005 | -.0045 | .0218  | -.0079 | 3661.  |  |  |
| .3160   | 2312.  | 1586.  | 1277. | 1200.    | -7759.  | 3738.    | -.0013 | -.0006 | -.0005 | -.0046 | .0200  | -.0089 | 3490.  |  |  |
| .3170   | 1342.  | 1533.  | 1326. | 1239.    | -7008.  | 3986.    | -.0009 | -.0006 | -.0005 | -.0047 | .0177  | -.0100 | 3273.  |  |  |
| .3180   | 378.   | 1395.  | 1403. | 1261.    | -6197.  | 4129.    | -.0004 | -.0006 | -.0006 | -.0047 | .0152  | -.0107 | 3031.  |  |  |
| .3190   | -487.  | 1195.  | 1466. | 1247.    | -5368.  | 4134.    | .0000  | -.0006 | -.0006 | -.0045 | .0128  | -.0111 | 2765.  |  |  |

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CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |       |       |       |        |       |         |         |         |         |       |         |       |
|-------|-------|-------|-------|-------|--------|-------|---------|---------|---------|---------|-------|---------|-------|
| .3090 | 2549. | 1294. | 706.  | 846.  | -7135. | 3255. | -0.0014 | -0.0005 | -0.0003 | -0.0031 | .0186 | -0.0075 | 2894. |
| .3100 | 3743. | 1395. | 801.  | 909.  | -7086. | 3093. | -0.0018 | -0.0005 | -0.0003 | -0.0036 | .0208 | -0.0068 | 3417. |
| .3110 | 4882. | 1542. | 836.  | 977.  | -8420. | 3025. | -0.0021 | -0.0006 | -0.0007 | -0.0039 | .0223 | -0.0065 | 3612. |
| .3120 | 4128. | 1693. | 852.  | 1037. | -8722. | 3065. | -0.0022 | -0.0006 | -0.0004 | -0.0041 | .0232 | -0.0065 | 3733. |
| .3130 | 4066. | 1734. | 930.  | 1084. | -8822. | 3151. | -0.0022 | -0.0006 | -0.0004 | -0.0043 | .0234 | -0.0067 | 3784. |
| .3140 | 3761. | 1677. | 1089. | 1121. | -8712. | 3277. | -0.0020 | -0.0006 | -0.0004 | -0.0044 | .0230 | -0.0072 | 3762. |
| .3150 | 3155. | 1614. | 1216. | 1158. | -8355. | 3475. | -0.0018 | -0.0006 | -0.0005 | -0.0045 | .0218 | -0.0079 | 3661. |
| .3160 | 2312. | 1526. | 1277. | 1200. | -7759. | 3738. | -0.0013 | -0.0006 | -0.0005 | -0.0046 | .0200 | -0.0089 | 3490. |
| .3170 | 1342. | 1533. | 1326. | 1239. | -7008. | 3986. | -0.0009 | -0.0006 | -0.0005 | -0.0047 | .0177 | -0.0100 | 3273. |
| .3180 | 378.  | 1395. | 1403. | 1261. | -6197. | 4129. | -0.0004 | -0.0006 | -0.0006 | -0.0047 | .0152 | -0.0107 | 3031. |
| .3190 | -487. | 1195. | 1466. | 1247. | -5368. | 4134. | .0000   | -0.0006 | -0.0006 | -0.0045 | .0128 | -0.0111 | 2765. |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 48     | MEMBER | 2      | SEQUENCE | 67      | LOCATION | END   | TYPE    | EL      |         |         |         |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|-------|---------|---------|---------|---------|---------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX    | DY      | DZ      | RX      | RY      | RZ      | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)  | (IN)    | (IN)    | (DEG)   | (DEG)   | (DEG)   | (PSI)  |  |  |
| .3200   | -1213. | 994.   | 1440.  | 1188.    | -4525.  | 4017.    | .0004 | -0.0005 | -0.0005 | -0.0042 | .0104   | -0.0111 | 2474.  |  |  |
| .3210   | -1759. | 810.   | 1314.  | 1085.    | -3693.  | 3777.    | .0006 | -0.0004 | -0.0005 | -0.0038 | .0081   | -0.0107 | 2164.  |  |  |
| .3220   | -2067. | 617.   | 1134.  | 947.     | -2934.  | 3382.    | .0008 | -0.0003 | -0.0004 | -0.0032 | .0060   | -0.0099 | 1836.  |  |  |
| .3230   | -2107. | 397.   | 938.   | 784.     | -2289.  | 2820.    | .0008 | -0.0003 | -0.0003 | -0.0026 | .0044   | -0.0084 | 1491.  |  |  |
| .3240   | -1919. | 166.   | 727.   | 609.     | -1747.  | 2131.    | .0007 | -0.0002 | -0.0003 | -0.0019 | .0031   | -0.0066 | 1132.  |  |  |
| .3250   | -1597. | -40.   | 479.   | 424.     | -1257.  | 1391.    | .0006 | -0.0001 | -0.0002 | -0.0012 | .0021   | -0.0046 | 771.   |  |  |
| .3260   | -1226. | -208.  | 188.   | 232.     | -781.   | 663.     | .0004 | .0000   | -0.0000 | -0.0005 | .0011   | -0.0026 | 421.   |  |  |
| .3270   | -859.  | -352.  | -120.  | 34.      | -308.   | -21.     | .0003 | .0001   | .0001   | .0002   | .0001   | -0.0007 | 125.   |  |  |
| .3280   | -553.  | -499.  | -403.  | -164.    | 166.    | -630.    | .0001 | .0002   | .0002   | .0010   | -0.0009 | .0010   | 269.   |  |  |
| .3290   | -388.  | -651.  | -634.  | -352.    | 664.    | -1113.   | .0001 | .0003   | .0003   | .0016   | -0.0021 | .0024   | 539.   |  |  |
| .3300   | -434.  | -775.  | -827.  | -517.    | 1219.   | -1413.   | .0001 | .0003   | .0003   | .0022   | -0.0034 | .0032   | 777.   |  |  |
| .3310   | -701.  | -840.  | -997.  | -646.    | 1835.   | -1505.   | .0003 | .0004   | .0004   | .0026   | -0.0050 | .0034   | 987.   |  |  |
| .3320   | -1155. | -856.  | -1126. | -736.    | 2474.   | -1406.   | .0005 | .0004   | .0004   | .0029   | -0.0067 | .0030   | 1180.  |  |  |
| .3330   | -1747. | -854.  | -1180. | -784.    | 3089.   | -1150.   | .0009 | .0005   | .0004   | .0031   | -0.0084 | .0022   | 1360.  |  |  |
| .3340   | -2423. | -838.  | -1159. | -797.    | 3642.   | -767.    | .0012 | .0005   | .0004   | .0031   | -0.0100 | .0010   | 1527.  |  |  |
| .3350   | -3125. | -778.  | -1105. | -779.    | 4110.   | -273.    | .0016 | .0005   | .0003   | .0029   | -0.0114 | -0.0004 | 1682.  |  |  |
| .3360   | -3771. | -657.  | -1043. | -736.    | 4456.   | 291.     | .0020 | .0004   | .0003   | .0027   | -0.0125 | -0.0020 | 1816.  |  |  |
| .3370   | -4276. | -503.  | -955.  | -670.    | 4625.   | 863.     | .0022 | .0004   | .0002   | .0024   | -0.0130 | -0.0036 | 1907.  |  |  |
| .3380   | -4576. | -339.  | -824.  | -585.    | 4580.   | 1391.    | .0024 | .0004   | .0002   | .0020   | -0.0130 | -0.0050 | 1935.  |  |  |
| .3390   | -4643. | -156.  | -669.  | -480.    | 4321.   | 1852.    | .0024 | .0003   | .0001   | .0016   | -0.0123 | -0.0061 | 1896.  |  |  |
| .3400   | -4476. | 61.    | -521.  | -360.    | 3869.   | 2239.    | .0024 | .0002   | .0000   | .0011   | -0.0111 | -0.0070 | 1800.  |  |  |
| .3410   | -4101. | 306.   | -386.  | -230.    | 3256.   | 2546.    | .0022 | .0001   | -0.0000 | .0005   | -0.0094 | -0.0076 | 1661.  |  |  |
| .3420   | -3560. | 549.   | -250.  | -97.     | 2514.   | 2769.    | .0020 | .0000   | -0.0001 | -0.0000 | -0.0073 | -0.0079 | 1501.  |  |  |
| .3430   | -2909. | 765.   | -99.   | 32.      | 1687.   | 2909.    | .0016 | -0.0000 | -0.0002 | -0.0006 | -0.0050 | -0.0080 | 1350.  |  |  |
| .3440   | -2221. | 948.   | 57.    | 152.     | 839.    | 2989.    | .0013 | -0.0001 | -0.0002 | -0.0010 | -0.0026 | -0.0079 | 1247.  |  |  |
| .3450   | -1591. | 1114.  | 195.   | 262.     | 49.     | 3051.    | .0010 | -0.0002 | -0.0003 | -0.0015 | -0.0003 | -0.0079 | 1229.  |  |  |
| .3460   | -1100. | 1260.  | 312.   | 362.     | -621.   | 3124.    | .0007 | -0.0003 | -0.0003 | -0.0019 | .0015   | -0.0079 | 1286.  |  |  |
| .3470   | -788.  | 1361.  | 431.   | 452.     | -1142.  | 3209.    | .0006 | -0.0003 | -0.0003 | -0.0022 | .0029   | -0.0080 | 1379.  |  |  |
| .3480   | -663.  | 1399.  | 570.   | 533.     | -1507.  | 3299.    | .0005 | -0.0004 | -0.0004 | -0.0025 | .0038   | -0.0082 | 1471.  |  |  |
| .3490   | -732.  | 1390.  | 708.   | 602.     | -1695.  | 3401.    | .0005 | -0.0004 | -0.0004 | -0.0028 | .0042   | -0.0085 | 1544.  |  |  |
| .3500   | -988.  | 1358.  | 817.   | 656.     | -1692.  | 3523.    | .0006 | -0.0004 | -0.0004 | -0.0029 | .0041   | -0.0090 | 1590.  |  |  |
| .3510   | -1389. | 1307.  | 887.   | 687.     | -1519.  | 3650.    | .0008 | -0.0004 | -0.0005 | -0.0030 | .0034   | -0.0095 | 1610.  |  |  |
| .3520   | -1856. | 1219.  | 930.   | 691.     | -1226.  | 3739.    | .0010 | -0.0004 | -0.0005 | -0.0030 | .0025   | -0.0099 | 1603.  |  |  |
| .3530   | -2293. | 1082.  | 961.   | 666.     | -875.   | 3742.    | .0012 | -0.0004 | -0.0005 | -0.0028 | .0014   | -0.0102 | 1565.  |  |  |
| .3540   | -2637. | 925.   | 959.   | 615.     | -498.   | 3647.    | .0013 | -0.0003 | -0.0004 | -0.0026 | .0003   | -0.0101 | 1497.  |  |  |
| .3550   | -2856. | 793.   | 832.   | 543.     | -100.   | 3466.    | .0015 | -0.0003 | -0.0004 | -0.0023 | -0.0008 | -0.0097 | 1408.  |  |  |
| .3560   | -2923. | 697.   | 729.   | 451.     | 297.    | 3196.    | .0015 | -0.0002 | -0.0004 | -0.0019 | -0.0018 | -0.0091 | 1301.  |  |  |
| .3570   | -2808. | 599.   | 541.   | 339.     | 653.    | 2816.    | .0015 | -0.0002 | -0.0003 | -0.0015 | -0.0026 | -0.0080 | 1168.  |  |  |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

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PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |       |      |      |        |       |       |        |        |        |        |        |       |
|-------|--------|-------|------|------|--------|-------|-------|--------|--------|--------|--------|--------|-------|
| .3470 | -788.  | 1361. | 431. | 452. | -1142. | 3209. | .0006 | -.0003 | -.0003 | -.0022 | .0029  | -.0080 | 1379. |
| .3480 | -665.  | 1399. | 570. | 533. | -1507. | 3299. | .0005 | -.0004 | -.0004 | -.0025 | .0038  | -.0082 | 1471. |
| .3490 | -732.  | 1390. | 708. | 602. | -1695. | 3401. | .0005 | -.0004 | -.0004 | -.0028 | .0042  | -.0085 | 1544. |
| .3500 | -988.  | 1358. | 817. | 656. | -1692. | 3523. | .0006 | -.0004 | -.0004 | -.0029 | .0041  | -.0090 | 1590. |
| .3510 | -1369. | 1307. | 887. | 687. | -1519. | 3650. | .0008 | -.0004 | -.0005 | -.0030 | .0034  | -.0095 | 1610. |
| .3520 | -1856. | 1219. | 930. | 691. | -1226. | 3739. | .0010 | -.0004 | -.0005 | -.0030 | .0025  | -.0099 | 1603. |
| .3530 | -2293. | 1082. | 961. | 666. | -875.  | 3742. | .0012 | -.0004 | -.0005 | -.0028 | .0014  | -.0102 | 1565. |
| .3540 | -2637. | 925.  | 959. | 615. | -498.  | 3647. | .0013 | -.0003 | -.0004 | -.0026 | .0003  | -.0101 | 1497. |
| .3550 | -2856. | 793.  | 882. | 543. | -100.  | 3466. | .0015 | -.0003 | -.0004 | -.0023 | -.0008 | -.0097 | 1408. |
| .3560 | -2923. | 697.  | 729. | 451. | 297.   | 3196. | .0015 | -.0002 | -.0004 | -.0019 | -.0018 | -.0091 | 1301. |
| .3570 | -2808. | 599.  | 541. | 339. | 653.   | 2816. | .0015 | -.0002 | -.0003 | -.0015 | -.0026 | -.0080 | 1168. |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
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CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION    | MEMBER  | SEQUENCE | LOCATION | END        | TYPE       | EL         |         |         |         |          |          |          |              |  |  |
|------------|---------|----------|----------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|--|--|
| TIME (SEC) | FX (LB) | FY (LB)  | FZ (LB)  | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |  |  |
| .3580      | -2504.  | 473.     | 352.     | 207.       | 945.       | 2316.      | .0013   | -.0001  | -.0002  | -.0010   | -.0032   | -.0066   | 1007.        |  |  |
| .3590      | -2052.  | 339.     | 145.     | 58.        | 1197.      | 1733.      | .0011   | -.0000  | -.0001  | -.0005   | -.0036   | -.0049   | 846.         |  |  |
| .3600      | -1526.  | 238.     | -112.    | -107.      | 1460.      | 1127.      | .0009   | .0000   | -.0000  | .0001    | -.0040   | -.0031   | 741.         |  |  |
| .3610      | -1004.  | 174.     | -419.    | -280.      | 1767.      | 543.       | .0007   | .0001   | .0001   | .0007    | -.0045   | -.0014   | 750.         |  |  |
| .3620      | -535.   | 110.     | -719.    | -455.      | 2122.      | -6.        | .0005   | .0002   | .0001   | .0014    | -.0051   | .0003    | 871.         |  |  |
| .3630      | -157.   | 10.      | -965.    | -624.      | 2520.      | -513.      | .0003   | .0002   | .0002   | .0020    | -.0058   | .0018    | 1062.        |  |  |
| .3640      | 83.     | -106.    | -1169.   | -783.      | 2986.      | -943.      | .0002   | .0003   | .0003   | .0025    | -.0068   | .0030    | 1295.        |  |  |
| .3650      | 138.    | -194.    | -1376.   | -931.      | 3555.      | -1250.     | .0003   | .0004   | .0004   | .0030    | -.0081   | .0039    | 1558.        |  |  |
| .3660      | -11.    | -247.    | -1597.   | -1070.     | 4234.      | -1418.     | .0004   | .0004   | .0004   | .0035    | -.0098   | .0044    | 1843.        |  |  |
| .3670      | -330.   | -310.    | -1775.   | -1202.     | 4976.      | -1479.     | .0006   | .0005   | .0005   | .0040    | -.0117   | .0045    | 2138.        |  |  |
| .3680      | -753.   | -421.    | -1880.   | -1326.     | 5718.      | -1479.     | .0008   | .0005   | .0005   | .0044    | -.0136   | .0045    | 2429.        |  |  |
| .3690      | -1220.  | -552.    | -1932.   | -1441.     | 6426.      | -1434.     | .0011   | .0006   | .0005   | .0047    | -.0155   | .0042    | 2705.        |  |  |
| .3700      | -1689.  | -640.    | -1992.   | -1543.     | 7089.      | -1334.     | .0014   | .0006   | .0006   | .0051    | -.0173   | .0039    | 2960.        |  |  |
| .3710      | -2118.  | -664.    | -2078.   | -1630.     | 7682.      | -1187.     | .0016   | .0007   | .0006   | .0053    | -.0189   | .0034    | 3187.        |  |  |
| .3720      | -2431.  | -671.    | -2143.   | -1704.     | 8137.      | -1049.     | .0018   | .0007   | .0006   | .0055    | -.0201   | .0030    | 3363.        |  |  |
| .3730      | -2547.  | -712.    | -2138.   | -1769.     | 8384.      | -982.      | .0019   | .0007   | .0006   | .0057    | -.0207   | .0029    | 3461.        |  |  |
| .3740      | -2443.  | -759.    | -2098.   | -1830.     | 8419.      | -985.      | .0019   | .0007   | .0006   | .0058    | -.0207   | .0030    | 3480.        |  |  |
| .3750      | -2157.  | -748.    | -2089.   | -1883.     | 8289.      | -1011.     | .0017   | .0007   | .0006   | .0059    | -.0202   | .0032    | 3435.        |  |  |
| .3760      | -1738.  | -659.    | -2123.   | -1922.     | 8027.      | -1027.     | .0016   | .0007   | .0006   | .0059    | -.0193   | .0035    | 3338.        |  |  |
| .3770      | -1262.  | -548.    | -2135.   | -1941.     | 7620.      | -1055.     | .0013   | .0007   | .0006   | .0059    | -.0181   | .0038    | 3184.        |  |  |
| .3780      | -540.   | -487.    | -2050.   | -1938.     | 7041.      | -1135.     | .0010   | .0007   | .0006   | .0058    | -.0163   | .0043    | 2966.        |  |  |
| .3790      | 210.    | -467.    | -1885.   | -1917.     | 6325.      | -1250.     | .0006   | .0006   | .0006   | .0056    | -.0142   | .0048    | 2699.        |  |  |
| .3800      | 966.    | -412.    | -1729.   | -1881.     | 5559.      | -1334.     | .0002   | .0006   | .0006   | .0053    | -.0120   | .0054    | 2415.        |  |  |
| .3810      | 1639.   | -257.    | -1657.   | -1829.     | 4834.      | -1323.     | -.0001  | .0005   | .0006   | .0051    | -.0099   | .0056    | 2141.        |  |  |
| .3820      | 2209.   | -69.     | -1599.   | -1757.     | 4145.      | -1245.     | -.0004  | .0004   | .0005   | .0047    | -.0080   | .0056    | 1874.        |  |  |
| .3830      | 2710.   | 42.      | -1441.   | -1665.     | 3438.      | -1175.     | -.0006  | .0004   | .0005   | .0043    | -.0060   | .0056    | 1604.        |  |  |
| .3840      | 3132.   | 90.      | -1203.   | -1554.     | 2734.      | -1110.     | -.0009  | .0003   | .0004   | .0039    | -.0042   | .0056    | 1338.        |  |  |
| .3850      | 3418.   | 171.     | -993.    | -1426.     | 2115.      | -991.      | -.0010  | .0003   | .0004   | .0034    | -.0026   | .0053    | 1098.        |  |  |
| .3860      | 3529.   | 318.     | -856.    | -1284.     | 1630.      | -789.      | -.0011  | .0002   | .0003   | .0029    | -.0013   | .0048    | 891.         |  |  |
| .3870      | 3515.   | 449.     | -720.    | -1137.     | 1230.      | -575.      | -.0011  | .0001   | .0003   | .0025    | -.0004   | .0042    | 711.         |  |  |
| .3880      | 3474.   | 475.     | -505.    | -989.      | 835.       | -444.      | -.0012  | .0001   | .0002   | .0020    | .0005    | .0038    | 549.         |  |  |
| .3890      | 3455.   | 422.     | -249.    | -845.      | 439.       | -415.      | -.0012  | .0000   | .0002   | .0016    | .0014    | .0036    | 417.         |  |  |
| .3900      | 3441.   | 388.     | -52.     | -703.      | 94.        | -441.      | -.0013  | -.0000  | .0001   | .0012    | .0021    | .0035    | 335.         |  |  |
| .3910      | 3427.   | 409.     | 48.      | -562.      | -178.      | -507.      | -.0013  | -.0001  | .0001   | .0008    | .0027    | .0036    | 312.         |  |  |
| .3920      | 3476.   | 416.     | 121.     | -425.      | -437.      | -674.      | -.0014  | -.0001  | .0000   | .0005    | .0032    | .0039    | 365.         |  |  |
| .3930      | 3661.   | 324.     | 245.     | -302.      | -749.      | -1016.     | -.0015  | -.0001  | .0000   | .0002    | .0040    | .0047    | 521.         |  |  |
| .3940      | 3968.   | 153.     | 389.     | -202.      | -1093.     | -1513.     | -.0017  | -.0001  | .0000   | .0000    | .0048    | .0059    | 753.         |  |  |
| .3950      | 4317.   | -8.      | 459.     | -128.      | -1385.     | -2082.     | -.0020  | -.0001  | .0000   | -.0000   | .0055    | .0073    | 1005.        |  |  |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |       |      |       |        |        |        |        |        |       |        |        |       |       |
|-------|-------|------|-------|--------|--------|--------|--------|--------|-------|--------|--------|-------|-------|
| .3850 | 3418. | 171. | -993. | -1426. | 2115.  | -991.  | -.0010 | .0003  | .0004 | .0034  | -.0026 | .0053 | 1098. |
| .3860 | 3529. | 318. | -856. | -1284. | 1630.  | -789.  | -.0011 | .0002  | .0003 | .0029  | -.0013 | .0048 | 891.  |
| .3870 | 3515. | 449. | -720. | -1177. | 1230.  | -575.  | -.0011 | .0001  | .0003 | .0025  | -.0004 | .0042 | 711.  |
| .3880 | 3474. | 475. | -505. | -989.  | 835.   | -444.  | -.0012 | .0001  | .0002 | .0020  | .0005  | .0038 | 549.  |
| .3890 | 3455. | 422. | -249. | -845.  | 439.   | -415.  | -.0012 | .0000  | .0002 | .0016  | .0014  | .0036 | 417.  |
| .3900 | 3441. | 388. | -52.  | -703.  | 94.    | -441.  | -.0013 | -.0000 | .0001 | .0012  | .0021  | .0035 | 335.  |
| .3910 | 3427. | 409. | 48.   | -562.  | -178.  | -507.  | -.0013 | -.0001 | .0001 | .0008  | .0027  | .0036 | 312.  |
| .3920 | 3476. | 416. | 121.  | -425.  | -437.  | -674.  | -.0014 | -.0001 | .0000 | .0005  | .0032  | .0039 | 365.  |
| .3930 | 3661. | 324. | 245.  | -302.  | -749.  | -1016. | -.0015 | -.0001 | .0000 | .0002  | .0040  | .0047 | 521.  |
| .3940 | 3968. | 153. | 389.  | -202.  | -1093. | -1513. | -.0017 | -.0001 | .0000 | .0000  | .0048  | .0059 | 753.  |
| .3950 | 4317. | -8.  | 459.  | -128.  | -1385. | -2082. | -.0020 | -.0001 | .0000 | -.0000 | .0055  | .0073 | 1005. |

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INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION    | MEMBER  | SEQUENCE | LOCATION | END        | TYPE       | EL         |         |         |         |          |          |          | STRESS |
|------------|---------|----------|----------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------|
| TIME (SEC) | FX (LB) | FY (LB)  | FZ (LB)  | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | (PSI)  |
| .3960      | 4651.   | -119.    | 417.     | -78.       | -1578.     | -2672.     | -.0022  | -.0001  | .0000   | -.0000   | .0060    | .0088    | 1246.  |
| .3970      | 4979.   | -243.    | 345.     | -44.       | -1707.     | -3306.     | -.0024  | -.0001  | .0001   | .0001    | .0063    | .0104    | 1493.  |
| .3980      | 5307.   | -453.    | 337.     | -19.       | -1812.     | -4011.     | -.0026  | -.0001  | .0001   | .0002    | .0066    | .0122    | 1766.  |
| .3990      | 5573.   | -720.    | 373.     | -1.        | -1854.     | -4733.     | -.0028  | -.0001  | .0001   | .0003    | .0067    | .0139    | 2040.  |
| .4000      | 5684.   | -948.    | 360.     | 10.        | -1748.     | -5372.     | -.0030  | -.0000  | .0002   | .0005    | .0063    | .0155    | 2267.  |

MAXIMUM VALUE OF STRESS OCCURS AT

| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| .3130      | 4086.   | 1734.   | 938.    | 1084.      | -8822.     | 3151.      | -.0022  | -.0006  | -.0004  | -.0043   | .0234    | -.0067   | 3784.        |

| SECTION    | MEMBER  | SEQUENCE | LOCATION | BEG        | TYPE       | RU         |         |         |         |          |          |          | STRESS |
|------------|---------|----------|----------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------|
| TIME (SEC) | FX (LB) | FY (LB)  | FZ (LB)  | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | (PSI)  |
| 0.0000     | 0.      | 0.       | 0.       | 0.         | 0.         | 0.         | 0.0000  | 0.0000  | 0.0000  | 0.0000   | 0.0000   | 0.0000   | 0.     |
| .0010      | -0.     | 0.       | -0.      | 0.         | 0.         | 0.         | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 0.     |
| .0020      | -1.     | 0.       | -0.      | 0.         | 1.         | 1.         | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 0.     |
| .0030      | -3.     | 1.       | -0.      | 0.         | 2.         | 1.         | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 1.     |
| .0040      | -5.     | 1.       | -1.      | 0.         | 3.         | 3.         | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 2.     |
| .0050      | -8.     | 1.       | -0.      | 0.         | 5.         | 4.         | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 3.     |
| .0060      | -12.    | 1.       | 0.       | 1.         | 7.         | 6.         | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 4.     |
| .0070      | -15.    | -0.      | 1.       | 1.         | 9.         | 8.         | -.0000  | -.0000  | .0000   | .0000    | .0000    | .0000    | 5.     |
| .0080      | -15.    | -2.      | 3.       | 0.         | 8.         | 7.         | -.0000  | -.0000  | .0000   | .0000    | .0000    | .0000    | 4.     |
| .0090      | -11.    | -4.      | 5.       | -1.        | 5.         | 5.         | -.0000  | -.0000  | .0000   | -.0000   | .0000    | .0000    | 3.     |
| .0100      | -5.     | -4.      | 3.       | -1.        | 3.         | 2.         | -.0000  | -.0000  | -.0000  | -.0000   | .0000    | .0000    | 2.     |
| .0110      | -1.     | -1.      | -2.      | -1.        | 2.         | 1.         | -.0000  | -.0000  | -.0000  | -.0000   | .0000    | .0000    | 1.     |
| .0120      | 3.      | 2.       | -6.      | 1.         | 1.         | -0.        | .0000   | -.0000  | -.0000  | -.0000   | .0000    | -.0000   | 1.     |
| .0130      | 9.      | 3.       | -5.      | 5.         | -2.        | -4.        | .0000   | .0000   | -.0000  | .0000    | -.0000   | -.0000   | 3.     |
| .0140      | 16.     | 2.       | -2.      | 10.        | -6.        | -9.        | .0000   | .0000   | .0000   | .0000    | -.0000   | -.0000   | 6.     |
| .0150      | 17.     | 2.       | -1.      | 15.        | -7.        | -11.       | .0000   | .0000   | .0000   | .0000    | -.0000   | -.0000   | 8.     |
| .0160      | 11.     | 6.       | -3.      | 20.        | -2.        | -9.        | .0000   | .0000   | .0000   | .0000    | -.0000   | -.0000   | 9.     |
| .0170      | -0.     | 9.       | -7.      | 23.        | 7.         | -3.        | -.0000  | .0000   | .0000   | .0000    | .0000    | -.0000   | 10.    |
| .0180      | -13.    | 9.       | -7.      | 26.        | 15.        | 2.         | -.0000  | .0000   | .0000   | .0001    | .0000    | .0000    | 12.    |
| .0190      | -24.    | 5.       | -2.      | 30.        | 20.        | 4.         | -.0000  | .0000   | .0000   | .0001    | .0001    | .0000    | 14.    |

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CONDITION 24  
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INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |      |     |     |     |     |      |         |         |         |         |         |         |         |     |
|-------|------|-----|-----|-----|-----|------|---------|---------|---------|---------|---------|---------|---------|-----|
| .0090 | -11. | -4. | 5.  | -1. | 5.  | 5.   | -0.0000 | -0.0000 | .0000   | -0.0000 | .0000   | .0000   | .0000   | 4.  |
| .0100 | -5.  | -4. | 3.  | -1. | 3.  | 2.   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | .0000   | .0000   | .0000   | 3.  |
| .0110 | -1.  | -1. | -2. | -1. | 2.  | 1.   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | .0000   | .0000   | .0000   | 2.  |
| .0120 | 3.   | 2.  | -6. | 1.  | 1.  | -0.  | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | -0.0000 | -0.0000 | 1.  |
| .0130 | 9.   | 3.  | -5. | 5.  | -2. | -4.  | .0000   | .0000   | -0.0000 | .0000   | -0.0000 | -0.0000 | -0.0000 | 3.  |
| .0140 | 16.  | 2.  | -2. | 10. | -6. | -9.  | .0000   | .0000   | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | 6.  |
| .0150 | 17.  | 2.  | -1. | 15. | -7. | -11. | .0000   | .0000   | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | 8.  |
| .0160 | 11.  | 6.  | -3. | 20. | -2. | -9.  | .0000   | .0000   | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | 9.  |
| .0170 | -0.  | 9.  | -7. | 23. | 7.  | -3.  | -0.0000 | .0000   | .0000   | .0000   | .0000   | .0000   | -0.0000 | 10. |
| .0180 | -13. | 9.  | -7. | 26. | 15. | 2.   | -0.0000 | .0000   | .0000   | .0001   | .0000   | .0000   | .0000   | 12. |
| .0190 | -24. | 5.  | -2. | 30. | 20. | 4.   | -0.0000 | .0000   | .0000   | .0001   | .0001   | .0000   | .0000   | 14. |

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CONDITION 24  
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INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | BEG   | TYPE  | RU    | TIME    | FX      | FY      | FZ      | MX      | MY      | MZ      | DX   | DY   | DZ   | RX    | RY    | RZ    | STRESS |
|---------|--------|----------|----------|-------|-------|-------|---------|---------|---------|---------|---------|---------|---------|------|------|------|-------|-------|-------|--------|
| 49      | 1      | 67       |          |       |       |       | (SEC)   | (LB)    | (LB)    | (LB)    | (FT-LB) | (FT-LB) | (FT-LB) | (IN) | (IN) | (IN) | (DEG) | (DEG) | (DEG) | (PSI)  |
| .0200   | -36.   | -2.      | 6.       | 34.   | 24.   | 6.    | -0.0000 | .0000   | .0000   | .0001   | .0001   | .0000   | .0000   | 17.  |      |      |       |       |       |        |
| .0210   | -51.   | -5.      | 11.      | 40.   | 32.   | 10.   | -0.0000 | .0000   | .0000   | .0001   | .0001   | .0000   | .0000   | 21.  |      |      |       |       |       |        |
| .0220   | -64.   | -2.      | 9.       | 48.   | 41.   | 13.   | -0.0000 | .0000   | .0000   | .0001   | .0001   | .0001   | .0001   | 26.  |      |      |       |       |       |        |
| .0230   | -64.   | 1.       | 5.       | 57.   | 44.   | 11.   | -0.0000 | .0000   | .0000   | .0001   | .0001   | .0001   | .0001   | 29.  |      |      |       |       |       |        |
| .0240   | -49.   | 5.       | 6.       | 65.   | 38.   | 3.    | -0.0000 | .0000   | .0000   | .0001   | .0001   | .0000   | .0000   | 30.  |      |      |       |       |       |        |
| .0250   | -31.   | 7.       | 12.      | 67.   | 24.   | -5.   | -0.0000 | .0000   | .0000   | .0001   | .0001   | .0000   | .0000   | 29.  |      |      |       |       |       |        |
| .0260   | -17.   | 0.       | 18.      | 60.   | 12.   | -14.  | -0.0000 | .0000   | .0000   | .0001   | .0000   | -0.0000 | -0.0000 | 25.  |      |      |       |       |       |        |
| .0270   | 1.     | -8.      | 6.       | 47.   | 5.    | -26.  | .0000   | .0000   | .0000   | .0001   | .0000   | -0.0001 | -0.0001 | 22.  |      |      |       |       |       |        |
| .0280   | 29.    | -5.      | -18.     | 34.   | -1.   | -37.  | .0000   | .0000   | .0000   | .0000   | -0.0000 | -0.0001 | -0.0001 | 20.  |      |      |       |       |       |        |
| .0290   | 55.    | 2.       | -24.     | 26.   | -16.  | -45.  | .0000   | .0000   | -0.0000 | .0000   | -0.0001 | -0.0001 | -0.0001 | 22.  |      |      |       |       |       |        |
| .0300   | 90.    | 5.       | -18.     | 24.   | -40.  | -59.  | .0000   | .0000   | -0.0000 | .0000   | -0.0001 | -0.0002 | -0.0002 | 30.  |      |      |       |       |       |        |
| .0310   | 152.   | 20.      | -32.     | 23.   | -66.  | -83.  | .0001   | .0000   | -0.0000 | .0000   | -0.0002 | -0.0003 | -0.0003 | 44.  |      |      |       |       |       |        |
| .0320   | 215.   | 25.      | -36.     | 15.   | -95.  | -108. | .0001   | .0000   | -0.0000 | .0000   | -0.0003 | -0.0004 | -0.0004 | 58.  |      |      |       |       |       |        |
| .0330   | 231.   | 3.       | -15.     | -4.   | -113. | -119. | .0001   | .0000   | -0.0000 | .0000   | -0.0004 | -0.0004 | -0.0004 | 66.  |      |      |       |       |       |        |
| .0340   | 205.   | -6.      | -21.     | -34.  | -101. | -105. | .0001   | -0.0000 | -0.0000 | -0.0001 | -0.0003 | -0.0003 | -0.0003 | 60.  |      |      |       |       |       |        |
| .0350   | 192.   | 26.      | -76.     | -72.  | -77.  | -77.  | .0001   | -0.0000 | -0.0000 | -0.0002 | -0.0003 | -0.0003 | -0.0003 | 52.  |      |      |       |       |       |        |
| .0360   | 230.   | 47.      | -115.    | -110. | -85.  | -76.  | .0001   | -0.0000 | -0.0000 | -0.0003 | -0.0003 | -0.0003 | -0.0003 | 64.  |      |      |       |       |       |        |
| .0370   | 295.   | 1.       | -83.     | -141. | -129. | -115. | .0001   | -0.0000 | -0.0000 | -0.0003 | -0.0005 | -0.0004 | -0.0004 | 89.  |      |      |       |       |       |        |
| .0380   | 317.   | -56.     | -35.     | -158. | -155. | -141. | .0001   | -0.0000 | -0.0000 | -0.0004 | -0.0005 | -0.0005 | -0.0005 | 105. |      |      |       |       |       |        |
| .0390   | 262.   | -30.     | -47.     | -160. | -121. | -99.  | .0001   | -0.0000 | -0.0000 | -0.0004 | -0.0004 | -0.0004 | -0.0004 | 90.  |      |      |       |       |       |        |
| .0400   | 175.   | 57.      | -98.     | -155. | -62.  | -14.  | .0001   | -0.0000 | -0.0000 | -0.0003 | -0.0003 | -0.0001 | -0.0001 | 67.  |      |      |       |       |       |        |
| .0410   | 138.   | 95.      | -107.    | -158. | -45.  | 29.   | .0001   | -0.0000 | -0.0000 | -0.0003 | -0.0002 | -0.0000 | -0.0000 | 67.  |      |      |       |       |       |        |
| .0420   | 174.   | 42.      | -55.     | -181. | -85.  | 4.    | .0001   | -0.0000 | -0.0000 | -0.0004 | -0.0003 | -0.0001 | -0.0001 | 80.  |      |      |       |       |       |        |
| .0430   | 221.   | -18.     | -18.     | -217. | -122. | -27.  | .0001   | -0.0000 | -0.0000 | -0.0004 | -0.0004 | -0.0002 | -0.0002 | 101. |      |      |       |       |       |        |
| .0440   | 163.   | -40.     | -23.     | -251. | -94.  | 4.    | .0001   | -0.0000 | -0.0001 | -0.0005 | -0.0003 | -0.0001 | -0.0001 | 108. |      |      |       |       |       |        |
| .0450   | -10.   | -17.     | -54.     | -260. | -2.   | 100.  | -0.0000 | -0.0000 | -0.0000 | -0.0006 | -0.0000 | .0002   | .0002   | 112. |      |      |       |       |       |        |
| .0460   | -148.  | 54.      | -96.     | -235. | 78.   | 193.  | -0.0001 | -0.0000 | -0.0000 | -0.0005 | .0002   | .0005   | .0005   | 126. |      |      |       |       |       |        |
| .0470   | -131.  | 108.     | -83.     | -186. | 65.   | 207.  | -0.0001 | -0.0000 | -0.0000 | -0.0003 | .0002   | .0005   | .0005   | 115. |      |      |       |       |       |        |
| .0480   | -50.   | 52.      | 43.      | -138. | -17.  | 148.  | -0.0000 | -0.0000 | -0.0000 | -0.0002 | -0.0000 | .0004   | .0004   | 82.  |      |      |       |       |       |        |
| .0490   | -101.  | -51.     | 173.     | -111. | -37.  | 125.  | -0.0000 | -0.0000 | .0000   | -0.0001 | -0.0000 | .0004   | .0004   | 69.  |      |      |       |       |       |        |
| .0500   | -309.  | -28.     | 123.     | -103. | 86.   | 217.  | -0.0001 | -0.0000 | .0000   | -0.0001 | .0004   | .0007   | .0007   | 102. |      |      |       |       |       |        |
| .0510   | -492.  | 108.     | -59.     | -97.  | 249.  | 339.  | -0.0002 | -0.0000 | .0000   | -0.0002 | .0008   | .0010   | .0010   | 173. |      |      |       |       |       |        |
| .0520   | -510.  | 127.     | -94.     | -72.  | 280.  | 332.  | -0.0003 | -0.0000 | .0000   | -0.0001 | .0009   | .0010   | .0010   | 177. |      |      |       |       |       |        |
| .0530   | -418.  | -38.     | 102.     | -19.  | 175.  | 195.  | -0.0002 | -0.0000 | .0000   | .0000   | .0006   | .0007   | .0007   | 105. |      |      |       |       |       |        |
| .0540   | -364.  | -137.    | 249.     | 54.   | 107.  | 93.   | -0.0002 | .0000   | .0000   | .0002   | .0005   | .0004   | .0004   | 61.  |      |      |       |       |       |        |
| .0550   | -425.  | -17.     | 156.     | 126.  | 186.  | 127.  | -0.0002 | .0000   | .0001   | .0003   | .0007   | .0005   | .0005   | 104. |      |      |       |       |       |        |
| .0560   | -554.  | 118.     | 14.      | 174.  | 315.  | 198.  | -0.0003 | .0000   | .0001   | .0004   | .0010   | .0007   | .0007   | 165. |      |      |       |       |       |        |
| .0570   | -609.  | 63.      | 34.      | 189.  | 344.  | 157.  | -0.0003 | .0000   | .0001   | .0004   | .0011   | .0007   | .0007   | 170. |      |      |       |       |       |        |

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18.29.01.

S/RV PIPING KEAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |       |      |       |      |      |         |         |         |         |         |       |      |
|-------|-------|-------|------|-------|------|------|---------|---------|---------|---------|---------|-------|------|
| .0470 | -131. | 108.  | -83. | -186. | 65.  | 207. | -0.0001 | -0.0000 | -0.0000 | -0.0003 | .0002   | .0005 | 115. |
| .0480 | -50.  | 52.   | 43.  | -138. | -17. | 148. | -0.0000 | -0.0000 | -0.0000 | -0.0002 | -0.0000 | .0004 | 82.  |
| .0490 | -101. | -51.  | 175. | -111. | -37. | 125. | -0.0000 | -0.0000 | -0.0000 | -0.0001 | -0.0000 | .0004 | 69.  |
| .0500 | -309. | -28.  | 123. | -103. | 86.  | 217. | -0.0001 | -0.0000 | .0000   | -0.0001 | .0004   | .0007 | 102. |
| .0510 | -492. | 101.  | -59. | -97.  | 249. | 339. | -0.0002 | -0.0000 | .0000   | -0.0002 | .0008   | .0010 | 173. |
| .0520 | -510. | 127.  | -94. | -72.  | 280. | 332. | -0.0003 | -0.0000 | .0000   | -0.0001 | .0009   | .0010 | 177. |
| .0530 | -418. | -38.  | 102. | -19.  | 175. | 195. | -0.0002 | -0.0000 | .0000   | .0000   | .0006   | .0007 | 105. |
| .0540 | -364. | -137. | 249. | 54.   | 107. | 93.  | -0.0002 | .0000   | .0000   | .0002   | .0005   | .0004 | 61.  |
| .0550 | -425. | -17.  | 156. | 126.  | 186. | 127. | -0.0002 | .0000   | .0001   | .0003   | .0007   | .0005 | 104. |
| .0560 | -554. | 118.  | 14.  | 174.  | 315. | 198. | -0.0003 | .0000   | .0001   | .0004   | .0010   | .0007 | 165. |
| .0570 | -609. | 63.   | 34.  | 189.  | 344. | 157. | -0.0003 | .0000   | .0001   | .0004   | .0011   | .0007 | 170. |

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CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49    | MEMBER | 1     | SEQUENCE | 67      | LOCATION | BEG     | TYPE    | RU      |         |         |         |       |        |  |
|---------|-------|--------|-------|----------|---------|----------|---------|---------|---------|---------|---------|---------|-------|--------|--|
| TIME    | FX    | FY     | FZ    | MX       | MY      | MZ       |         |         |         | DZ      | PX      | RY      | RZ    | STRESS |  |
| (SEC)   | (LB)  | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)    | (IN)    | (IN)    | (IN)    | (DEG)   | (DEG)   | (DEG) | (PSI)  |  |
| .0580   | -489. | -77.   | 113.  | 183.     | 267.    | 3.       | -0.0002 | .0000   | .0000   | .0004   | .0009   | .0003   | 130.  |        |  |
| .0590   | -276. | -130.  | 94.   | 177.     | 184.    | -159.    | -0.0001 | .0000   | .0000   | .0003   | .0006   | -0.0002 | 121.  |        |  |
| .0600   | -166. | -122.  | 32.   | 188.     | 165.    | -252.    | -0.0000 | .0000   | .0000   | .0003   | .0006   | -0.0005 | 143.  |        |  |
| .0610   | -186. | -110.  | 4.    | 222.     | 192.    | -288.    | -0.0000 | .0000   | .0000   | .0003   | .0006   | -0.0006 | 165.  |        |  |
| .0620   | -152. | -61.   | -40.  | 268.     | 198.    | -328.    | -0.0000 | .0000   | .0000   | .0004   | .0006   | -0.0007 | 187.  |        |  |
| .0630   | 41.   | -16.   | -82.  | 299.     | 125.    | -430.    | .0001   | .0000   | .0000   | .0005   | .0004   | -0.0010 | 216.  |        |  |
| .0640   | 276.  | -83.   | -31.  | 290.     | -12.    | -582.    | .0002   | .0000   | .0000   | .0005   | -0.0001 | -0.0015 | 261.  |        |  |
| .0650   | 419.  | -192.  | 21.   | 235.     | -116.   | -697.    | .0003   | .0000   | .0000   | .0003   | -0.0003 | -0.0018 | 299.  |        |  |
| .0660   | 502.  | -168.  | -102. | 152.     | -130.   | -718.    | .0003   | -0.0000 | -0.0000 | .0001   | -0.0004 | -0.0019 | 299.  |        |  |
| .0670   | 609.  | -74.   | -291. | 75.      | -130.   | -709.    | .0003   | -0.0000 | -0.0001 | -0.0001 | -0.0005 | -0.0020 | 291.  |        |  |
| .0680   | 742.  | -105.  | -288. | 30.      | -217.   | -752.    | .0004   | -0.0000 | -0.0001 | -0.0002 | -0.0008 | -0.0021 | 314.  |        |  |
| .0690   | 862.  | -204.  | -135. | 26.      | -357.   | -805.    | .0005   | -0.0000 | -0.0001 | -0.0002 | -0.0012 | -0.0023 | 353.  |        |  |
| .0700   | 940.  | -150.  | -98.  | 41.      | -437.   | -762.    | .0005   | -0.0000 | -0.0001 | -0.0001 | -0.0014 | -0.0022 | 353.  |        |  |
| .0710   | 949.  | 24.    | -194. | 39.      | -439.   | -622.    | .0005   | .0000   | -0.0000 | -0.0000 | -0.0015 | -0.0019 | 306.  |        |  |
| .0720   | 897.  | 84.    | -220. | -9.      | -442.   | -486.    | .0004   | .0000   | -0.0000 | -0.0001 | -0.0015 | -0.0016 | 264.  |        |  |
| .0730   | 842.  | -6.    | -141. | -96.     | -482.   | -395.    | .0004   | -0.0000 | -0.0001 | -0.0003 | -0.0015 | -0.0013 | 253.  |        |  |
| .0740   | 789.  | -62.   | -104. | -188.    | -504.   | -280.    | .0004   | -0.0000 | -0.0001 | -0.0005 | -0.0016 | -0.0010 | 243.  |        |  |
| .0750   | 655.  | -4.    | -131. | -244.    | -461.   | -80.     | .0003   | -0.0000 | -0.0001 | -0.0006 | -0.0015 | -0.0005 | 212.  |        |  |
| .0760   | 413.  | 88.    | -113. | -245.    | -382.   | 178.     | .0002   | -0.0000 | -0.0001 | -0.0005 | -0.0012 | .0002   | 196.  |        |  |
| .0770   | 161.  | 162.   | -24.  | -206.    | -319.   | 429.     | .0000   | -0.0000 | -0.0000 | -0.0003 | -0.0009 | .0009   | 230.  |        |  |
| .0780   | -25.  | 222.   | 74.   | -161.    | -281.   | 638.     | -0.0001 | .0000   | .0000   | -0.0001 | -0.0008 | .0015   | 287.  |        |  |
| .0790   | -200. | 240.   | 156.  | -142.    | -235.   | 815.     | -0.0001 | .0000   | .0000   | .0000   | -0.0006 | .0020   | 345.  |        |  |
| .0800   | -440. | 221.   | 204.  | -157.    | -139.   | 989.     | -0.0003 | .0000   | .0001   | .0000   | -0.0003 | .0025   | 406.  |        |  |
| .0810   | -705. | 228.   | 181.  | -183.    | 3.      | 1164.    | -0.0004 | .0000   | .0001   | -0.0000 | .0002   | .0031   | 473.  |        |  |
| .0820   | -890. | 275.   | 124.  | -185.    | 128.    | 1294.    | -0.0005 | .0000   | .0001   | -0.0001 | .0005   | .0034   | 527.  |        |  |
| .0830   | -953. | 285.   | 144.  | -142.    | 174.    | 1324.    | -0.0005 | .0000   | .0001   | .0001   | .0007   | .0035   | 539.  |        |  |
| .0840   | -934. | 243.   | 249.  | -62.     | 158.    | 1266.    | -0.0005 | .0000   | .0001   | .0002   | .0006   | .0034   | 513.  |        |  |
| .0850   | -890. | 238.   | 305.  | 23.      | 152.    | 1184.    | -0.0005 | .0001   | .0001   | .0004   | .0006   | .0032   | 479.  |        |  |
| .0860   | -824. | 297.   | 230.  | 79.      | 189.    | 1092.    | -0.0005 | .0001   | .0001   | .0005   | .0007   | .0029   | 446.  |        |  |
| .0870   | -691. | 314.   | 111.  | 86.      | 215.    | 932.     | -0.0004 | .0001   | .0001   | .0005   | .0007   | .0025   | 385.  |        |  |
| .0880   | -453. | 213.   | 46.   | 56.      | 174.    | 656.     | -0.0003 | .0000   | .0001   | .0003   | .0005   | .0017   | 273.  |        |  |
| .0890   | -135. | 71.    | 8.    | 21.      | 89.     | 312.     | -0.0001 | .0000   | .0000   | .0001   | .0002   | .0008   | 130.  |        |  |
| .0900   | 188.  | 7.     | -82.  | 12.      | 25.     | -18.     | .0001   | -0.0000 | -0.0000 | -0.0000 | -0.0001 | -0.0002 | 13.   |        |  |
| .0910   | 464.  | 23.    | -211. | 36.      | 0.      | -306.    | .0002   | -0.0000 | -0.0000 | -0.0001 | -0.0002 | -0.0010 | 123.  |        |  |
| .0920   | 717.  | 32.    | -309. | 77.      | -25.    | -586.    | .0003   | -0.0000 | -0.0001 | -0.0001 | -0.0004 | -0.0018 | 237.  |        |  |
| .0930   | 985.  | -12.   | -361. | 104.     | -76.    | -886.    | .0005   | -0.0000 | -0.0001 | -0.0001 | -0.0006 | -0.0026 | 359.  |        |  |
| .0940   | 1252. | -83.   | -421. | 96.      | -130.   | -1179.   | .0006   | -0.0000 | -0.0001 | -0.0002 | -0.0008 | -0.0034 | 478.  |        |  |
| .0950   | 1458. | -136.  | -530. | 54.      | -147.   | -1415.   | .0007   | -0.0001 | -0.0001 | -0.0004 | -0.0010 | -0.0041 | 571.  |        |  |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |       |       |       |      |       |        |        |        |        |        |        |        |      |
|-------|-------|-------|-------|------|-------|--------|--------|--------|--------|--------|--------|--------|------|
| .0850 | -890. | 238.  | 205.  | 23.  | 152.  | 1184.  | -.0005 | .0001  | .0001  | .0004  | .0006  | .0032  | 479. |
| .0860 | -824. | 297.  | 230.  | 79.  | 189.  | 1092.  | -.0005 | .0001  | .0001  | .0005  | .0007  | .0029  | 446. |
| .0870 | -691. | 314.  | 111.  | 86.  | 215.  | 932.   | -.0004 | .0001  | .0001  | .0005  | .0007  | .0025  | 385. |
| .0880 | -453. | 213.  | 46.   | 56.  | 174.  | 656.   | -.0003 | .0000  | .0001  | .0003  | .0005  | .0017  | 273. |
| .0890 | -135. | 71.   | 2.    | 21.  | 89.   | 312.   | -.0001 | .0000  | .0000  | .0001  | .0002  | .0008  | 130. |
| .0900 | 188.  | 7.    | -32.  | 12.  | 25.   | -18.   | .0001  | -.0000 | -.0000 | -.0000 | -.0001 | -.0002 | 13.  |
| .0910 | 464.  | 23.   | -211. | 36.  | 0.    | -306.  | .0002  | -.0000 | -.0000 | -.0001 | -.0002 | -.0010 | 123. |
| .0920 | 717.  | 32.   | -309. | 77.  | -25.  | -586.  | .0003  | -.0000 | -.0001 | -.0001 | -.0004 | -.0018 | 237. |
| .0930 | 985.  | -12.  | -361. | 104. | -76.  | -886.  | .0005  | -.0000 | -.0001 | -.0001 | -.0006 | -.0026 | 359. |
| .0940 | 1252. | -83.  | -421. | 96.  | -130. | -1179. | .0006  | -.0000 | -.0001 | -.0002 | -.0008 | -.0034 | 478. |
| .0950 | 1458. | -136. | -530. | 54.  | -147. | -1415. | .0007  | -.0001 | -.0001 | -.0004 | -.0010 | -.0041 | 571. |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
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CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | BEG | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|---------|--------|----------|----------|-----|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| 49      | 1      | 67       |          |     |      |    | .0960      | 1579.   | -155.   | -665.   | -2.        | -130.      | -1570.     | .0008   | -.0001  | -.0002  | -.0006   | -.0010   | -.0045   | 632.         |
|         |        |          |          |     |      |    | .0970      | 1655.   | -152.   | -771.   | -44.       | -118.      | -1666.     | .0008   | -.0001  | -.0002  | -.0008   | -.0010   | -.0048   | 671.         |
|         |        |          |          |     |      |    | .0980      | 1729.   | -142.   | -808.   | -56.       | -149.      | -1725.     | .0009   | -.0001  | -.0002  | -.0008   | -.0011   | -.0050   | 695.         |
|         |        |          |          |     |      |    | .0990      | 1777.   | -135.   | -771.   | -45.       | -215.      | -1738.     | .0009   | -.0001  | -.0002  | -.0008   | -.0012   | -.0050   | 703.         |
|         |        |          |          |     |      |    | .1000      | 1749.   | -121.   | -697.   | -30.       | -282.      | -1676.     | .0009   | -.0001  | -.0002  | -.0007   | -.0014   | -.0049   | 682.         |
|         |        |          |          |     |      |    | .1010      | 1648.   | -80.    | -643.   | -35.       | -332.      | -1531.     | .0008   | -.0001  | -.0002  | -.0006   | -.0015   | -.0045   | 629.         |
|         |        |          |          |     |      |    | .1020      | 1541.   | -19.    | -614.   | -67.       | -390.      | -1339.     | .0008   | -.0001  | -.0002  | -.0006   | -.0016   | -.0039   | 560.         |
|         |        |          |          |     |      |    | .1030      | 1471.   | 10.     | -540.   | -117.      | -495.      | -1144.     | .0007   | -.0001  | -.0001  | -.0006   | -.0018   | -.0034   | 503.         |
|         |        |          |          |     |      |    | .1040      | 1391.   | -25.    | -381.   | -162.      | -644.      | -947.      | .0007   | -.0000  | -.0001  | -.0006   | -.0021   | -.0029   | 464.         |
|         |        |          |          |     |      |    | .1050      | 1248.   | -24.    | -198.   | -180.      | -770.      | -692.      | .0006   | -.0000  | -.0001  | -.0005   | -.0024   | -.0022   | 422.         |
|         |        |          |          |     |      |    | .1060      | 1036.   | 103.    | -97.    | -166.      | -827.      | -347.      | .0005   | .0000   | -.0001  | -.0003   | -.0025   | -.0013   | 366.         |
|         |        |          |          |     |      |    | .1070      | 797.    | 285.    | -29.    | -136.      | -845.      | 32.        | .0004   | .0000   | -.0000  | -.0001   | -.0024   | -.0003   | 344.         |
|         |        |          |          |     |      |    | .1080      | 525.    | 325.    | 177.    | -115.      | -881.      | 362.       | .0003   | .0001   | .0000   | .0002    | -.0024   | .0007    | 385.         |
|         |        |          |          |     |      |    | .1090      | 170.    | 201.    | 509.    | -121.      | -899.      | 650.       | .0001   | .0001   | .0001   | .0003    | -.0023   | .0016    | 448.         |
|         |        |          |          |     |      |    | .1100      | -139.   | 358.    | 459.    | -146.      | -757.      | 1003.      | -.0001  | .0001   | .0001   | .0003    | -.0019   | .0025    | 508.         |
|         |        |          |          |     |      |    | .1110      | -471.   | 577.    | 300.    | -173.      | -525.      | 1355.      | -.0003  | .0001   | .0001   | .0003    | -.0012   | .0035    | 587.         |
|         |        |          |          |     |      |    | .1120      | -924.   | 479.    | 488.    | -180.      | -328.      | 1592.      | -.0005  | .0001   | .0001   | .0004    | -.0005   | .0042    | 656.         |
|         |        |          |          |     |      |    | .1130      | -1413.  | 314.    | 753.    | -157.      | -103.      | 1771.      | -.0007  | .0001   | .0002   | .0005    | .0003    | .0049    | 715.         |
|         |        |          |          |     |      |    | .1140      | -1813.  | 443.    | 678.    | -114.      | 248.       | 1977.      | -.0009  | .0001   | .0002   | .0006    | .0013    | .0056    | 801.         |
|         |        |          |          |     |      |    | .1150      | -2142.  | 625.    | 487.    | -85.       | 644.       | 2124.      | -.0011  | .0001   | .0002   | .0006    | .0023    | .0060    | 891.         |
|         |        |          |          |     |      |    | .1160      | -2480.  | 465.    | 571.    | -98.       | 963.       | 2090.      | -.0013  | .0001   | .0002   | .0006    | .0033    | .0061    | 924.         |
|         |        |          |          |     |      |    | .1170      | -2773.  | 148.    | 716.    | -155.      | 1255.      | 1924.      | -.0014  | .0000   | .0002   | .0003    | .0042    | .0058    | 924.         |
|         |        |          |          |     |      |    | .1180      | -2840.  | 149.    | 434.    | -226.      | 1618.      | 1738.      | -.0014  | -.0000  | .0001   | -.0000   | .0051    | .0053    | 957.         |
|         |        |          |          |     |      |    | .1190      | -2703.  | 240.    | 45.     | -285.      | 1930.      | 1460.      | -.0014  | -.0001  | .0001   | -.0004   | .0058    | .0045    | 978.         |
|         |        |          |          |     |      |    | .1200      | -2518.  | -13.    | 63.     | -321.      | 2057.      | 995.       | -.0013  | -.0001  | .0000   | -.0006   | .0060    | .0033    | 926.         |
|         |        |          |          |     |      |    | .1210      | -2299.  | -357.   | 196.    | -344.      | 2110.      | 462.       | -.0011  | -.0001  | -.0000  | -.0008   | .0062    | .0020    | 878.         |
|         |        |          |          |     |      |    | .1220      | -1942.  | -329.   | -93.    | -380.      | 2235.      | 14.        | -.0010  | -.0002  | -.0001  | -.0011   | .0063    | .0007    | 910.         |
|         |        |          |          |     |      |    | .1230      | -1427.  | -180.   | -572.   | -456.      | 2328.      | -446.      | -.0007  | -.0002  | -.0001  | -.0015   | .0063    | -.0007   | 969.         |
|         |        |          |          |     |      |    | .1240      | -839.   | -410.   | -698.   | -577.      | 2219.      | -1070.     | -.0004  | -.0003  | -.0002  | -.0020   | .0058    | -.0024   | 1015.        |
|         |        |          |          |     |      |    | .1250      | -218.   | -829.   | -632.   | -707.      | 1986.      | -1757.     | -.0001  | -.0003  | -.0003  | -.0025   | .0051    | -.0043   | 1101.        |
|         |        |          |          |     |      |    | .1260      | 422.    | -907.   | -870.   | -793.      | 1826.      | -2276.     | .0002   | -.0004  | -.0004  | -.0029   | .0044    | -.0059   | 1214.        |
|         |        |          |          |     |      |    | .1270      | 980.    | -717.   | -1254.  | -809.      | 1719.      | -2598.     | .0005   | -.0004  | -.0004  | -.0031   | .0039    | -.0069   | 1291.        |
|         |        |          |          |     |      |    | .1280      | 1359.   | -720.   | -1281.  | -772.      | 1514.      | -2851.     | .0007   | -.0004  | -.0005  | -.0030   | .0032    | -.0077   | 1332.        |
|         |        |          |          |     |      |    | .1290      | 1624.   | -876.   | -1065.  | -729.      | 1219.      | -3037.     | .0008   | -.0004  | -.0004  | -.0029   | .0024    | -.0082   | 1345.        |
|         |        |          |          |     |      |    | .1300      | 1890.   | -812.   | -1087.  | -723.      | 964.       | -3054.     | .0009   | -.0003  | -.0004  | -.0028   | .0017    | -.0084   | 1317.        |
|         |        |          |          |     |      |    | .1310      | 2098.   | -624.   | -1277.  | -769.      | 755.       | -2913.     | .0010   | -.0003  | -.0005  | -.0029   | .0010    | -.0081   | 1246.        |
|         |        |          |          |     |      |    | .1320      | 2084.   | -664.   | -1202.  | -835.      | 506.       | -2688.     | .0010   | -.0004  | -.0005  | -.0030   | .0004    | -.0076   | 1148.        |
|         |        |          |          |     |      |    | .1330      | 1856.   | -794.   | -931.   | -856.      | 245.       | -2338.     | .0009   | -.0003  | -.0004  | -.0029   | -.0001   | -.0065   | 1004.        |

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CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |       |        |       |       |        |       |       |       |       |       |       |       |
|-------|--------|-------|--------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|
| .1230 | -1427. | -180. | -572.  | -456. | 2728. | -446.  | -0007 | -0002 | -0001 | -0015 | .0063 | -0007 | 969.  |
| .1240 | -839.  | -410. | -692.  | -577. | 2219. | -1070. | -0004 | -0003 | -0002 | -0020 | .0058 | -0024 | 1015. |
| .1250 | -218.  | -829. | -632.  | -707. | 1986. | -1757. | -0001 | -0003 | -0003 | -0025 | .0051 | -0043 | 1101. |
| .1260 | 422.   | -907. | -870.  | -793. | 1826. | -2276. | .0002 | -0004 | -0004 | -0029 | .0044 | -0059 | 1214. |
| .1270 | 980.   | -717. | -1254. | -809. | 1719. | -2598. | .0005 | -0004 | -0004 | -0031 | .0039 | -0069 | 1291. |
| .1280 | 1359.  | -720. | -1281. | -772. | 1514. | -2851. | .0007 | -0004 | -0005 | -0030 | .0032 | -0077 | 1332. |
| .1290 | 1624.  | -876. | -1065. | -729. | 1219. | -3037. | .0008 | -0004 | -0004 | -0029 | .0024 | -0082 | 1345. |
| .1300 | 1890.  | -812. | -1087. | -723. | 964.  | -3054. | .0009 | -0003 | -0004 | -0028 | .0017 | -0084 | 1317. |
| .1310 | 2098.  | -624. | -1277. | -769. | 755.  | -2913. | .0010 | -0003 | -0005 | -0029 | .0010 | -0081 | 1246. |
| .1320 | 2084.  | -664. | -1202. | -835. | 506.  | -2688. | .0010 | -0004 | -0005 | -0030 | .0004 | -0076 | 1148. |
| .1330 | 1856.  | -794. | -931.  | -856. | 245.  | -2338. | .0009 | -0003 | -0004 | -0029 | -0001 | -0065 | 1004. |

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CONDITION 24

LOADS

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ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49     | MEMBER | 1      | SEQUENCE | 67      | LOCATION | BEG   | TYPE  | RU    |       |       |       |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|-------|-------|-------|-------|-------|-------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX    | DY    | DZ    | RX    | RY    | RZ    | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)  | (IN)  | (IN)  | (DEG) | (DEG) | (DEG) | (PSI)  |  |  |
| .1340   | 1565.  | -609.  | -824.  | -780.    | 48.     | -1775.   | .0002 | -0003 | -0004 | -0026 | -0005 | -0050 | 778.   |  |  |
| .1350   | 1256.  | -207.  | -770.  | -611.    | -150.   | -1067.   | .0006 | -0002 | -0003 | -0019 | -0009 | -0032 | 497.   |  |  |
| .1360   | 875.   | 2.     | -415.  | -412.    | -456.   | -365.    | .0004 | -0001 | -0002 | -0011 | -0015 | -0013 | 287.   |  |  |
| .1370   | 454.   | 56.    | 70.    | -258.    | -814.   | 322.     | .0002 | -0000 | -0000 | -0004 | -0022 | .0006 | 366.   |  |  |
| .1380   | 91.    | 264.   | 255.   | -184.    | -1089.  | 1057.    | .0000 | .0000 | .0000 | .0001 | -0028 | .0026 | 614.   |  |  |
| .1390   | -232.  | 550.   | 244.   | -167.    | -1302.  | 1798.    | -0001 | .0001 | .0001 | .0003 | -0033 | .0045 | 893.   |  |  |
| .1400   | -586.  | 636.   | 442.   | -138.    | -1563.  | 2442.    | -0003 | .0001 | .0001 | .0006 | -0038 | .0063 | 1165.  |  |  |
| .1410   | -898.  | 657.   | 794.   | -31.     | -1875.  | 2992.    | -0005 | .0002 | .0002 | .0011 | -0044 | .0078 | 1417.  |  |  |
| .1420   | -1030. | 932.   | 673.   | 164.     | -2169.  | 3502.    | -0005 | .0003 | .0003 | .0018 | -0051 | .0091 | 1654.  |  |  |
| .1430   | -995.  | 1311.  | 1040.  | 384.     | -2453.  | 3908.    | -0005 | .0004 | .0004 | .0025 | -0059 | .0100 | 1858.  |  |  |
| .1440   | -922.  | 1424.  | 1251.  | 539.     | -2755.  | 4110.    | -0005 | .0005 | .0005 | .0031 | -0067 | .0105 | 1997.  |  |  |
| .1450   | -836.  | 1326.  | 1442.  | 576.     | -2992.  | 4138.    | -0004 | .0005 | .0005 | .0032 | -0072 | .0106 | 2062.  |  |  |
| .1460   | -667.  | 1324.  | 1299.  | 514.     | -3069.  | 4076.    | -0004 | .0004 | .0005 | .0030 | -0075 | .0104 | 2058.  |  |  |
| .1470   | -402.  | 1386.  | 986.   | 426.     | -3055.  | 3903.    | -0003 | .0004 | .0004 | .0027 | -0076 | .0098 | 1996.  |  |  |
| .1480   | -71.   | 1278.  | 881.   | 385.     | -3080.  | 3536.    | -0001 | .0004 | .0004 | .0024 | -0078 | .0088 | 1888.  |  |  |
| .1490   | 333.   | 1086.  | 929.   | 413.     | -3129.  | 3013.    | .0001 | .0004 | .0003 | .0024 | -0080 | .0073 | 1751.  |  |  |
| .1500   | 801.   | 1046.  | 812.   | 468.     | -3078.  | 2447.    | .0004 | .0004 | .0003 | .0023 | -0081 | .0057 | 1589.  |  |  |
| .1510   | 1235.  | 1058.  | 526.   | 472.     | -2891.  | 1859.    | .0006 | .0003 | .0003 | .0021 | -0078 | .0041 | 1392.  |  |  |
| .1520   | 1568.  | 866.   | 284.   | 366.     | -2631.  | 1193.    | .0007 | .0003 | .0002 | .0016 | -0073 | .0023 | 1168.  |  |  |
| .1530   | 1877.  | 515.   | 55.    | 156.     | -2333.  | 452.     | .0009 | .0001 | .0000 | .0008 | -0066 | .0004 | 956.   |  |  |
| .1540   | 2252.  | 237.   | -302.  | -92.     | -2000.  | -296.    | .0011 | .0000 | -0001 | -0002 | -0059 | -0016 | 812.   |  |  |
| .1550   | 2634.  | 36.    | -665.  | -305.    | -1660.  | -1010.   | .0013 | -0001 | -0002 | -0010 | -0053 | -0036 | 789.   |  |  |
| .1560   | 2899.  | -210.  | -834.  | -440.    | -1343.  | -1669.   | .0014 | -0002 | -0003 | -0016 | -0045 | -0053 | 878.   |  |  |
| .1570   | 3021.  | -423.  | -900.  | -509.    | -1015.  | -2212.   | .0015 | -0002 | -0004 | -0019 | -0037 | -0067 | 998.   |  |  |
| .1580   | 3057.  | -476.  | -1075. | -558.    | -633.   | -2596.   | .0015 | -0002 | -0004 | -0022 | -0028 | -0077 | 1095.  |  |  |
| .1590   | 3032.  | -509.  | -1274. | -639.    | -254.   | -2872.   | .0015 | -0003 | -0005 | -0025 | -0019 | -0084 | 1185.  |  |  |
| .1600   | 2923.  | -674.  | -1335. | -768.    | 59.     | -3081.   | .0014 | -0003 | -0005 | -0030 | -0010 | -0089 | 1274.  |  |  |
| .1610   | 2731.  | -886.  | -1306. | -917.    | 320.    | -3183.   | .0013 | -0004 | -0005 | -0034 | -0003 | -0090 | 1335.  |  |  |
| .1620   | 2446.  | -951.  | -1327. | -1030.   | 588.    | -3099.   | .0012 | -0004 | -0006 | -0037 | .0005 | -0087 | 1331.  |  |  |
| .1630   | 2026.  | -871.  | -1334. | -1065.   | 860.    | -2817.   | .0010 | -0004 | -0005 | -0037 | .0013 | -0079 | 1257.  |  |  |
| .1640   | 1470.  | -777.  | -1184. | -1014.   | 1083.   | -2400.   | .0007 | -0004 | -0005 | -0034 | .0021 | -0067 | 1132.  |  |  |
| .1650   | 862.   | -683.  | -925.  | -905.    | 1243.   | -1897.   | .0004 | -0004 | -0004 | -0030 | .0027 | -0052 | 980.   |  |  |
| .1660   | 273.   | -524.  | -702.  | -755.    | 1363.   | -1328.   | .0001 | -0003 | -0003 | -0024 | .0032 | -0035 | 826.   |  |  |
| .1670   | -302.  | -350.  | -523.  | -687.    | 1456.   | -722.    | -0002 | -0002 | -0002 | -0020 | .0037 | -0018 | 708.   |  |  |
| .1680   | -898.  | -246.  | -305.  | -617.    | 1514.   | -113.    | -0005 | -0002 | -0001 | -0016 | .0040 | -0001 | 658.   |  |  |
| .1690   | -1498. | -169.  | -71.   | -548.    | 1549.   | 487.     | -0008 | -0001 | -0001 | -0013 | .0044 | .0017 | 688.   |  |  |
| .1700   | -2038. | -21.   | 106.   | -450.    | 1569.   | 1072.    | -0011 | -0001 | .0000 | -0008 | .0046 | .0033 | 783.   |  |  |
| .1710   | -2458. | 180.   | 254.   | -310.    | 1542.   | 1586.    | -0013 | -0000 | .0001 | -0003 | .0047 | .0048 | 896.   |  |  |

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CONDITION 24

LOADS

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PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |       |        |        |       |        |        |        |        |        |        |        |       |
|-------|--------|-------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|-------|
| .1610 | 2731.  | -886. | -1306. | -917.  | 320.  | -3183. | .0013  | -.0004 | -.0005 | -.0034 | -.0003 | -.0090 | 1274. |
| .1620 | 2446.  | -951. | -1327. | -1070. | 588.  | -2099. | .0012  | -.0004 | -.0006 | -.0037 | .0005  | -.0087 | 1331. |
| .1630 | 2026.  | -871. | -1334. | -1065. | 860.  | -2817. | .0010  | -.0004 | -.0005 | -.0037 | .0013  | -.0079 | 1257. |
| .1640 | 1470.  | -777. | -1184. | -1014. | 1083. | -2400. | .0007  | -.0004 | -.0005 | -.0034 | .0021  | -.0067 | 1132. |
| .1650 | 862.   | -683. | -925.  | -905.  | 1247. | -1897. | .0004  | -.0004 | -.0004 | -.0030 | .0027  | -.0052 | 980.  |
| .1660 | 273.   | -524. | -702.  | -785.  | 1363. | -1328. | .0001  | -.0003 | -.0003 | -.0024 | .0032  | -.0035 | 826.  |
| .1670 | -302.  | -350. | -523.  | -687.  | 1456. | -722.  | -.0002 | -.0002 | -.0002 | -.0020 | .0037  | -.0018 | 708.  |
| .1680 | -898.  | -246. | -305.  | -617.  | 1514. | -113.  | -.0005 | -.0002 | -.0001 | -.0016 | .0040  | -.0001 | 658.  |
| .1690 | -1498. | -169. | -71.   | -548.  | 1549. | 487.   | -.0008 | -.0001 | -.0001 | -.0013 | .0044  | .0017  | 688.  |
| .1700 | -2038. | -21.  | 106.   | -450.  | 1569. | 1072.  | -.0011 | -.0001 | .0000  | -.0008 | .0046  | .0033  | 783.  |
| .1710 | -2458. | 180.  | 254.   | -310.  | 1542. | 1506.  | -.0013 | -.0000 | .0001  | -.0007 | .0047  | .0048  | 896.  |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
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CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | BEG | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|---------|--------|----------|----------|-----|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| 49      | 1      | 67       |          |     |      |    | .1720      | -2719.  | 328.    | 445.    | -144.      | 1474.      | 1955.      | -.0014  | .0000   | .0002   | .0003    | .0045    | .0058    | 975.         |
|         |        |          |          |     |      |    | .1730      | -2814.  | 402.    | 643.    | 11.        | 1259.      | 2158.      | -.0014  | .0001   | .0002   | .0008    | .0042    | .0064    | 1003.        |
|         |        |          |          |     |      |    | .1740      | -2757.  | 459.    | 738.    | 125.       | 1073.      | 2219.      | -.0014  | .0001   | .0003   | .0011    | .0037    | .0065    | 990.         |
|         |        |          |          |     |      |    | .1750      | -2572.  | 508.    | 706.    | 184.       | 898.       | 2149.      | -.0013  | .0002   | .0003   | .0012    | .0032    | .0063    | 938.         |
|         |        |          |          |     |      |    | .1760      | -2268.  | 492.    | 636.    | 197.       | 708.       | 1932.      | -.0011  | .0002   | .0003   | .0012    | .0026    | .0056    | 829.         |
|         |        |          |          |     |      |    | .1770      | -1833.  | 404.    | 573.    | 188.       | 481.       | 1560.      | -.0009  | .0001   | .0002   | .0011    | .0019    | .0046    | 659.         |
|         |        |          |          |     |      |    | .1780      | -1266.  | 307.    | 476.    | 175.       | 233.       | 1064.      | -.0006  | .0001   | .0002   | .0009    | .0011    | .0032    | 443.         |
|         |        |          |          |     |      |    | .1790      | -601.   | 229.    | 320.    | 164.       | -11.       | 479.       | -.0003  | .0001   | .0001   | .0007    | .0003    | .0015    | 203.         |
|         |        |          |          |     |      |    | .1800      | 94.     | 121.    | 153.    | 148.       | -239.      | -170.      | .0001   | .0001   | .0001   | .0005    | -.0005   | -.0004   | 132.         |
|         |        |          |          |     |      |    | .1810      | 764.    | -33.    | -2.     | 118.       | -440.      | -848.      | .0004   | .0000   | -.0000  | .0002    | -.0013   | -.0023   | 386.         |
|         |        |          |          |     |      |    | .1820      | 1389.   | -188.   | -185.   | 72.        | -597.      | -1510.     | .0008   | -.0000  | -.0001  | -.0001   | -.0019   | -.0041   | 652.         |
|         |        |          |          |     |      |    | .1830      | 1953.   | -316.   | -396.   | 17.        | -709.      | -2115.     | .0011   | -.0001  | -.0002  | -.0005   | -.0023   | -.0058   | 895.         |
|         |        |          |          |     |      |    | .1840      | 2419.   | -450.   | -563.   | -41.       | -797.      | -2645.     | .0013   | -.0001  | -.0002  | -.0008   | -.0027   | -.0073   | 1109.        |
|         |        |          |          |     |      |    | .1850      | 2764.   | -594.   | -667.   | -91.       | -864.      | -3076.     | .0015   | -.0001  | -.0003  | -.0011   | -.0030   | -.0085   | 1283.        |
|         |        |          |          |     |      |    | .1860      | 2983.   | -691.   | -758.   | -126.      | -893.      | -3372.     | .0016   | -.0002  | -.0003  | -.0013   | -.0031   | -.0093   | 1401.        |
|         |        |          |          |     |      |    | .1870      | 3064.   | -730.   | -842.   | -136.      | -880.      | -3517.     | .0017   | -.0002  | -.0003  | -.0014   | -.0031   | -.0097   | 1456.        |
|         |        |          |          |     |      |    | .1880      | 2988.   | -752.   | -852.   | -116.      | -845.      | -3509.     | .0016   | -.0002  | -.0003  | -.0014   | -.0030   | -.0096   | 1449.        |
|         |        |          |          |     |      |    | .1890      | 2770.   | -754.   | -778.   | -63.       | -806.      | -3353.     | .0015   | -.0002  | -.0003  | -.0012   | -.0028   | -.0091   | 1384.        |
|         |        |          |          |     |      |    | .1900      | 2461.   | -683.   | -681.   | 18.        | -766.      | -3050.     | .0014   | -.0001  | -.0003  | -.0010   | -.0026   | -.0082   | 1262.        |
|         |        |          |          |     |      |    | .1910      | 2089.   | -546.   | -573.   | 114.       | -732.      | -2620.     | .0012   | -.0001  | -.0002  | -.0006   | -.0023   | -.0070   | 1093.        |
|         |        |          |          |     |      |    | .1920      | 1650.   | -415.   | -407.   | 209.       | -716.      | -2100.     | .0010   | -.0001  | -.0001  | -.0002   | -.0022   | -.0056   | 894.         |
|         |        |          |          |     |      |    | .1930      | 1153.   | -300.   | -199.   | 298.       | -710.      | -1512.     | .0007   | -.0000  | -.0001  | .0002    | -.0020   | -.0039   | 681.         |
|         |        |          |          |     |      |    | .1940      | 634.    | -147.   | -15.    | 386.       | -695.      | -868.      | .0004   | .0000   | .0000   | .0006    | -.0017   | -.0022   | 472.         |
|         |        |          |          |     |      |    | .1950      | 130.    | 55.     | 144.    | 488.       | -680.      | -199.      | .0002   | .0001   | .0001   | .0011    | -.0016   | -.0003   | 345.         |
|         |        |          |          |     |      |    | .1960      | -335.   | 255.    | 334.    | 606.       | -688.      | 445.       | -.0001  | .0002   | .0002   | .0016    | -.0014   | .0014    | 409.         |
|         |        |          |          |     |      |    | .1970      | -736.   | 436.    | 551.    | 733.       | -719.      | 1032.      | -.0003  | .0002   | .0003   | .0022    | -.0014   | .0030    | 584.         |
|         |        |          |          |     |      |    | .1980      | -1064.  | 616.    | 730.    | 845.       | -744.      | 1546.      | -.0005  | .0003   | .0004   | .0026    | -.0014   | .0044    | 768.         |
|         |        |          |          |     |      |    | .1990      | -1330.  | 773.    | 845.    | 917.       | -735.      | 1972.      | -.0006  | .0004   | .0004   | .0030    | -.0013   | .0055    | 921.         |
|         |        |          |          |     |      |    | .2000      | -1544.  | 867.    | 909.    | 935.       | -686.      | 2285.      | -.0007  | .0004   | .0004   | .0031    | -.0011   | .0063    | 1028.        |
|         |        |          |          |     |      |    | .2010      | -1685.  | 901.    | 920.    | 906.       | -602.      | 2467.      | -.0008  | .0004   | .0005   | .0031    | -.0009   | .0068    | 1082.        |
|         |        |          |          |     |      |    | .2020      | -1724.  | 902.    | 875.    | 849.       | -490.      | 2511.      | -.0009  | .0004   | .0004   | .0030    | -.0006   | .0069    | 1082.        |
|         |        |          |          |     |      |    | .2030      | -1663.  | 875.    | 796.    | 781.       | -360.      | 2416.      | -.0008  | .0003   | .0004   | .0027    | -.0003   | .0066    | 1029.        |
|         |        |          |          |     |      |    | .2040      | -1521.  | 809.    | 707.    | 705.       | -214.      | 2193.      | -.0008  | .0003   | .0004   | .0025    | -.0000   | .0060    | 929.         |
|         |        |          |          |     |      |    | .2050      | -1318.  | 713.    | 583.    | 608.       | -41.       | 1863.      | -.0007  | .0003   | .0003   | .0021    | .0003    | .0050    | 787.         |
|         |        |          |          |     |      |    | .2060      | -1064.  | 594.    | 395.    | 469.       | 167.       | 1447.      | -.0006  | .0002   | .0002   | .0016    | .0007    | .0039    | 614.         |
|         |        |          |          |     |      |    | .2070      | -768.   | 435.    | 155.    | 281.       | 400.       | 955.       | -.0004  | .0001   | .0002   | .0010    | .0011    | .0025    | 431.         |
|         |        |          |          |     |      |    | .2080      | -439.   | 227.    | -102.   | 53.        | 634.       | 405.       | -.0003  | .0000   | .0000   | .0002    | .0016    | .0010    | 303.         |
|         |        |          |          |     |      |    | .2090      | -85.    | -1.     | -357.   | -187.      | 858.       | -170.      | -.0001  | -.0001  | -.0001  | -.0006   | .0020    | -.0006   | 359.         |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |      |       |       |       |       |        |        |        |        |        |        |       |
|-------|--------|------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|-------|
| .1990 | -1330. | 773. | 845.  | 917.  | -735. | 1972. | -.0006 | .0004  | .0004  | .0030  | -.0013 | .0055  | 921.  |
| .2000 | -1544. | 867. | 909.  | 935.  | -686. | 2285. | -.0007 | .0004  | .0004  | .0031  | -.0011 | .0063  | 1028. |
| .2010 | -1685. | 901. | 920.  | 906.  | -602. | 2467. | -.0008 | .0004  | .0005  | .0031  | -.0009 | .0068  | 1082. |
| .2020 | -1724. | 902. | 875.  | 849.  | -490. | 2511. | -.0009 | .0004  | .0004  | .0030  | -.0006 | .0069  | 1082. |
| .2030 | -1667. | 875. | 796.  | 781.  | -360. | 2416. | -.0008 | .0003  | .0004  | .0027  | -.0003 | .0066  | 1029. |
| .2040 | -1521. | 809. | 707.  | 705.  | -214. | 2193. | -.0008 | .0003  | .0004  | .0025  | -.0000 | .0060  | 929.  |
| .2050 | -1318. | 713. | 583.  | 608.  | -41.  | 1863. | -.0007 | .0003  | .0003  | .0021  | .0003  | .0050  | 787.  |
| .2060 | -1064. | 594. | 395.  | 469.  | 167.  | 1447. | -.0006 | .0002  | .0002  | .0016  | .0007  | .0039  | 614.  |
| .2070 | -768.  | 435. | 155.  | 281.  | 400.  | 955.  | -.0004 | .0001  | .0002  | .0010  | .0011  | .0025  | 431.  |
| .2080 | -439.  | 227. | -102. | 53.   | 634.  | 405.  | -.0003 | .0000  | .0000  | .0002  | .0016  | .0010  | 303.  |
| .2090 | -85.   | -1.  | -357. | -187. | 258.  | -170. | -.0001 | -.0001 | -.0001 | -.0006 | .0020  | -.0006 | 359.  |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49     | MEMBER | 1      | SEQUENCE | 67      | LOCATION | BEG    | TYPE   | RU     |        |        |        |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |  |
| .2100   | 271.   | -204.  | -607.  | -409.    | 1067.   | -727.    | .0000  | -.0002 | -.0002 | -.0014 | .0024  | -.0021 | 544.   |  |  |
| .2110   | 601.   | -364.  | -833.  | -594.    | 1256.   | -1230.   | .0002  | -.0002 | -.0003 | -.0020 | .0027  | -.0035 | 745.   |  |  |
| .2120   | 884.   | -492.  | -1012. | -740.    | 1415.   | -1655.   | .0003  | -.0003 | -.0004 | -.0026 | .0030  | -.0047 | 923.   |  |  |
| .2130   | 1108.  | -595.  | -1146. | -859.    | 1541.   | -1986.   | .0004  | -.0004 | -.0004 | -.0030 | .0032  | -.0056 | 1066.  |  |  |
| .2140   | 1264.  | -669.  | -1252. | -963.    | 1635.   | -2204.   | .0005  | -.0004 | -.0005 | -.0033 | .0034  | -.0062 | 1167.  |  |  |
| .2150   | 1340.  | -711.  | -1329. | -1052.   | 1697.   | -2294.   | .0005  | -.0004 | -.0005 | -.0036 | .0035  | -.0065 | 1221.  |  |  |
| .2160   | 1328.  | -721.  | -1355. | -1117.   | 1720.   | -2251.   | .0005  | -.0004 | -.0005 | -.0037 | .0035  | -.0064 | 1222.  |  |  |
| .2170   | 1232.  | -692.  | -1317. | -1138.   | 1697.   | -2077.   | .0005  | -.0004 | -.0005 | -.0037 | .0035  | -.0060 | 1169.  |  |  |
| .2180   | 1066.  | -607.  | -1220. | -1103.   | 1627.   | -1776.   | .0004  | -.0004 | -.0005 | -.0035 | .0034  | -.0052 | 1063.  |  |  |
| .2190   | 834.   | -467.  | -1071. | -1013.   | 1517.   | -1362.   | .0003  | -.0004 | -.0004 | -.0031 | .0032  | -.0041 | 914.   |  |  |
| .2200   | 543.   | -295.  | -875.  | -881.    | 1374.   | -859.    | .0001  | -.0003 | -.0003 | -.0026 | .0029  | -.0027 | 740.   |  |  |
| .2210   | 213.   | -109.  | -652.  | -728.    | 1204.   | -299.    | -.0001 | -.0002 | -.0002 | -.0020 | .0026  | -.0012 | 577.   |  |  |
| .2220   | -119.  | 82.    | -423.  | -572.    | 1008.   | 283.     | -.0002 | -.0001 | -.0001 | -.0014 | .0022  | .0004  | 479.   |  |  |
| .2230   | -424.  | 265.   | -197.  | -420.    | 787.    | 849.     | -.0004 | -.0001 | -.0000 | -.0008 | .0018  | .0019  | 494.   |  |  |
| .2240   | -697.  | 427.   | 29.    | -274.    | 551.    | 1375.    | -.0005 | .0000  | .0000  | -.0002 | .0013  | .0034  | 604.   |  |  |
| .2250   | -935.  | 575.   | 245.   | -131.    | 314.    | 1842.    | -.0006 | .0001  | .0001  | .0004  | .0008  | .0046  | 752.   |  |  |
| .2260   | -1118. | 716.   | 428.   | 9.       | 88.     | 2229.    | -.0007 | .0001  | .0002  | .0009  | .0003  | .0057  | 895.   |  |  |
| .2270   | -1213. | 833.   | 577.   | 139.     | -132.   | 2501.    | -.0007 | .0002  | .0003  | .0013  | -.0002 | .0064  | 1006.  |  |  |
| .2280   | -1207. | 897.   | 701.   | 245.     | -348.   | 2631.    | -.0007 | .0003  | .0003  | .0017  | -.0007 | .0068  | 1070.  |  |  |
| .2290   | -1109. | 904.   | 785.   | 314.     | -544.   | 2618.    | -.0007 | .0003  | .0003  | .0019  | -.0012 | .0067  | 1080.  |  |  |
| .2300   | -935.  | 872.   | 800.   | 341.     | -698.   | 2475.    | -.0006 | .0003  | .0003  | .0019  | -.0016 | .0063  | 1041.  |  |  |
| .2310   | -699.  | 804.   | 748.   | 326.     | -803.   | 2212.    | -.0004 | .0003  | .0003  | .0018  | -.0019 | .0056  | 953.   |  |  |
| .2320   | -401.  | 683.   | 662.   | 278.     | -873.   | 1829.    | -.0003 | .0002  | .0003  | .0015  | -.0022 | .0046  | 821.   |  |  |
| .2330   | -40.   | 521.   | 555.   | 209.     | -918.   | 1339.    | -.0001 | .0002  | .0002  | .0012  | -.0024 | .0033  | 657.   |  |  |
| .2340   | 369.   | 348.   | 411.   | 128.     | -930.   | 772.     | .0001  | .0001  | .0001  | .0008  | -.0025 | .0017  | 488.   |  |  |
| .2350   | 799.   | 173.   | 234.   | 38.      | -906.   | 161.     | .0004  | .0001  | .0001  | .0004  | -.0026 | .0001  | 369.   |  |  |
| .2360   | 1222.  | -18.   | 53.    | -60.     | -853.   | -470.    | .0006  | .0000  | -.0000 | -.0001 | -.0026 | -.0015 | 392.   |  |  |
| .2370   | 1627.  | -225.  | -118.  | -167.    | -784.   | -1098.   | .0008  | -.0000 | -.0001 | -.0006 | -.0025 | -.0033 | 546.   |  |  |
| .2380   | 2008.  | -422.  | -292.  | -279.    | -700.   | -1693.   | .0010  | -.0001 | -.0002 | -.0011 | -.0025 | -.0049 | 744.   |  |  |
| .2390   | 2346.  | -588.  | -470.  | -391.    | -604.   | -2222.   | .0012  | -.0002 | -.0003 | -.0015 | -.0023 | -.0064 | 937.   |  |  |
| .2400   | 2627.  | -727.  | -626.  | -492.    | -508.   | -2667.   | .0013  | -.0002 | -.0003 | -.0019 | -.0022 | -.0076 | 1107.  |  |  |
| .2410   | 2851.  | -845.  | -730.  | -575.    | -427.   | -3022.   | .0014  | -.0003 | -.0004 | -.0023 | -.0021 | -.0085 | 1246.  |  |  |
| .2420   | 3030.  | -938.  | -799.  | -632.    | -375.   | -3283.   | .0015  | -.0003 | -.0004 | -.0025 | -.0020 | -.0093 | 1350.  |  |  |
| .2430   | 3158.  | -987.  | -823.  | -662.    | -348.   | -3436.   | .0016  | -.0003 | -.0004 | -.0026 | -.0020 | -.0097 | 1411.  |  |  |
| .2440   | 3217.  | -982.  | -822.  | -668.    | -333.   | -3470.   | .0016  | -.0003 | -.0004 | -.0026 | -.0020 | -.0098 | 1424.  |  |  |
| .2450   | 3210.  | -931.  | -796.  | -654.    | -333.   | -3390.   | .0016  | -.0003 | -.0004 | -.0025 | -.0020 | -.0096 | 1392.  |  |  |
| .2460   | 3162.  | -858.  | -733.  | -630.    | -361.   | -3226.   | .0016  | -.0003 | -.0004 | -.0024 | -.0021 | -.0092 | 1327.  |  |  |
| .2470   | 3107.  | -789.  | -621.  | -602.    | -430.   | -3010.   | .0015  | -.0002 | -.0004 | -.0022 | -.0022 | -.0087 | 1244.  |  |  |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |       |       |       |       |       |        |       |        |        |        |        |        |       |
|-------|-------|-------|-------|-------|-------|--------|-------|--------|--------|--------|--------|--------|-------|
| .2370 | 1627. | -225. | -118. | -167. | -784. | -1098. | .0008 | -.0000 | -.0001 | -.0006 | -.0025 | -.0033 | 546.  |
| .2380 | 2008. | -422. | -200. | -279. | -700. | -1693. | .0010 | -.0001 | -.0002 | -.0011 | -.0025 | -.0049 | 744.  |
| .2390 | 2746. | -588. | -470. | -391. | -604. | -2228. | .0012 | -.0002 | -.0003 | -.0015 | -.0023 | -.0064 | 937.  |
| .2400 | 2627. | -727. | -626. | -492. | -508. | -2607. | .0013 | -.0002 | -.0003 | -.0019 | -.0022 | -.0076 | 1107. |
| .2410 | 2891. | -845. | -730. | -575. | -427. | -3022. | .0014 | -.0003 | -.0004 | -.0023 | -.0021 | -.0085 | 1246. |
| .2420 | 3030. | -938. | -799. | -632. | -375. | -3283. | .0015 | -.0003 | -.0004 | -.0025 | -.0020 | -.0093 | 1350. |
| .2430 | 3158. | -987. | -823. | -662. | -348. | -3436. | .0016 | -.0003 | -.0004 | -.0026 | -.0020 | -.0097 | 1411. |
| .2440 | 3217. | -982. | -822. | -668. | -333. | -3470. | .0016 | -.0003 | -.0004 | -.0026 | -.0020 | -.0098 | 1424. |
| .2450 | 3210. | -931. | -796. | -654. | -323. | -3390. | .0016 | -.0003 | -.0004 | -.0025 | -.0020 | -.0096 | 1392. |
| .2460 | 3162. | -858. | -733. | -630. | -361. | -3226. | .0016 | -.0003 | -.0004 | -.0024 | -.0021 | -.0092 | 1327. |
| .2470 | 3107. | -789. | -621. | -602. | -430. | -3010. | .0015 | -.0002 | -.0004 | -.0022 | -.0022 | -.0087 | 1244. |

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S/RV PIPING KEVAUNEE GKV08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | BEG | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|---------|--------|----------|----------|-----|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| 49      | 1      | 67       |          |     |      |    | .2480      | 3041.   | -715.   | -487.   | -572.      | -521.      | -2752.     | .0015   | -.0002  | -.0003  | -.0020   | -.0025   | -.0081   | 1147.        |
|         |        |          |          |     |      |    | .2490      | 2935.   | -599.   | -378.   | -540.      | -593.      | -2438.     | .0014   | -.0002  | -.0003  | -.0018   | -.0026   | -.0073   | 1030.        |
|         |        |          |          |     |      |    | .2500      | 2784.   | -451.   | -290.   | -503.      | -635.      | -2084.     | .0013   | -.0001  | -.0002  | -.0015   | -.0027   | -.0064   | 897.         |
|         |        |          |          |     |      |    | .2510      | 2620.   | -318.   | -183.   | -465.      | -667.      | -1736.     | .0012   | -.0001  | -.0002  | -.0013   | -.0028   | -.0055   | 769.         |
|         |        |          |          |     |      |    | .2520      | 2476.   | -227.   | -49.    | -432.      | -700.      | -1433.     | .0011   | -.0001  | -.0002  | -.0011   | -.0028   | -.0047   | 663.         |
|         |        |          |          |     |      |    | .2530      | 2352.   | -166.   | 75.     | -418.      | -711.      | -1181.     | .0011   | -.0000  | -.0001  | -.0009   | -.0028   | -.0040   | 578.         |
|         |        |          |          |     |      |    | .2540      | 2235.   | -125.   | 154.    | -432.      | -677.      | -981.      | .0010   | -.0000  | -.0001  | -.0008   | -.0027   | -.0035   | 509.         |
|         |        |          |          |     |      |    | .2550      | 2135.   | -109.   | 179.    | -479.      | -594.      | -847.      | .0009   | -.0000  | -.0001  | -.0009   | -.0025   | -.0032   | 457.         |
|         |        |          |          |     |      |    | .2560      | 2097.   | -143.   | 179.    | -553.      | -493.      | -815.      | .0009   | -.0000  | -.0001  | -.0011   | -.0023   | -.0031   | 442.         |
|         |        |          |          |     |      |    | .2570      | 2203.   | -270.   | 209.    | -648.      | -435.      | -946.      | .0009   | -.0001  | -.0001  | -.0013   | -.0022   | -.0035   | 492.         |
|         |        |          |          |     |      |    | .2580      | 2489.   | -438.   | 222.    | -757.      | -425.      | -1234.     | .0011   | -.0001  | -.0002  | -.0016   | -.0023   | -.0043   | 606.         |
|         |        |          |          |     |      |    | .2590      | 2929.   | -556.   | 125.    | -881.      | -419.      | -1631.     | .0013   | -.0001  | -.0002  | -.0020   | -.0024   | -.0055   | 763.         |
|         |        |          |          |     |      |    | .2600      | 3503.   | -644.   | -68.    | -1024.     | -419.      | -2127.     | .0015   | -.0002  | -.0003  | -.0025   | -.0027   | -.0070   | 962.         |
|         |        |          |          |     |      |    | .2610      | 4230.   | -785.   | -270.   | -1194.     | -470.      | -2755.     | .0019   | -.0003  | -.0004  | -.0031   | -.0031   | -.0089   | 1220.        |
|         |        |          |          |     |      |    | .2620      | 5131.   | -997.   | -456.   | -1387.     | -594.      | -3521.     | .0023   | -.0003  | -.0005  | -.0038   | -.0038   | -.0112   | 1537.        |
|         |        |          |          |     |      |    | .2630      | 6139.   | -1205.  | -685.   | -1593.     | -743.      | -4352.     | .0028   | -.0004  | -.0006  | -.0045   | -.0046   | -.0137   | 1884.        |
|         |        |          |          |     |      |    | .2640      | 7063.   | -1308.  | -1024.  | -1790.     | -804.      | -5108.     | .0032   | -.0005  | -.0008  | -.0052   | -.0052   | -.0160   | 2196.        |
|         |        |          |          |     |      |    | .2650      | 7793.   | -1312.  | -1432.  | -1959.     | -739.      | -5725.     | .0035   | -.0005  | -.0009  | -.0058   | -.0054   | -.0179   | 2446.        |
|         |        |          |          |     |      |    | .2660      | 8321.   | -1335.  | -1760.  | -2086.     | -603.      | -6230.     | .0038   | -.0006  | -.0010  | -.0063   | -.0053   | -.0194   | 2648.        |
|         |        |          |          |     |      |    | .2670      | 8623.   | -1431.  | -1936.  | -2167.     | -413.      | -6619.     | .0039   | -.0006  | -.0010  | -.0067   | -.0050   | -.0206   | 2800.        |
|         |        |          |          |     |      |    | .2680      | 8562.   | -1487.  | -2074.  | -2201.     | -71.       | -6772.     | .0038   | -.0007  | -.0011  | -.0069   | -.0041   | -.0209   | 2858.        |
|         |        |          |          |     |      |    | .2690      | 8025.   | -1421.  | -2254.  | -2191.     | 497.       | -6594.     | .0036   | -.0007  | -.0011  | -.0070   | -.0026   | -.0204   | 2795.        |
|         |        |          |          |     |      |    | .2700      | 7052.   | -1314.  | -2385.  | -2134.     | 1225.      | -6130.     | .0031   | -.0007  | -.0010  | -.0069   | -.0004   | -.0189   | 2651.        |
|         |        |          |          |     |      |    | .2710      | 5838.   | -1300.  | -2317.  | -2031.     | 1949.      | -5521.     | .0025   | -.0007  | -.0010  | -.0067   | .0019    | -.0169   | 2487.        |
|         |        |          |          |     |      |    | .2720      | 4534.   | -1333.  | -2098.  | -1880.     | 2603.      | -4820.     | .0018   | -.0007  | -.0009  | -.0062   | .0040    | -.0146   | 2324.        |
|         |        |          |          |     |      |    | .2730      | 3152.   | -1245.  | -1909.  | -1678.     | 3231.      | -3976.     | .0012   | -.0007  | -.0008  | -.0056   | .0061    | -.0119   | 2164.        |
|         |        |          |          |     |      |    | .2740      | 1733.   | -1021.  | -1776.  | -1434.     | 3810.      | -3011.     | .0005   | -.0006  | -.0007  | -.0049   | .0081    | -.0090   | 2032.        |
|         |        |          |          |     |      |    | .2750      | 465.    | -795.   | -1577.  | -1162.     | 4199.      | -2074.     | -.0001  | -.0005  | -.0005  | -.0041   | .0096    | -.0061   | 1936.        |
|         |        |          |          |     |      |    | .2760      | -410.   | -658.   | -1248.  | -881.      | 4258.      | -1323.     | -.0005  | -.0004  | -.0004  | -.0032   | .0101    | -.0039   | 1824.        |
|         |        |          |          |     |      |    | .2770      | -819.   | -542.   | -889.   | -611.      | 3992.      | -777.      | -.0007  | -.0003  | -.0003  | -.0023   | .0097    | -.0023   | 1650.        |
|         |        |          |          |     |      |    | .2780      | -878.   | -344.   | -630.   | -362.      | 3513.      | -358.      | -.0007  | -.0002  | -.0002  | -.0015   | .0085    | -.0012   | 1424.        |
|         |        |          |          |     |      |    | .2790      | -671.   | -74.    | -477.   | -142.      | 2880.      | -44.       | -.0006  | -.0001  | -.0001  | -.0007   | .0069    | -.0005   | 1157.        |
|         |        |          |          |     |      |    | .2800      | -158.   | 179.    | -343.   | 51.        | 2068.      | 99.        | -.0004  | -.0000  | .0000   | -.0001   | .0047    | -.0003   | 831.         |
|         |        |          |          |     |      |    | .2810      | 687.    | 342.    | -156.   | 221.       | 1067.      | 21.        | .0001   | .0001   | .0001   | .0005    | .0019    | -.0008   | 437.         |
|         |        |          |          |     |      |    | .2820      | 1709.   | 430.    | 71.     | 370.       | -16.       | -209.      | .0006   | .0002   | .0001   | .0011    | -.0011   | -.0017   | 171.         |
|         |        |          |          |     |      |    | .2830      | 2648.   | 529.    | 244.    | 496.       | -997.      | -445.      | .0011   | .0003   | .0001   | .0015    | -.0039   | -.0025   | 481.         |
|         |        |          |          |     |      |    | .2840      | 3756.   | 681.    | 304.    | 590.       | -1761.     | -603.      | .0015   | .0003   | .0002   | .0019    | -.0061   | -.0032   | 784.         |
|         |        |          |          |     |      |    | .2850      | 3838.   | 806.    | 318.    | 644.       | -2313.     | -717.      | .0017   | .0004   | .0002   | .0021    | -.0076   | -.0036   | 1005.        |

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S/RV PIPING KEVAUNEE GKV08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |       |        |        |        |        |        |        |        |        |        |        |       |
|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| .2750 | 465.  | -795. | -1577. | -1162. | 4199.  | -2074. | -.0001 | -.0005 | -.0005 | -.0041 | .0096  | -.0061 | 1936. |
| .2760 | -410. | -658. | -1248. | -881.  | 4258.  | -1323. | -.0005 | -.0004 | -.0004 | -.0032 | .0101  | -.0039 | 1824. |
| .2770 | -819. | -542. | -809.  | -611.  | 3992.  | -777.  | -.0007 | -.0003 | -.0003 | -.0023 | .0097  | -.0023 | 1650. |
| .2780 | -878. | -344. | -630.  | -361.  | 3512.  | -358.  | -.0007 | -.0002 | -.0002 | -.0015 | .0085  | -.0012 | 1424. |
| .2790 | -671. | -74.  | -477.  | -142.  | 2080.  | -44.   | -.0006 | -.0001 | -.0001 | -.0007 | .0069  | -.0005 | 1157. |
| .2800 | -158. | 179.  | -343.  | 51.    | 2060.  | 99.    | -.0004 | -.0000 | .0000  | -.0001 | .0047  | -.0003 | 831.  |
| .2810 | 687.  | 342.  | -156.  | 221.   | 1067.  | 21.    | .0001  | .0001  | .0001  | .0005  | .0019  | -.0008 | 437.  |
| .2820 | 1709. | 430.  | 71.    | 370.   | -16.   | -209.  | .0006  | .0002  | .0001  | .0011  | -.0011 | -.0017 | 171.  |
| .2830 | 2648. | 529.  | 244.   | 496.   | -997.  | -445.  | .0011  | .0003  | .0001  | .0015  | -.0039 | -.0025 | 481.  |
| .2840 | 3756. | 681.  | 304.   | 590.   | -1761. | -603.  | .0015  | .0003  | .0002  | .0019  | -.0061 | -.0032 | 784.  |
| .2850 | 3838. | 806.  | 310.   | 644.   | -2713. | -717.  | .0017  | .0004  | .0002  | .0021  | -.0076 | -.0036 | 1005. |

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ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.01.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49     | MEMBER | 1      | SEQUENCE | 67      | LOCATION | BEG    | TYPE   | RU     |        |        |        |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |  |
| .2860   | 4113.  | 785.   | 406.   | 654.     | -2689.  | -840.    | .0019  | .0004  | .0002  | .0021  | -.0086 | -.0040 | 1161.  |  |  |
| .2870   | 4105.  | 628.   | 566.   | 626.     | -2851.  | -932.    | .0019  | .0004  | .0002  | .0021  | -.0089 | -.0041 | 1229.  |  |  |
| .2880   | 3731.  | 485.   | 662.   | 577.     | -2710.  | -896.    | .0018  | .0003  | .0002  | .0020  | -.0083 | -.0038 | 1169.  |  |  |
| .2890   | 3034.  | 440.   | 629.   | 525.     | -2273.  | -712.    | .0014  | .0003  | .0002  | .0018  | -.0069 | -.0030 | 974.   |  |  |
| .2900   | 2178.  | 395.   | 587.   | 475.     | -1674.  | -489.    | .0010  | .0003  | .0002  | .0016  | -.0051 | -.0021 | 725.   |  |  |
| .2910   | 1323.  | 228.   | 663.   | 422.     | -1055.  | -340.    | .0006  | .0002  | .0002  | .0015  | -.0031 | -.0014 | 476.   |  |  |
| .2920   | 533.   | -1.    | 783.   | 354.     | -442.   | -267.    | .0003  | .0002  | .0002  | .0012  | -.0012 | -.0008 | 251.   |  |  |
| .2930   | -176.  | -145.  | 776.   | 262.     | 202.    | -212.    | -.0001 | .0001  | .0002  | .0009  | .0007  | -.0004 | 158.   |  |  |
| .2940   | -740.  | -186.  | 622.   | 144.     | 837.    | -193.    | -.0004 | .0001  | .0001  | .0006  | .0025  | -.0001 | 349.   |  |  |
| .2950   | -1038. | -247.  | 468.   | 11.      | 1339.   | -313.    | -.0005 | .0000  | .0001  | .0001  | .0038  | -.0004 | 552.   |  |  |
| .2960   | -996.  | -386.  | 400.   | -119.    | 1636.   | -625.    | -.0005 | -.0000 | .0000  | -.0003 | .0046  | -.0012 | 704.   |  |  |
| .2970   | -675.  | -512.  | 342.   | -228.    | 1783.   | -1063.   | -.0003 | -.0001 | -.0000 | -.0006 | .0048  | -.0024 | 838.   |  |  |
| .2980   | -215.  | -531.  | 204.   | -311.    | 1882.   | -1526.   | -.0001 | -.0001 | -.0001 | -.0009 | .0048  | -.0038 | 980.   |  |  |
| .2990   | 286.   | -474.  | 6.     | -379.    | 1977.   | -1979.   | .0001  | -.0001 | -.0001 | -.0012 | .0048  | -.0052 | 1133.  |  |  |
| .3000   | 807.   | -448.  | -162.  | -445.    | 2056.   | -2451.   | .0003  | -.0001 | -.0001 | -.0014 | .0048  | -.0066 | 1296.  |  |  |
| .3010   | 1704.  | -503.  | -267.  | -521.    | 2138.   | -2940.   | .0005  | -.0001 | -.0002 | -.0017 | .0047  | -.0081 | 1474.  |  |  |
| .3020   | 1650.  | -601.  | -347.  | -604.    | 2306.   | -3374.   | .0007  | -.0002 | -.0002 | -.0020 | .0050  | -.0093 | 1658.  |  |  |
| .3030   | 1705.  | -678.  | -451.  | -681.    | 2651.   | -3665.   | .0007  | -.0002 | -.0003 | -.0023 | .0058  | -.0101 | 1835.  |  |  |
| .3040   | 1434.  | -718.  | -578.  | -736.    | 3189.   | -3790.   | .0006  | -.0002 | -.0003 | -.0025 | .0072  | -.0103 | 2009.  |  |  |
| .3050   | 913.   | -769.  | -667.  | -765.    | 3862.   | -3801.   | .0003  | -.0003 | -.0003 | -.0027 | .0091  | -.0102 | 2196.  |  |  |
| .3060   | 220.   | -886.  | -668.  | -773.    | 4606.   | -3754.   | -.0000 | -.0003 | -.0003 | -.0028 | .0112  | -.0098 | 2404.  |  |  |
| .3070   | -619.  | -1054. | -618.  | -780.    | 5407.   | -3651.   | -.0005 | -.0004 | -.0003 | -.0029 | .0136  | -.0092 | 2637.  |  |  |
| .3080   | -1571. | -1200. | -616.  | -801.    | 6268.   | -3474.   | -.0009 | -.0004 | -.0003 | -.0031 | .0161  | -.0084 | 2894.  |  |  |
| .3090   | -2530. | -1295. | -702.  | -846.    | 7135.   | -3255.   | -.0014 | -.0005 | -.0003 | -.0033 | .0186  | -.0075 | 3165.  |  |  |
| .3100   | -3341. | -1397. | -799.  | -909.    | 7886.   | -3083.   | -.0018 | -.0005 | -.0003 | -.0036 | .0208  | -.0068 | 3417.  |  |  |
| .3110   | -3884. | -1553. | -834.  | -977.    | 8420.   | -3025.   | -.0021 | -.0006 | -.0003 | -.0039 | .0223  | -.0065 | 3612.  |  |  |
| .3120   | -4127. | -1699. | -850.  | -1037.   | 8722.   | -3065.   | -.0022 | -.0006 | -.0004 | -.0041 | .0232  | -.0065 | 3733.  |  |  |
| .3130   | -4086. | -1739. | -935.  | -1084.   | 8822.   | -3151.   | -.0022 | -.0006 | -.0004 | -.0043 | .0234  | -.0067 | 3784.  |  |  |
| .3140   | -3765. | -1681. | -1087. | -1121.   | 8712.   | -3277.   | -.0020 | -.0006 | -.0004 | -.0044 | .0230  | -.0072 | 3762.  |  |  |
| .3150   | -3157. | -1617. | -1214. | -1158.   | 8355.   | -3475.   | -.0018 | -.0006 | -.0005 | -.0045 | .0218  | -.0079 | 3661.  |  |  |
| .3160   | -2300. | -1589. | -1276. | -1200.   | 7759.   | -3738.   | -.0013 | -.0006 | -.0005 | -.0046 | .0200  | -.0089 | 3490.  |  |  |
| .3170   | -1311. | -1537. | -1326. | -1239.   | 7008.   | -3986.   | -.0009 | -.0006 | -.0005 | -.0047 | .0177  | -.0100 | 3273.  |  |  |
| .3180   | -337.  | -1400. | -1406. | -1261.   | 6197.   | -4129.   | -.0004 | -.0006 | -.0006 | -.0047 | .0152  | -.0107 | 3031.  |  |  |
| .3190   | 530.   | -1200. | -1470. | -1247.   | 5368.   | -4134.   | .0000  | -.0006 | -.0006 | -.0045 | .0128  | -.0111 | 2765.  |  |  |
| .3200   | 1259.  | -999.  | -1445. | -1188.   | 4525.   | -4017.   | .0004  | -.0005 | -.0005 | -.0042 | .0104  | -.0111 | 2474.  |  |  |
| .3210   | 1815.  | -814.  | -1318. | -1085.   | 3693.   | -3777.   | .0006  | -.0004 | -.0005 | -.0038 | .0081  | -.0107 | 2164.  |  |  |
| .3220   | 2131.  | -620.  | -1136. | -947.    | 2934.   | -3382.   | .0008  | -.0003 | -.0004 | -.0032 | .0060  | -.0099 | 1836.  |  |  |
| .3230   | 2167.  | -399.  | -939.  | -784.    | 2289.   | -2820.   | .0008  | -.0003 | -.0003 | -.0026 | .0044  | -.0084 | 1491.  |  |  |

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ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.01.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |        |        |        |       |        |        |        |        |        |       |        |       |
|-------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|-------|--------|-------|
| .3130 | -4086. | -1739. | -935.  | -1084. | 8822. | -3151. | -.0022 | -.0006 | -.0004 | -.0043 | .0234 | -.0067 | 3784. |
| .3140 | -3765. | -1681. | -1087. | -1121. | 8712. | -3277. | -.0020 | -.0006 | -.0004 | -.0044 | .0230 | -.0072 | 3762. |
| .3150 | -3157. | -1617. | -1214. | -1158. | 8355. | -3475. | -.0018 | -.0006 | -.0005 | -.0045 | .0218 | -.0079 | 3661. |
| .3160 | -2700. | -1589. | -1276. | -1200. | 7759. | -7738. | -.0013 | -.0006 | -.0005 | -.0046 | .0200 | -.0089 | 3490. |
| .3170 | -1711. | -1577. | -1326. | -1239. | 7008. | -7986. | -.0009 | -.0006 | -.0005 | -.0047 | .0177 | -.0100 | 3273. |
| .3180 | -237.  | -1400. | -1406. | -1261. | 6197. | -4129. | -.0004 | -.0006 | -.0006 | -.0047 | .0152 | -.0107 | 3031. |
| .3190 | 530.   | -1200. | -1470. | -1247. | 5368. | -4134. | .0000  | -.0006 | -.0006 | -.0045 | .0128 | -.0111 | 2765. |
| .3200 | 1259.  | -999.  | -1445. | -1188. | 4525. | -4017. | .0004  | -.0005 | -.0005 | -.0042 | .0104 | -.0111 | 2474. |
| .3210 | 1815.  | -814.  | -1318. | -1085. | 3693. | -3777. | .0006  | -.0004 | -.0005 | -.0038 | .0081 | -.0107 | 2164. |
| .3220 | 2131.  | -620.  | -1136. | -947.  | 2934. | -7382. | .0005  | -.0003 | -.0004 | -.0032 | .0060 | -.0099 | 1836. |
| .3230 | 2167.  | -399.  | -939.  | -784.  | 2289. | -2820. | .0008  | -.0003 | -.0003 | -.0026 | .0044 | -.0084 | 1491. |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.01.

S/RV PIPING KEWAUNEE GAWOSF 2 RUP DISK  
2 SAFETY COLD FKM24F-- PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | BEG | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|---------|--------|----------|----------|-----|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| 49      | 1      | 67       |          |     |      |    | .3240      | 1968.   | -168.   | -727.   | -609.      | 1747.      | -2131.     | .0007   | -.0002  | -.0003  | -.0019   | .0031    | -.0066   | 1132.        |
|         |        |          |          |     |      |    | .3250      | 1637.   | 38.     | -478.   | -424.      | 1257.      | -1391.     | .0006   | -.0001  | -.0002  | -.0012   | .0021    | -.0046   | 771.         |
|         |        |          |          |     |      |    | .3260      | 1262.   | 206.    | -186.   | -232.      | 781.       | -663.      | .0004   | .0000   | -.0000  | -.0005   | .0011    | -.0026   | 421.         |
|         |        |          |          |     |      |    | .3270      | 892.    | 350.    | 124.    | -34.       | 308.       | 21.        | .0003   | .0001   | .0001   | .0002    | .0001    | -.0007   | 125.         |
|         |        |          |          |     |      |    | .3280      | 579.    | 498.    | 408.    | 164.       | -166.      | 630.       | .0001   | .0002   | .0002   | .0010    | -.0009   | .0010    | 269.         |
|         |        |          |          |     |      |    | .3290      | 407.    | 651.    | 641.    | 352.       | -664.      | 1113.      | .0001   | .0003   | .0003   | .0016    | -.0021   | .0024    | 539.         |
|         |        |          |          |     |      |    | .3300      | 451.    | 775.    | 835.    | 517.       | -1219.     | 1413.      | .0001   | .0003   | .0003   | .0022    | -.0034   | .0032    | 777.         |
|         |        |          |          |     |      |    | .3310      | 725.    | 841.    | 1006.   | 646.       | -1835.     | 1505.      | .0003   | .0004   | .0004   | .0026    | -.0050   | .0034    | 987.         |
|         |        |          |          |     |      |    | .3320      | 1188.   | 857.    | 1134.   | 736.       | -2474.     | 1406.      | .0005   | .0004   | .0004   | .0029    | -.0067   | .0030    | 1180.        |
|         |        |          |          |     |      |    | .3330      | 1787.   | 854.    | 1189.   | 784.       | -3089.     | 1150.      | .0009   | .0005   | .0004   | .0031    | -.0084   | .0022    | 1360.        |
|         |        |          |          |     |      |    | .3340      | 2470.   | 839.    | 1166.   | 797.       | -3642.     | 767.       | .0012   | .0005   | .0004   | .0031    | -.0100   | .0010    | 1527.        |
|         |        |          |          |     |      |    | .3350      | 3182.   | 778.    | 1111.   | 779.       | -4110.     | 273.       | .0016   | .0005   | .0003   | .0029    | -.0114   | -.0004   | 1682.        |
|         |        |          |          |     |      |    | .3360      | 3840.   | 658.    | 1048.   | 736.       | -4456.     | -291.      | .0020   | .0004   | .0003   | .0027    | -.0125   | -.0020   | 1816.        |
|         |        |          |          |     |      |    | .3370      | 4354.   | 503.    | 960.    | 670.       | -4625.     | -863.      | .0022   | .0004   | .0002   | .0024    | -.0130   | -.0036   | 1907.        |
|         |        |          |          |     |      |    | .3380      | 4657.   | 339.    | 828.    | 585.       | -4580.     | -1391.     | .0024   | .0004   | .0002   | .0020    | -.0130   | -.0050   | 1935.        |
|         |        |          |          |     |      |    | .3390      | 4723.   | 156.    | 673.    | 480.       | -4321.     | -1852.     | .0024   | .0003   | .0001   | .0016    | -.0123   | -.0061   | 1896.        |
|         |        |          |          |     |      |    | .3400      | 4554.   | -62.    | 524.    | 360.       | -3869.     | -2239.     | .0024   | .0002   | .0000   | .0011    | -.0111   | -.0070   | 1800.        |
|         |        |          |          |     |      |    | .3410      | 4175.   | -309.   | 389.    | 230.       | -3256.     | -2546.     | .0022   | .0001   | -.0000  | .0005    | -.0094   | -.0076   | 1661.        |
|         |        |          |          |     |      |    | .3420      | 3628.   | -553.   | 252.    | 97.        | -2514.     | -2769.     | .0020   | .0000   | -.0001  | -.0000   | -.0073   | -.0079   | 1501.        |
|         |        |          |          |     |      |    | .3430      | 2967.   | -770.   | 102.    | -32.       | -1687.     | -2909.     | .0016   | -.0000  | -.0002  | -.0006   | -.0050   | -.0080   | 1350.        |
|         |        |          |          |     |      |    | .3440      | 2267.   | -953.   | -55.    | -152.      | -839.      | -2989.     | .0013   | -.0001  | -.0002  | -.0010   | -.0026   | -.0079   | 1247.        |
|         |        |          |          |     |      |    | .3450      | 1628.   | -1120.  | -193.   | -262.      | -49.       | -3051.     | .0010   | -.0002  | -.0003  | -.0015   | -.0003   | -.0079   | 1229.        |
|         |        |          |          |     |      |    | .3460      | 1133.   | -1266.  | -309.   | -362.      | 621.       | -3124.     | .0007   | -.0003  | -.0003  | -.0019   | .0015    | -.0079   | 1286.        |
|         |        |          |          |     |      |    | .3470      | 818.    | -1368.  | -429.   | -452.      | 1142.      | -3209.     | .0006   | -.0003  | -.0003  | -.0022   | .0029    | -.0080   | 1379.        |
|         |        |          |          |     |      |    | .3480      | 691.    | -1407.  | -567.   | -533.      | 1507.      | -3299.     | .0005   | -.0004  | -.0004  | -.0025   | .0038    | -.0082   | 1471.        |
|         |        |          |          |     |      |    | .3490      | 758.    | -1398.  | -707.   | -602.      | 1695.      | -3401.     | .0005   | -.0004  | -.0004  | -.0028   | .0042    | -.0085   | 1544.        |
|         |        |          |          |     |      |    | .3500      | 1017.   | -1367.  | -817.   | -656.      | 1692.      | -3523.     | .0006   | -.0004  | -.0004  | -.0029   | .0041    | -.0090   | 1590.        |
|         |        |          |          |     |      |    | .3510      | 1427.   | -1315.  | -887.   | -687.      | 1519.      | -3650.     | .0008   | -.0004  | -.0005  | -.0030   | .0034    | -.0095   | 1610.        |
|         |        |          |          |     |      |    | .3520      | 1902.   | -1227.  | -930.   | -691.      | 1226.      | -3739.     | .0010   | -.0004  | -.0005  | -.0030   | .0025    | -.0099   | 1603.        |
|         |        |          |          |     |      |    | .3530      | 2343.   | -1089.  | -962.   | -666.      | 875.       | -3742.     | .0012   | -.0004  | -.0005  | -.0028   | .0014    | -.0102   | 1565.        |
|         |        |          |          |     |      |    | .3540      | 2687.   | -931.   | -960.   | -615.      | 498.       | -3647.     | .0013   | -.0003  | -.0004  | -.0026   | .0003    | -.0101   | 1497.        |
|         |        |          |          |     |      |    | .3550      | 2908.   | -800.   | -883.   | -543.      | 100.       | -3466.     | .0015   | -.0003  | -.0004  | -.0023   | -.0008   | -.0097   | 1408.        |
|         |        |          |          |     |      |    | .3560      | 2980.   | -703.   | -730.   | -451.      | -297.      | -3196.     | .0015   | -.0002  | -.0004  | -.0019   | -.0018   | -.0091   | 1301.        |
|         |        |          |          |     |      |    | .3570      | 2866.   | -606.   | -542.   | -339.      | -653.      | -2816.     | .0015   | -.0002  | -.0003  | -.0015   | -.0026   | -.0080   | 1168.        |
|         |        |          |          |     |      |    | .3580      | 2555.   | -480.   | -353.   | -207.      | -945.      | -2316.     | .0013   | -.0001  | -.0002  | -.0010   | -.0032   | -.0066   | 1007.        |
|         |        |          |          |     |      |    | .3590      | 2090.   | -346.   | -146.   | -58.       | -1197.     | -1733.     | .0011   | -.0000  | -.0001  | -.0005   | -.0036   | -.0049   | 846.         |
|         |        |          |          |     |      |    | .3600      | 1554.   | -244.   | 117.    | 107.       | -1460.     | -1127.     | .0009   | .0000   | -.0000  | .0001    | -.0040   | -.0031   | 741.         |
|         |        |          |          |     |      |    | .3610      | 1026.   | -180.   | 420.    | 280.       | -1767.     | -543.      | .0007   | .0001   | .0001   | .0007    | -.0045   | -.0014   | 750.         |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEWAUNEE GAWOSF 2 RUP DISK  
2 SAFETY COLD FKM24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |        |       |       |        |        |       |       |        |        |        |        |        |       |
|-------|-------|--------|-------|-------|--------|--------|-------|-------|--------|--------|--------|--------|--------|-------|
| .3510 | 1427. | -1315. | -887. | -687. | 1519.  | -3650. | 887.  | .0008 | -.0004 | -.0005 | -.0030 | .0034  | -.0095 | 1610. |
| .3520 | 1902. | -1227. | -930. | -691. | 1226.  | -3739. | 875.  | .0010 | -.0004 | -.0005 | -.0030 | .0025  | -.0099 | 1603. |
| .3530 | 2343. | -1089. | -962. | -666. | 875.   | -3742. | 498.  | .0012 | -.0004 | -.0005 | -.0028 | .0014  | -.0102 | 1565. |
| .3540 | 2687. | -931.  | -960. | -615. | 498.   | -3647. | 100.  | .0013 | -.0003 | -.0004 | -.0026 | .0003  | -.0101 | 1497. |
| .3550 | 2908. | -800.  | -883. | -547. | 100.   | -3486. | 297.  | .0015 | -.0002 | -.0004 | -.0023 | -.0008 | -.0097 | 1408. |
| .3560 | 2980. | -703.  | -730. | -451. | -297.  | -3196. | 2816. | .0015 | -.0002 | -.0004 | -.0019 | -.0018 | -.0091 | 1301. |
| .3570 | 2866. | -606.  | -542. | -339. | -653.  | -2816. | 107.  | .0015 | -.0002 | -.0003 | -.0015 | -.0026 | -.0080 | 1168. |
| .3580 | 2555. | -480.  | -353. | -207. | -945.  | -2316. | 107.  | .0013 | -.0001 | -.0002 | -.0010 | -.0032 | -.0066 | 1007. |
| .3590 | 2090. | -346.  | -146. | -58.  | -1197. | -1733. | 107.  | .0011 | -.0000 | -.0001 | -.0005 | -.0036 | -.0049 | 846.  |
| .3600 | 1554. | -244.  | 117.  | 107.  | -1460. | -1127. | 280.  | .0009 | .0000  | -.0000 | .0001  | -.0040 | -.0031 | 741.  |
| .3610 | 1026. | -180.  | 420.  | 280.  | -1767. | -543.  | 280.  | .0007 | .0001  | .0001  | .0007  | -.0045 | -.0014 | 750.  |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION    | 49      | MEMBER  | 1       | SEQUENCE   | 67         | LOCATION   | BEG     | TYPE    | RU      |          |          |          |              |  |  |
|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|--|--|
| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |  |  |
| .3620      | 552.    | -116.   | 721.    | 455.       | -2122.     | 6.         | .0005   | .0002   | .0001   | .0014    | -.0051   | .0003    | 871.         |  |  |
| .3630      | 164.    | -15.    | 967.    | 624.       | -2520.     | 513.       | .0003   | .0002   | .0002   | .0020    | -.0058   | .0018    | 1062.        |  |  |
| .3640      | -87.    | 100.    | 1172.   | 783.       | -2986.     | 943.       | .0002   | .0003   | .0003   | .0025    | -.0068   | .0030    | 1295.        |  |  |
| .3650      | -148.   | 188.    | 1378.   | 931.       | -3555.     | 1250.      | .0003   | .0004   | .0004   | .0030    | -.0081   | .0039    | 1558.        |  |  |
| .3660      | 3.      | 242.    | 1595.   | 1070.      | -4234.     | 1418.      | .0004   | .0004   | .0004   | .0035    | -.0098   | .0044    | 1843.        |  |  |
| .3670      | 328.    | 305.    | 1778.   | 1202.      | -4976.     | 1479.      | .0006   | .0005   | .0005   | .0040    | -.0117   | .0045    | 2138.        |  |  |
| .3680      | 751.    | 417.    | 1882.   | 1326.      | -5718.     | 1479.      | .0008   | .0005   | .0005   | .0044    | -.0136   | .0045    | 2429.        |  |  |
| .3690      | 1214.   | 549.    | 1934.   | 1441.      | -6426.     | 1434.      | .0011   | .0006   | .0005   | .0047    | -.0155   | .0042    | 2705.        |  |  |
| .3700      | 1683.   | 638.    | 1994.   | 1543.      | -7089.     | 1334.      | .0014   | .0006   | .0006   | .0051    | -.0173   | .0039    | 2960.        |  |  |
| .3710      | 2118.   | 662.    | 2080.   | 1630.      | -7682.     | 1187.      | .0016   | .0007   | .0006   | .0053    | -.0189   | .0034    | 3187.        |  |  |
| .3720      | 2437.   | 669.    | 2145.   | 1704.      | -8137.     | 1049.      | .0018   | .0007   | .0006   | .0055    | -.0201   | .0030    | 3363.        |  |  |
| .3730      | 2548.   | 710.    | 2139.   | 1769.      | -8384.     | 982.       | .0019   | .0007   | .0006   | .0057    | -.0207   | .0029    | 3461.        |  |  |
| .3740      | 2430.   | 758.    | 2099.   | 1830.      | -8419.     | 985.       | .0019   | .0007   | .0006   | .0058    | -.0207   | .0030    | 3480.        |  |  |
| .3750      | 2133.   | 748.    | 2091.   | 1883.      | -8289.     | 1011.      | .0017   | .0007   | .0006   | .0059    | -.0202   | .0032    | 3435.        |  |  |
| .3760      | 1711.   | 659.    | 2127.   | 1922.      | -8027.     | 1027.      | .0016   | .0007   | .0006   | .0059    | -.0193   | .0035    | 3338.        |  |  |
| .3770      | 1170.   | 549.    | 2139.   | 1941.      | -7620.     | 1055.      | .0013   | .0007   | .0006   | .0059    | -.0181   | .0038    | 3184.        |  |  |
| .3780      | 492.    | 488.    | 2055.   | 1930.      | -7041.     | 1135.      | .0010   | .0007   | .0006   | .0058    | -.0163   | .0043    | 2966.        |  |  |
| .3790      | -285.   | 468.    | 1889.   | 1917.      | -6325.     | 1250.      | .0006   | .0006   | .0006   | .0056    | -.0142   | .0048    | 2699.        |  |  |
| .3800      | -1064.  | 413.    | 1732.   | 1881.      | -5559.     | 1334.      | .0002   | .0006   | .0006   | .0053    | -.0120   | .0054    | 2415.        |  |  |
| .3810      | -1745.  | 258.    | 1661.   | 1829.      | -4834.     | 1323.      | -.0001  | .0005   | .0006   | .0051    | -.0099   | .0056    | 2141.        |  |  |
| .3820      | -2316.  | 70.     | 1604.   | 1757.      | -4145.     | 1245.      | -.0004  | .0004   | .0005   | .0047    | -.0080   | .0056    | 1874.        |  |  |
| .3830      | -2827.  | -41.    | 1446.   | 1665.      | -3438.     | 1175.      | -.0006  | .0004   | .0005   | .0043    | -.0060   | .0056    | 1604.        |  |  |
| .3840      | -3267.  | -89.    | 1208.   | 1554.      | -2734.     | 1110.      | -.0009  | .0003   | .0004   | .0039    | -.0042   | .0056    | 1338.        |  |  |
| .3850      | -3565.  | -169.   | 997.    | 1426.      | -2115.     | 991.       | -.0010  | .0003   | .0004   | .0034    | -.0026   | .0053    | 1098.        |  |  |
| .3860      | -3672.  | -317.   | 860.    | 1284.      | -1630.     | 789.       | -.0011  | .0002   | .0003   | .0029    | -.0013   | .0048    | 891.         |  |  |
| .3870      | -3647.  | -448.   | 724.    | 1137.      | -1230.     | 575.       | -.0011  | .0001   | .0003   | .0025    | -.0004   | .0042    | 711.         |  |  |
| .3880      | -3608.  | -474.   | 509.    | 989.       | -835.      | 444.       | -.0012  | .0001   | .0002   | .0020    | .0005    | .0038    | 549.         |  |  |
| .3890      | -3600.  | -421.   | 252.    | 845.       | -439.      | 415.       | -.0012  | .0000   | .0002   | .0016    | .0014    | .0036    | 417.         |  |  |
| .3900      | -3591.  | -385.   | 55.     | 703.       | -94.       | 441.       | -.0013  | -.0000  | .0001   | .0012    | .0021    | .0035    | 335.         |  |  |
| .3910      | -3569.  | -407.   | -45.    | 562.       | 178.       | 507.       | -.0013  | -.0001  | .0001   | .0008    | .0027    | .0036    | 312.         |  |  |
| .3920      | -3610.  | -414.   | -118.   | 425.       | 437.       | 674.       | -.0014  | -.0001  | .0000   | .0005    | .0032    | .0039    | 365.         |  |  |
| .3930      | -3800.  | -323.   | -243.   | 302.       | 749.       | 1016.      | -.0015  | -.0001  | .0000   | .0002    | .0040    | .0047    | 521.         |  |  |
| .3940      | -4122.  | -152.   | -389.   | 202.       | 1093.      | 1513.      | -.0017  | -.0001  | .0000   | .0000    | .0048    | .0059    | 753.         |  |  |
| .3950      | -4481.  | 9.      | -458.   | 128.       | 1385.      | 2082.      | -.0020  | -.0001  | .0000   | -.0000   | .0055    | .0073    | 1005.        |  |  |
| .3960      | -4812.  | 121.    | -415.   | 78.        | 1578.      | 2672.      | -.0022  | -.0001  | .0000   | -.0000   | .0060    | .0088    | 1246.        |  |  |
| .3970      | -5136.  | 245.    | -341.   | 44.        | 1707.      | 3306.      | -.0024  | -.0001  | .0001   | .0001    | .0063    | .0104    | 1493.        |  |  |
| .3980      | -5472.  | 456.    | -331.   | 19.        | 1812.      | 4011.      | -.0026  | -.0001  | .0001   | .0002    | .0066    | .0122    | 1766.        |  |  |
| .3990      | -5753.  | 722.    | -368.   | 1.         | 1854.      | 4733.      | -.0028  | -.0001  | .0001   | .0003    | .0067    | .0139    | 2040.        |  |  |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |       |       |      |       |       |        |        |       |        |       |       |       |
|-------|--------|-------|-------|------|-------|-------|--------|--------|-------|--------|-------|-------|-------|
| .3890 | -3600. | -421. | 252.  | 845. | -439. | 415.  | -.0012 | .0000  | .0002 | .0016  | .0014 | .0036 | 549.  |
| .3900 | -3591. | -385. | 55.   | 703. | -94.  | 441.  | -.0013 | -.0000 | .0001 | .0012  | .0021 | .0035 | 335.  |
| .3910 | -3569. | -407. | -45.  | 562. | 178.  | 507.  | -.0013 | -.0001 | .0001 | .0008  | .0027 | .0036 | 312.  |
| .3920 | -3610. | -414. | -118. | 425. | 437.  | 674.  | -.0014 | -.0001 | .0000 | .0005  | .0032 | .0039 | 365.  |
| .3930 | -3800. | -323. | -243. | 302. | 749.  | 1016. | -.0015 | -.0001 | .0000 | .0002  | .0040 | .0047 | 521.  |
| .3940 | -4122. | -152. | -389. | 202. | 1093. | 1513. | -.0017 | -.0001 | .0000 | .0000  | .0048 | .0059 | 753.  |
| .3950 | -4461. | 9.    | -458. | 128. | 1385. | 2082. | -.0020 | -.0001 | .0000 | -.0000 | .0055 | .0073 | 1005. |
| .3960 | -4812. | 121.  | -415. | 78.  | 1578. | 2672. | -.0022 | -.0001 | .0000 | -.0000 | .0060 | .0088 | 1246. |
| .3970 | -5126. | 245.  | -341. | 44.  | 1707. | 3306. | -.0024 | -.0001 | .0001 | .0001  | .0063 | .0104 | 1493. |
| .3980 | -5472. | 456.  | -331. | 19.  | 1812. | 4011. | -.0026 | -.0001 | .0001 | .0002  | .0066 | .0122 | 1766. |
| .3990 | -5753. | 722.  | -368. | 1.   | 1854. | 4733. | -.0028 | -.0001 | .0001 | .0003  | .0067 | .0139 | 2040. |

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CONDITION 24

LOADS

SHOCK

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ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|---------|--------|----------|----------|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| 49      | 1      | 67       | BEG      |      |    | .4000      | -5870.  | 951.    | -356.   | -10.       | 1748.      | 5372.      | -.0030  | -.0000  | .0002   | .0005    | .0063    | .0155    | 2267.        |

MAXIMUM VALUE OF STRESS OCCURS AT

| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| .3130      | 4086.   | 1739.   | 935.    | 1084.      | -8822.     | 3151.      | -.0022  | -.0006  | -.0004  | -.0043   | .0234    | -.0067   | 3784.        |

| SECTION | MEMBER | SEQUENCE | LOCATION | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|---------|--------|----------|----------|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| 49      | 1      | 68       | END      |      |    | 0.0000     | 0.      | 0.      | 0.      | 0.         | 0.         | 0.         | 0.0000  | 0.0000  | 0.0000  | 0.0000   | 0.0000   | 0.0000   | 0.           |
|         |        |          |          |      |    | .0010      | 0.      | -0.     | 0.      | -0.        | -0.        | -0.        | -.0000  | -.0000  | .0000   | -.0000   | .0000    | -.0000   | 0.           |
|         |        |          |          |      |    | .0020      | 1.      | -0.     | 0.      | -0.        | -1.        | -1.        | -.0000  | -.0000  | .0000   | -.0000   | .0000    | .0000    | 1.           |
|         |        |          |          |      |    | .0030      | 3.      | -1.     | 0.      | -0.        | -3.        | -3.        | -.0000  | -.0000  | .0000   | .0000    | .0000    | -.0000   | 2.           |
|         |        |          |          |      |    | .0040      | 5.      | -1.     | 1.      | -1.        | -6.        | -6.        | -.0000  | -.0000  | -.0000  | -.0000   | .0000    | .0000    | 4.           |
|         |        |          |          |      |    | .0050      | 8.      | -1.     | 0.      | -1.        | -10.       | -10.       | -.0000  | 0.0000  | .0000   | .0000    | .0000    | .0000    | 6.           |
|         |        |          |          |      |    | .0060      | 12.     | -1.     | -0.     | -1.        | -15.       | -14.       | 0.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 8.           |
|         |        |          |          |      |    | .0070      | 15.     | 0.      | -1.     | -2.        | -19.       | -18.       | -.0000  | 0.0000  | .0000   | -.0000   | 0.0000   | .0000    | 11.          |
|         |        |          |          |      |    | .0080      | 15.     | 2.      | -3.     | -1.        | -19.       | -18.       | -.0000  | -.0000  | .0000   | -.0000   | -.0000   | .0000    | 11.          |
|         |        |          |          |      |    | .0090      | 11.     | 4.      | -5.     | 0.         | -13.       | -12.       | 0.0000  | .0000   | .0000   | -.0000   | .0000    | -.0000   | 7.           |
|         |        |          |          |      |    | .0100      | 5.      | 4.      | -3.     | 2.         | -7.        | -6.        | 0.0000  | .0000   | .0000   | -.0000   | .0000    | 0.0000   | 4.           |
|         |        |          |          |      |    | .0110      | 1.      | 1.      | 2.      | 3.         | -3.        | -2.        | .0000   | -.0000  | -.0000  | -.0000   | .0000    | -.0000   | 2.           |
|         |        |          |          |      |    | .0120      | -3.     | -2.     | 6.      | 1.         | 1.         | 2.         | .0000   | -.0000  | -.0000  | .0000    | -.0000   | -.0000   | 1.           |
|         |        |          |          |      |    | .0130      | -9.     | -3.     | 5.      | -3.        | 9.         | 11.        | .0000   | -.0000  | -.0000  | .0000    | -.0000   | 0.0000   | 6.           |
|         |        |          |          |      |    | .0140      | -16.    | -2.     | 2.      | -10.       | 17.        | 20.        | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | 11.          |
|         |        |          |          |      |    | .0150      | -17.    | -2.     | 1.      | -16.       | 19.        | 24.        | -.0000  | -.0000  | -.0000  | .0000    | -.0000   | -.0000   | 14.          |
|         |        |          |          |      |    | .0160      | -11.    | -6.     | 3.      | -21.       | 10.        | 17.        | .0000   | -.0000  | .0000   | -.0000   | -.0000   | -.0000   | 12.          |
|         |        |          |          |      |    | .0170      | 0.      | -9.     | 7.      | -25.       | -7.        | 3.         | .0000   | -.0000  | -.0000  | .0000    | .0000    | -.0000   | 10.          |
|         |        |          |          |      |    | .0180      | 13.     | -9.     | 7.      | -28.       | -23.       | -10.       | .0000   | .0000   | .0000   | .0000    | .0000    | -.0000   | 15.          |
|         |        |          |          |      |    | .0190      | 24.     | -5.     | 2.      | -31.       | -36.       | -21.       | .0000   | -.0000  | -.0000  | .0000    | .0000    | .0000    | 21.          |
|         |        |          |          |      |    | .0200      | 36.     | 2.      | -6.     | -37.       | -50.       | -31.       | -.0000  | -.0000  | .0000   | .0000    | .0000    | -.0000   | 28.          |
|         |        |          |          |      |    | .0210      | 51.     | 5.      | -11.    | -45.       | -68.       | -46.       | .0000   | -.0000  | -.0000  | -.0000   | .0000    | -.0000   | 38.          |
|         |        |          |          |      |    | .0220      | 64.     | 2.      | -9.     | -53.       | -87.       | -59.       | -.0000  | -.0000  | .0000   | .0000    | -.0000   | 0.0000   | 47.          |
|         |        |          |          |      |    | .0230      | 64.     | -1.     | -5.     | -62.       | -90.       | -56.       | -.0000  | .0000   | .0000   | .0000    | .0000    | -.0000   | 49.          |

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ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK

2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |      |     |      |      |      |      |        |        |        |        |        |        |     |
|-------|------|-----|------|------|------|------|--------|--------|--------|--------|--------|--------|-----|
| .0130 | -9.  | -3. | 5.   | -3.  | 9.   | 11.  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 0.0000 | 6.  |
| .0140 | -16. | -2. | 2.   | -10. | 17.  | 20.  | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 11. |
| .0150 | -17. | -2. | 1.   | -16. | 19.  | 24.  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | -.0000 | 14. |
| .0160 | -11. | -6. | 3.   | -21. | 10.  | 17.  | .0000  | -.0000 | .0000  | -.0000 | -.0000 | -.0000 | 12. |
| .0170 | 0.   | -9. | 7.   | -25. | -7.  | 3.   | .0000  | -.0000 | -.0000 | .0000  | .0000  | -.0000 | 10. |
| .0180 | 13.  | -9. | 7.   | -21. | -23. | -10. | .0000  | .0000  | .0000  | .0000  | .0000  | -.0000 | 15. |
| .0190 | 24.  | -5. | 2.   | -31. | -36. | -21. | .0000  | -.0000 | -.0000 | .0000  | .0000  | .0000  | 21. |
| .0200 | 36.  | 2.  | -6.  | -37. | -50. | -31. | -.0000 | -.0000 | .0000  | .0000  | .0000  | -.0000 | 28. |
| .0210 | 51.  | 5.  | -11. | -45. | -68. | -46. | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 38. |
| .0220 | 64.  | 2.  | -9.  | -53. | -87. | -59. | -.0000 | -.0000 | .0000  | .0000  | -.0000 | 0.0000 | 47. |
| .0230 | 64.  | -1. | -5.  | -62. | -90. | -56. | -.0000 | .0000  | .0000  | .0000  | .0000  | -.0000 | 49. |

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S/RV PIPING KEWAUNEE GKW02F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | END | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|---------|--------|----------|----------|-----|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| 49      | 1      | 68       |          |     |      |    | .0240      | 49.     | -5.     | -6.     | -73.       | -72.       | -37.       | .0000   | -.0000  | .0000   | .0000    | .0000    | 0.0000   | 44.          |
|         |        |          |          |     |      |    | .0250      | 31.     | -7.     | -12.    | -80.       | -47.       | -16.       | .0000   | .0000   | .0000   | .0000    | .0000    | -.0000   | 38.          |
|         |        |          |          |     |      |    | .0260      | 17.     | -0.     | -18.    | -73.       | -25.       | 2.         | .0000   | .0000   | .0000   | .0000    | .0000    | -.0000   | 31.          |
|         |        |          |          |     |      |    | .0270      | -1.     | 8.      | -6.     | -45.       | -5.        | 26.        | .0000   | .0000   | .0000   | .0000    | -.0000   | -.0000   | 21.          |
|         |        |          |          |     |      |    | .0280      | -29.    | 5.      | 18.     | -17.       | 22.        | 57.        | .0000   | 0.0000  | -.0000  | .0000    | -.0000   | -.0000   | 26.          |
|         |        |          |          |     |      |    | .0290      | -55.    | -2.     | 24.     | -11.       | 57.        | 84.        | 0.0000  | -.0000  | -.0000  | .0000    | -.0000   | 0.0000   | 41.          |
|         |        |          |          |     |      |    | .0300      | -90.    | -5.     | 18.     | -15.       | 104.       | 123.       | .0000   | -.0000  | 0.0000  | .0000    | -.0000   | .0000    | 65.          |
|         |        |          |          |     |      |    | .0310      | -152.   | -20.    | 32.     | -14.       | 176.       | 192.       | .0000   | -.0000  | -.0000  | .0000    | -.0000   | 0.0000   | 105.         |
|         |        |          |          |     |      |    | .0320      | -215.   | -25.    | 36.     | -7.        | 249.       | 262.       | .0000   | -.0000  | -.0000  | -.0000   | .0000    | 0.0000   | 145.         |
|         |        |          |          |     |      |    | .0330      | -231.   | -3.     | 15.     | 13.        | 276.       | 283.       | .0000   | .0000   | -.0000  | 0.0000   | -.0000   | .0000    | 159.         |
|         |        |          |          |     |      |    | .0340      | -205.   | 6.      | 21.     | 53.        | 246.       | 249.       | -.0000  | .0000   | -.0000  | -.0000   | -.0000   | .0000    | 142.         |
|         |        |          |          |     |      |    | .0350      | -192.   | -26.    | 76.     | 107.       | 217.       | 214.       | .0000   | .0000   | .0000   | -.0000   | 0.0000   | -.0000   | 130.         |
|         |        |          |          |     |      |    | .0360      | -230.   | -47.    | 115.    | 158.       | 255.       | 243.       | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | 155.         |
|         |        |          |          |     |      |    | .0370      | -295.   | -1.     | 83.     | 199.       | 342.       | 324.       | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | 205.         |
|         |        |          |          |     |      |    | .0380      | -317.   | 56.     | 35.     | 222.       | 380.       | 362.       | -.0000  | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | 229.         |
|         |        |          |          |     |      |    | .0390      | -262.   | 30.     | 47.     | 215.       | 308.       | 282.       | 0.0000  | .0000   | .0000   | -.0000   | -.0000   | 0.0000   | 189.         |
|         |        |          |          |     |      |    | .0400      | -175.   | -57.    | 98.     | 183.       | 193.       | 142.       | -.0000  | .0000   | -.0000  | -.0000   | -.0000   | .0000    | 121.         |
|         |        |          |          |     |      |    | .0410      | -138.   | -95.    | 107.    | 167.       | 150.       | 75.        | -.0000  | .0000   | .0000   | -.0000   | .0000    | .0000    | 95.          |
|         |        |          |          |     |      |    | .0420      | -174.   | -42.    | 55.     | 190.       | 211.       | 122.       | .0000   | .0000   | -.0000  | -.0000   | .0000    | .0000    | 124.         |
|         |        |          |          |     |      |    | .0430      | -221.   | 18.     | 18.     | 243.       | 279.       | 182.       | -.0000  | -.0000  | -.0000  | -.0000   | -.0000   | .0000    | 165.         |
|         |        |          |          |     |      |    | .0440      | -163.   | 40.     | 23.     | 295.       | 211.       | 108.       | .0000   | .0000   | -.0000  | -.0000   | -.0000   | -.0000   | 152.         |
|         |        |          |          |     |      |    | .0450      | 10.     | 17.     | 54.     | 310.       | -1.        | -108.      | -.0000  | -.0000  | -.0000  | -.0000   | .0000    | .0000    | 132.         |
|         |        |          |          |     |      |    | .0460      | 148.    | -54.    | 96.     | 265.       | -176.      | -294.      | 0.0000  | -.0000  | -.0000  | -.0000   | .0000    | 0.0000   | 174.         |
|         |        |          |          |     |      |    | .0470      | 131.    | -108.   | 83.     | 169.       | -151.      | -292.      | 0.0000  | -.0000  | -.0000  | -.0000   | .0000    | .0000    | 148.         |
|         |        |          |          |     |      |    | .0480      | 50.     | -52.    | -43.    | 71.        | -21.       | -180.      | 0.0000  | -.0000  | -.0000  | -.0000   | .0000    | .0000    | 78.          |
|         |        |          |          |     |      |    | .0490      | 101.    | 51.     | -173.   | 24.        | -46.       | -200.      | 0.0000  | .0000   | -.0000  | -.0000   | .0000    | .0000    | 83.          |
|         |        |          |          |     |      |    | .0500      | 309.    | 28.     | -123.   | 36.        | -312.      | -437.      | -.0000  | .0000   | .0000   | -.0000   | .0000    | .0000    | 216.         |
|         |        |          |          |     |      |    | .0510      | 492.    | -108.   | 59.     | 63.        | -591.      | -679.      | 0.0000  | .0000   | .0000   | -.0000   | .0000    | 0.0000   | 362.         |
|         |        |          |          |     |      |    | .0520      | 510.    | -127.   | 94.     | 49.        | -633.      | -684.      | -.0000  | -.0000  | -.0000  | -.0000   | .0000    | .0000    | 374.         |
|         |        |          |          |     |      |    | .0530      | 418.    | 38.     | -102.   | -27.       | -476.      | -493.      | -.0000  | -.0000  | .0000   | -.0000   | .0000    | .0000    | 275.         |
|         |        |          |          |     |      |    | .0540      | 364.    | 137.    | -249.   | -134.      | -380.      | -359.      | .0000   | .0000   | .0000   | -.0000   | .0000    | 0.0000   | 217.         |
|         |        |          |          |     |      |    | .0550      | 425.    | 17.     | -156.   | -224.      | -496.      | -429.      | .0000   | -.0000  | .0000   | .0000    | .0000    | 0.0000   | 278.         |
|         |        |          |          |     |      |    | .0560      | 554.    | -118.   | -14.    | -266.      | -705.      | -581.      | -.0000  | -.0000  | -.0000  | .0000    | .0000    | -.0000   | 382.         |
|         |        |          |          |     |      |    | .0570      | 609.    | -63.    | -34.    | -257.      | -775.      | -584.      | 0.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 403.         |
|         |        |          |          |     |      |    | .0580      | 489.    | 77.     | -113.   | -209.      | -618.      | -354.      | -.0000  | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | 298.         |
|         |        |          |          |     |      |    | .0590      | 276.    | 130.    | -94.    | -152.      | -385.      | -45.       | .0000   | -.0000  | .0000   | .0000    | -.0000   | -.0000   | 167.         |
|         |        |          |          |     |      |    | .0600      | 166.    | 122.    | -32.    | -125.      | -284.      | 127.       | .0000   | .0000   | .0000   | .0000    | .0000    | -.0000   | 135.         |
|         |        |          |          |     |      |    | .0610      | 186.    | 110.    | -4.     | -148.      | -323.      | 149.       | .0000   | -.0000  | .0000   | .0000    | .0000    | 0.0000   | 154.         |

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2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |      |       |       |       |       |       |        |        |        |        |        |        |      |
|-------|------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|------|
| .0510 | 452. | -108. | 59.   | 63.   | -591. | -679. | 0.0000 | .0000  | .0000  | -.0000 | .0000  | 0.0000 | 362. |
| .0520 | 510. | -127. | 94.   | 49.   | -633. | -684. | -.0000 | -.0000 | -.0000 | -.0000 | .0000  | .0000  | 374. |
| .0530 | 418. | 38.   | -102. | -27.  | -476. | -493. | -.0000 | -.0000 | .0000  | -.0000 | .0000  | .0000  | 275. |
| .0540 | 364. | 137.  | -249. | -134. | -380. | -359. | .0000  | .0000  | .0000  | -.0000 | .0000  | 0.0000 | 217. |
| .0550 | 425. | 17.   | -156. | -224. | -496. | -429. | .0000  | -.0000 | .0000  | .0000  | .0000  | 0.0000 | 278. |
| .0560 | 554. | -118. | -14.  | -266. | -705. | -581. | -.0000 | -.0000 | -.0000 | .0000  | .0000  | -.0000 | 382. |
| .0570 | 609. | -63.  | -34.  | -257. | -775. | -584. | 0.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 403. |
| .0580 | 489. | 77.   | -113. | -209. | -618. | -354. | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 298. |
| .0590 | 276. | 130.  | -94.  | -152. | -385. | -45.  | .0000  | -.0000 | .0000  | .0000  | -.0000 | -.0000 | 167. |
| .0600 | 166. | 122.  | -32.  | -125. | -284. | 127.  | .0000  | .0000  | .0000  | .0000  | .0000  | -.0000 | 135. |
| .0610 | 186. | 110.  | -4.   | -148. | -323. | 149.  | .0000  | -.0000 | .0000  | .0000  | .0000  | 0.0000 | 154. |

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CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | END | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |       |
|---------|--------|----------|----------|-----|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|-------|
| 49      | 1      | 68       |          |     |      |    | .0620      | 152.    | 61.     | 40.     | -197.      | -302.      | 216.       | .0000   | .0000   | .0000   | .0000    | .0000    | -.0000   | 169.         |       |
|         |        |          |          |     |      |    | .0630      | -41.    | 16.     | 82.     | -230.      | -90.       | 458.       | 0.0000  | -.0000  | .0000   | .0000    | .0000    | 0.0000   | 0.0000       | 209.  |
|         |        |          |          |     |      |    | .0640      | -276.   | 83.     | 31.     | -210.      | 208.       | 772.       | 0.0000  | .0000   | .0000   | .0000    | -.0000   | -.0000   | -.0000       | 332.  |
|         |        |          |          |     |      |    | .0650      | -419.   | 192.    | -21.    | -115.      | 409.       | 980.       | 0.0000  | .0000   | .0000   | .0000    | -.0000   | 0.0000   | 0.0000       | 429.  |
|         |        |          |          |     |      |    | .0660      | -502.   | 168.    | 102.    | 38.        | 490.       | 1061.      | .0000   | -.0000  | -.0000  | .0000    | -.0000   | -.0000   | -.0000       | 469.  |
|         |        |          |          |     |      |    | .0670      | -609.   | 74.     | 291.    | 183.       | 579.       | 1134.      | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | -.0000       | 516.  |
|         |        |          |          |     |      |    | .0680      | -742.   | 105.    | 280.    | 247.       | 759.       | 1269.      | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | 0.0000   | 0.0000       | 601.  |
|         |        |          |          |     |      |    | .0690      | -862.   | 204.    | 135.    | 213.       | 973.       | 1400.      | .0000   | .0000   | -.0000  | .0000    | -.0000   | -.0000   | -.0000       | 689.  |
|         |        |          |          |     |      |    | .0700      | -940.   | 150.    | 98.     | 133.       | 1106.      | 1416.      | -.0000  | .0000   | -.0000  | -.0000   | -.0000   | 0.0000   | 0.0000       | 723.  |
|         |        |          |          |     |      |    | .0710      | -949.   | -24.    | 194.    | 81.        | 1120.      | 1295.      | .0000   | -.0000  | -.0000  | .0000    | -.0000   | -.0000   | -.0000       | 688.  |
|         |        |          |          |     |      |    | .0720      | -897.   | -84.    | 220.    | 106.       | 1088.      | 1126.      | 0.0000  | -.0000  | -.0000  | .0000    | -.0000   | -.0000   | -.0000       | 630.  |
|         |        |          |          |     |      |    | .0730      | -842.   | 6.      | 141.    | 200.       | 1085.      | 990.       | .0000   | 0.0000  | -.0000  | -.0000   | -.0000   | -.0000   | -.0000       | 595.  |
|         |        |          |          |     |      |    | .0740      | -789.   | 62.     | 104.    | 305.       | 1066.      | 833.       | -.0000  | .0000   | -.0000  | -.0000   | 0.0000   | .0000    | .0000        | 557.  |
|         |        |          |          |     |      |    | .0750      | -655.   | 4.      | 131.    | 339.       | 931.       | 543.       | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | .0000    | .0000        | 453.  |
|         |        |          |          |     |      |    | .0760      | -413.   | -88.    | 113.    | 263.       | 681.       | 120.       | -.0000  | -.0000  | -.0000  | -.0000   | -.0000   | .0000    | .0000        | 297.  |
|         |        |          |          |     |      |    | .0770      | -161.   | -162.   | 24.     | 109.       | 434.       | -304.      | 0.0000  | -.0000  | 0.0000  | -.0000   | -.0000   | 0.0000   | 0.0000       | 217.  |
|         |        |          |          |     |      |    | .0780      | 25.     | -222.   | -74.    | -48.       | 258.       | -640.      | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | .0000        | 278.  |
|         |        |          |          |     |      |    | .0790      | 200.    | -240.   | -156.   | -137.      | 83.        | -939.      | -.0000  | -.0000  | .0000   | -.0000   | -.0000   | .0000    | .0000        | 382.  |
|         |        |          |          |     |      |    | .0800      | 440.    | -221.   | -204.   | -142.      | -185.      | -1284.     | -.0000  | -.0000  | .0000   | -.0000   | 0.0000   | 0.0000   | 0.0000       | 524.  |
|         |        |          |          |     |      |    | .0810      | 705.    | -228.   | -181.   | -105.      | -511.      | -1616.     | -.0000  | -.0000  | .0000   | -.0000   | .0000    | .0000    | .0000        | 693.  |
|         |        |          |          |     |      |    | .0820      | 890.    | -275.   | -124.   | -96.       | -763.      | -1904.     | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | .0000        | 824.  |
|         |        |          |          |     |      |    | .0830      | 953.    | -285.   | -144.   | -160.      | -855.      | -1978.     | -.0000  | -.0000  | .0000   | -.0000   | .0000    | .0000    | .0000        | 867.  |
|         |        |          |          |     |      |    | .0840      | 934.    | -243.   | -249.   | -285.      | -833.      | -1910.     | -.0000  | -.0000  | .0000   | -.0000   | .0000    | .0000    | .0000        | 844.  |
|         |        |          |          |     |      |    | .0850      | 890.    | -238.   | -305.   | -406.      | -800.      | -1796.     | 0.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | .0000        | 806.  |
|         |        |          |          |     |      |    | .0860      | 824.    | -297.   | -230.   | -451.      | -785.      | -1654.     | 0.0000  | 0.0000  | .0000   | -.0000   | .0000    | 0.0000   | 0.0000       | 757.  |
|         |        |          |          |     |      |    | .0870      | 691.    | -314.   | -111.   | -385.      | -709.      | -1398.     | 0.0000  | .0000   | .0000   | -.0000   | .0000    | .0000    | .0000        | 648.  |
|         |        |          |          |     |      |    | .0880      | 453.    | -213.   | -46.    | -238.      | -496.      | -962.      | 0.0000  | .0000   | .0000   | -.0000   | .0000    | .0000    | .0000        | 445.  |
|         |        |          |          |     |      |    | .0890      | 135.    | -71.    | -8.     | -77.       | -184.      | -402.      | 0.0000  | -.0000  | .0000   | .0000    | .0000    | .0000    | .0000        | 180.  |
|         |        |          |          |     |      |    | .0900      | -188.   | -7.     | 82.     | 41.        | 112.       | 152.       | -.0000  | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | -.0000       | 78.   |
|         |        |          |          |     |      |    | .0910      | -464.   | -23.    | 211.    | 97.        | 341.       | 635.       | .0000   | .0000   | -.0000  | .0000    | -.0000   | -.0000   | -.0000       | 292.  |
|         |        |          |          |     |      |    | .0920      | -717.   | -32.    | 309.    | 119.       | 551.       | 1095.      | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | 0.0000   | 0.0000       | 494.  |
|         |        |          |          |     |      |    | .0930      | -985.   | 12.     | 361.    | 159.       | 795.       | 1582.      | 0.0000  | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | -.0000       | 713.  |
|         |        |          |          |     |      |    | .0940      | -1252.  | 83.     | 421.    | 260.       | 1040.      | 2059.      | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | -.0000       | 932.  |
|         |        |          |          |     |      |    | .0950      | -1458.  | 136.    | 530.    | 417.       | 1211.      | 2436.      | 0.0000  | .0000   | -.0000  | .0000    | -.0000   | 0.0000   | 0.0000       | 1104. |
|         |        |          |          |     |      |    | .0960      | -1579.  | 155.    | 665.    | 582.       | 1287.      | 2676.      | .0000   | 0.0000  | -.0000  | -.0000   | -.0000   | -.0000   | -.0000       | 1214. |
|         |        |          |          |     |      |    | .0970      | -1655.  | 152.    | 771.    | 696.       | 1337.      | 2826.      | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | -.0000       | 1285. |
|         |        |          |          |     |      |    | .0980      | -1729.  | 142.    | 808.    | 728.       | 1422.      | 2937.      | .0000   | .0000   | -.0000  | -.0000   | -.0000   | 0.0000   | 0.0000       | 1342. |
|         |        |          |          |     |      |    | .0990      | -1777.  | 135.    | 771.    | 685.       | 1520.      | 2985.      | -.0000  | -.0000  | -.0000  | -.0000   | -.0000   | 0.0000   | 0.0000       | 1372. |

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S/RV PIPING KEWAUNEE GKW02F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |      |      |      |       |       |         |         |         |         |         |         |         |       |
|-------|--------|------|------|------|-------|-------|---------|---------|---------|---------|---------|---------|---------|-------|
| .0890 | 135.   | -71. | -8.  | -77. | -184. | -402. | 0.0000  | -0.0000 | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 180.  |
| .0900 | -188.  | -7.  | 82.  | 41.  | 112.  | 152.  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 78.   |
| .0910 | -424.  | -23. | 211. | 97.  | 341.  | 635.  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | -0.0000 | -0.0000 | -0.0000 | 292.  |
| .0920 | -717.  | -31. | 709. | 119. | 551.  | 1095. | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 494.  |
| .0930 | -915.  | 12.  | 361. | 159. | 795.  | 1592. | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 713.  |
| .0940 | -1252. | 83.  | 421. | 260. | 1040. | 2059. | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 932.  |
| .0950 | -1458. | 176. | 530. | 417. | 1211. | 2436. | 0.0000  | 0.0000  | -0.0000 | 0.0000  | -0.0000 | -0.0000 | 0.0000  | 1104. |
| .0960 | -1579. | 155. | 665. | 582. | 1287. | 2676. | 0.0000  | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1214. |
| .0970 | -1655. | 152. | 771. | 696. | 1337. | 2826. | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1285. |
| .0980 | -1729. | 142. | 808. | 726. | 1422. | 2937. | 0.0000  | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 1342. |
| .0990 | -1777. | 135. | 771. | 685. | 1520. | 2985. | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 1372. |

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CONDITION 24

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ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | MEMBER | SEQUENCE | LOCATION | END | TYPE | RU | TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|---------|--------|----------|----------|-----|------|----|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| 49      | 1      | 68       |          |     |      |    | .1000      | -1749.  | 121.    | 697.    | 609.       | 1562.      | 2904.      | 0.0000  | -0.0000 | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 1346.        |
|         |        |          |          |     |      |    | .1010      | -1648.  | 80.     | 643.    | 545.       | 1537.      | 2691.      | 0.0000  | 0.0000  | -0.0000 | 0.0000   | -0.0000  | -0.0000  | 1263.        |
|         |        |          |          |     |      |    | .1020      | -1541.  | 19.     | 614.    | 515.       | 1517.      | 2427.      | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 1167.        |
|         |        |          |          |     |      |    | .1030      | -1471.  | -10.    | 548.    | 498.       | 1568.      | 2185.      | 0.0000  | -0.0000 | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 1098.        |
|         |        |          |          |     |      |    | .1040      | -1391.  | 25.     | 381.    | 449.       | 1649.      | 1929.      | 0.0000  | -0.0000 | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1034.        |
|         |        |          |          |     |      |    | .1050      | -1248.  | 24.     | 198.    | 337.       | 1662.      | 1572.      | 0.0000  | -0.0000 | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 928.         |
|         |        |          |          |     |      |    | .1060      | -1036.  | -103.   | 97.     | 163.       | 1563.      | 1087.      | 0.0000  | 0.0000  | 0.0000  | -0.0000  | -0.0000  | 0.0000   | 767.         |
|         |        |          |          |     |      |    | .1070      | -797.   | -285.   | 29.     | -44.       | 1407.      | 551.       | -0.0000 | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 607.         |
|         |        |          |          |     |      |    | .1080      | -525.   | -325.   | -177.   | -239.      | 1238.      | 32.        | -0.0000 | -0.0000 | 0.0000  | -0.0000  | 0.0000   | 0.0000   | 506.         |
|         |        |          |          |     |      |    | .1090      | -170.   | -201.   | -509.   | -380.      | 982.       | -516.      | -0.0000 | 0.0000  | 0.0000  | 0.0000   | 0.0000   | 0.0000   | 471.         |
|         |        |          |          |     |      |    | .1100      | 139.    | -358.   | -459.   | -430.      | 627.       | -1076.     | 0.0000  | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 529.         |
|         |        |          |          |     |      |    | .1110      | 471.    | -577.   | -300.   | -445.      | 172.       | -1647.     | -0.0000 | 0.0000  | 0.0000  | -0.0000  | -0.0000  | 0.0000   | 688.         |
|         |        |          |          |     |      |    | .1120      | 924.    | -479.   | -488.   | -502.      | -356.      | -2212.     | -0.0000 | -0.0000 | 0.0000  | -0.0000  | 0.0000   | 0.0000   | 921.         |
|         |        |          |          |     |      |    | .1130      | 1413.   | -314.   | -753.   | -597.      | -944.      | -2749.     | 0.0000  | -0.0000 | -0.0000 | -0.0000  | 0.0000   | 0.0000   | 1151.        |
|         |        |          |          |     |      |    | .1140      | 1813.   | -443.   | -678.   | -677.      | -1571.     | -3228.     | -0.0000 | -0.0000 | -0.0000 | -0.0000  | 0.0000   | 0.0000   | 1466.        |
|         |        |          |          |     |      |    | .1150      | 2142.   | -625.   | -487.   | -699.      | -2185.     | -3595.     | 0.0000  | -0.0000 | 0.0000  | -0.0000  | 0.0000   | 0.0000   | 1711.        |
|         |        |          |          |     |      |    | .1160      | 2480.   | -465.   | -571.   | -633.      | -2748.     | -3811.     | -0.0000 | 0.0000  | 0.0000  | 0.0000   | 0.0000   | 0.0000   | 1902.        |
|         |        |          |          |     |      |    | .1170      | 2773.   | -148.   | -716.   | -456.      | -3257.     | -3875.     | 0.0000  | 0.0000  | 0.0000  | 0.0000   | 0.0000   | 0.0000   | 2039.        |
|         |        |          |          |     |      |    | .1180      | 2840.   | -149.   | -434.   | -185.      | -3646.     | -3736.     | 0.0000  | 0.0000  | 0.0000  | 0.0000   | 0.0000   | 0.0000   | 2096.        |
|         |        |          |          |     |      |    | .1190      | 2703.   | -240.   | -45.    | 85.        | -3835.     | -3354.     | 0.0000  | 0.0000  | 0.0000  | -0.0000  | 0.0000   | 0.0000   | 2045.        |
|         |        |          |          |     |      |    | .1200      | 2518.   | 13.     | -63.    | 286.       | -3033.     | -2776.     | 0.0000  | -0.0000 | -0.0000 | -0.0000  | 0.0000   | 0.0000   | 1903.        |
|         |        |          |          |     |      |    | .1210      | 2299.   | 357.    | -196.   | 457.       | -3741.     | -2113.     | 0.0000  | -0.0000 | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1734.        |
|         |        |          |          |     |      |    | .1220      | 1942.   | 329.    | 93.     | 677.       | -3595.     | -1410.     | 0.0000  | 0.0000  | 0.0000  | -0.0000  | 0.0000   | -0.0000  | 1573.        |
|         |        |          |          |     |      |    | .1230      | 1427.   | 180.    | 572.    | 988.       | -3292.     | -576.      | -0.0000 | 0.0000  | 0.0000  | -0.0000  | 0.0000   | -0.0000  | 1399.        |
|         |        |          |          |     |      |    | .1240      | 839.    | 410.    | 698.    | 1359.      | -2760.     | 449.       | 0.0000  | 0.0000  | -0.0000 | -0.0000  | 0.0000   | 0.0000   | 1248.        |
|         |        |          |          |     |      |    | .1250      | 218.    | 829.    | 632.    | 1737.      | -2095.     | 1545.      | 0.0000  | -0.0000 | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 1256.        |
|         |        |          |          |     |      |    | .1260      | -422.   | 907.    | 870.    | 2046.      | -1468.     | 2511.      | 0.0000  | -0.0000 | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1427.        |
|         |        |          |          |     |      |    | .1270      | -980.   | 717.    | 1254.   | 2199.      | -941.      | 3240.      | 0.0000  | 0.0000  | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1616.        |
|         |        |          |          |     |      |    | .1280      | -1359.  | 720.    | 1281.   | 2185.      | -467.      | 3761.      | 0.0000  | -0.0000 | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 1755.        |
|         |        |          |          |     |      |    | .1290      | -1624.  | 876.    | 1065.   | 2098.      | -2.        | 4123.      | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 1857.        |
|         |        |          |          |     |      |    | .1300      | -1890.  | 812.    | 1087.   | 2063.      | 442.       | 4333.      | 0.0000  | 0.0000  | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1934.        |
|         |        |          |          |     |      |    | .1310      | -2098.  | 624.    | 1277.   | 2111.      | 811.       | 4352.      | 0.0000  | 0.0000  | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1968.        |
|         |        |          |          |     |      |    | .1320      | -2084.  | 664.    | 1202.   | 2153.      | 1045.      | 4114.      | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 1910.        |
|         |        |          |          |     |      |    | .1330      | -1856.  | 794.    | 931.    | 2073.      | 1126.      | 3594.      | 0.0000  | 0.0000  | 0.0000  | -0.0000  | -0.0000  | -0.0000  | 1725.        |
|         |        |          |          |     |      |    | .1340      | -1565.  | 609.    | 824.    | 1791.      | 1111.      | 2838.      | 0.0000  | -0.0000 | -0.0000 | 0.0000   | -0.0000  | -0.0000  | 1419.        |
|         |        |          |          |     |      |    | .1350      | -1256.  | 207.    | 770.    | 1301.      | 1088.      | 1941.      | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 1034.        |
|         |        |          |          |     |      |    | .1360      | -875.   | -2.     | 415.    | 704.       | 1101.      | 984.       | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 656.         |
|         |        |          |          |     |      |    | .1370      | -454.   | -56.    | -70.    | 169.       | 1128.      | 3.         | 0.0000  | -0.0000 | -0.0000 | -0.0000  | 0.0000   | 0.0000   | 458.         |

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CONDITION 24

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PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |      |       |       |       |       |        |         |         |         |         |         |       |
|-------|--------|------|-------|-------|-------|-------|--------|---------|---------|---------|---------|---------|-------|
| .1270 | -920.  | 717. | 1254. | 2199. | -941. | 3240. | .0000  | 0.0000  | -0.0000 | -0.0000 | .0000   | -0.0000 | 1427. |
| .1280 | -1359. | 720. | 1281. | 2185. | -467. | 3761. | .0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1755. |
| .1290 | -1624. | 876. | 1065. | 2098. | -2.   | 4123. | .0000  | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1857. |
| .1300 | -1890. | 812. | 1017. | 2067. | 442.  | 4333. | .0000  | 0.0000  | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 1934. |
| .1310 | -2098. | 624. | 1277. | 2111. | 911.  | 4352. | .0000  | .0000   | -0.0000 | -0.0000 | .0000   | -0.0000 | 1968. |
| .1320 | -2084. | 684. | 1202. | 2153. | 1045. | 4114. | .0000  | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1910. |
| .1330 | -1856. | 794. | 931.  | 2073. | 1126. | 3594. | .0000  | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | 1725. |
| .1340 | -1565. | 609. | 824.  | 1791. | 1111. | 2838. | .0000  | -0.0000 | -0.0000 | .0000   | -0.0000 | -0.0000 | 1419. |
| .1350 | -1256. | 207. | 770.  | 1301. | 1088. | 1941. | .0000  | 0.0000  | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 1034. |
| .1360 | -875.  | -2.  | 415.  | 704.  | 1101. | 984.  | 0.0000 | .0000   | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 656.  |
| .1370 | -454.  | -56. | -70.  | 169.  | 1128. | 3.    | .0000  | -0.0000 | -0.0000 | -0.0000 | .0000   | .0000   | 458.  |

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ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49     | MEMBER | 1      | SEQUENCE | 68      | LOCATION | END     | TYPE    | RU      |         |         |         |        |  |
|---------|--------|--------|--------|----------|---------|----------|---------|---------|---------|---------|---------|---------|--------|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX      | DY      | DZ      | RX      | RY      | RZ      | STRESS |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)    | (IN)    | (IN)    | (DEG)   | (DEG)   | (DEG)   | (PSI)  |  |
| .1380   | -91.   | -264.  | -255.  | -182.    | 1136.   | -974.    | -0.0000 | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | 605.   |  |
| .1390   | 232.   | -550.  | -244.  | -393.    | 1121.   | -1923.   | -0.0000 | 0.0000  | .0000   | -0.0000 | -0.0000 | 0.0000  | 907.   |  |
| .1400   | 586.   | -676.  | -442.  | -622.    | 1119.   | -2812.   | -0.0000 | -0.0000 | .0000   | -0.0000 | 0.0000  | 0.0000  | 1240.  |  |
| .1410   | 898.   | -657.  | -794.  | -993.    | 1188.   | -3581.   | -0.0000 | .0000   | .0000   | .0000   | .0000   | 0.0000  | 1566.  |  |
| .1420   | 1030.  | -932.  | -973.  | -1507.   | 1377.   | -4165.   | -0.0000 | .0000   | .0000   | .0000   | -0.0000 | 0.0000  | 1861.  |  |
| .1430   | 995.   | -1311. | -1040. | -2042.   | 1679.   | -4519.   | -0.0000 | -0.0000 | .0000   | .0000   | -0.0000 | 0.0000  | 2101.  |  |
| .1440   | 922.   | -1424. | -1251. | -2425.   | 2019.   | -4862.   | -0.0000 | -0.0000 | .0000   | .0000   | -0.0000 | .0000   | 2259.  |  |
| .1450   | 836.   | -1326. | -1442. | -2528.   | 2302.   | -4636.   | -0.0000 | -0.0000 | .0000   | -0.0000 | .0000   | .0000   | 2312.  |  |
| .1460   | 667.   | -1324. | -1299. | -2364.   | 2508.   | -4455.   | -0.0000 | -0.0000 | .0000   | .0000   | .0000   | .0000   | 2260.  |  |
| .1470   | 402.   | -1386. | -986.  | -2099.   | 2703.   | -4090.   | -0.0000 | .0000   | .0000   | .0000   | -0.0000 | 0.0000  | 2140.  |  |
| .1480   | 71.    | -1278. | -881.  | -1907.   | 2968.   | -3497.   | -0.0000 | .0000   | .0000   | .0000   | 0.0000  | .0000   | 1993.  |  |
| .1490   | -333.  | -1086. | -929.  | -1834.   | 3298.   | -2701.   | -0.0000 | 0.0000  | .0000   | .0000   | -0.0000 | .0000   | 1862.  |  |
| .1500   | -801.  | -1046. | -812.  | -1778.   | 3585.   | -1807.   | -0.0000 | 0.0000  | .0000   | .0000   | .0000   | 0.0000  | 1762.  |  |
| .1510   | -1235. | -1058. | -526.  | -1588.   | 3723.   | -911.    | -0.0000 | -0.0000 | 0.0000  | .0000   | -0.0000 | .0000   | 1665.  |  |
| .1520   | -1568. | -866.  | -284.  | -1175.   | 3714.   | -24.     | -0.0000 | .0000   | .0000   | .0000   | -0.0000 | .0000   | 1563.  |  |
| .1530   | -1877. | -515.  | -55.   | -558.    | 3650.   | 911.     | -0.0000 | -0.0000 | 0.0000  | .0000   | -0.0000 | .0000   | 1526.  |  |
| .1540   | -2252. | -237.  | 302.   | 139.     | 3605.   | 1905.    | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | -0.0000 | 1637.  |  |
| .1550   | -2634. | -36.   | 665.   | 750.     | 3560.   | 2875.    | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 1861.  |  |
| .1560   | -2899. | 210.   | 834.   | 1178.    | 3442.   | 3705.    | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | 2084.  |  |
| .1570   | -3021. | 423.   | 900.   | 1443.    | 3204.   | 4319.    | .0000   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2234.  |  |
| .1580   | -3057. | 476.   | 1075.  | 1653.    | 2859.   | 4724.    | .0000   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2313.  |  |
| .1590   | -3032. | 509.   | 1274.  | 1897.    | 2476.   | 4980.    | .0000   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2358.  |  |
| .1600   | -2923. | 674.   | 1335.  | 2186.    | 2091.   | 5101.    | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2380.  |  |
| .1610   | -2731. | 896.   | 1306.  | 2463.    | 1693.   | 5051.    | .0000   | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 0.0000  | 2355.  |  |
| .1620   | -2446. | 951.   | 1327.  | 2637.    | 1226.   | 4762.    | .0000   | -0.0000 | -0.0000 | .0000   | -0.0000 | .0000   | 2239.  |  |
| .1630   | -2026. | 871.   | 1334.  | 2621.    | 659.    | 4188.    | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2000.  |  |
| .1640   | -1470. | 777.   | 1184.  | 2398.    | 34.     | 3385.    | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1665.  |  |
| .1650   | -862.  | 683.   | 925.   | 2040.    | -571.   | 2459.    | .0000   | .0000   | .0000   | -0.0000 | .0000   | -0.0000 | 1302.  |  |
| .1660   | -273.  | 524.   | 702.   | 1650.    | -1122.  | 1484.    | .0000   | .0000   | -0.0000 | -0.0000 | .0000   | -0.0000 | 998.   |  |
| .1670   | 302.   | 350.   | 523.   | 1304.    | -1631.  | 484.     | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | 0.0000  | 860.   |  |
| .1680   | 898.   | 246.   | 305.   | 1006.    | -2125.  | -539.    | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 968.   |  |
| .1690   | 1499.  | 169.   | 71.    | 718.     | -2596.  | -1559.   | -0.0000 | -0.0000 | .0000   | -0.0000 | -0.0000 | .0000   | 1250.  |  |
| .1700   | 2038.  | 21.    | -106.  | 390.     | -2010.  | -2514.   | -0.0000 | .0000   | .0000   | -0.0000 | .0000   | 0.0000  | 1582.  |  |
| .1710   | 2458.  | -180.  | -254.  | 3.       | -3290.  | -3312.   | -0.0000 | .0000   | .0000   | .0000   | .0000   | .0000   | 1873.  |  |
| .1720   | 2719.  | -328.  | -445.  | -401.    | -3378.  | -3855.   | -0.0000 | -0.0000 | .0000   | 0.0000  | .0000   | .0000   | 2063.  |  |
| .1730   | 2814.  | -402.  | -643.  | -749.    | -3284.  | -4120.   | -0.0000 | .0000   | .0000   | .0000   | .0000   | .0000   | 2135.  |  |
| .1740   | 2757.  | -459.  | -738.  | -970.    | -3065.  | -4137.   | .0000   | .0000   | .0000   | -0.0000 | -0.0000 | 0.0000  | 2102.  |  |
| .1750   | 2572.  | -508.  | -706.  | -1040.   | -2758.  | -3932.   | -0.0000 | .0000   | .0000   | .0000   | .0000   | .0000   | 1972.  |  |

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CONDITION 24

LOADS

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ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |       |       |        |        |        |        |        |        |        |        |        |       |
|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| .1650 | -262. | 683.  | 925.  | 2040.  | -571.  | 2459.  | .0000  | .0000  | .0000  | -.0000 | .0000  | -.0000 | 1302. |
| .1660 | -273. | 524.  | 702.  | 1650.  | -1122. | 1454.  | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 998.  |
| .1670 | 302.  | 350.  | 523.  | 1304.  | -1671. | 484.   | .0000  | -.0000 | -.0000 | -.0000 | .0000  | 0.0000 | 860.  |
| .1680 | 898.  | 246.  | 305.  | 1006.  | -2117. | -539.  | .0000  | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 568.  |
| .1690 | 1495. | 189.  | 71.   | 710.   | -2596. | -1559. | -.0000 | -.0000 | .0000  | -.0000 | -.0000 | .0000  | 1250. |
| .1700 | 2038. | 21.   | -100. | 390.   | -3010. | -2514. | -.0000 | .0000  | .0000  | -.0000 | .0000  | 0.0000 | 1582. |
| .1710 | 2458. | -180. | -254. | 3.     | -3290. | -3312. | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 1873. |
| .1720 | 2719. | -328. | -445. | -401.  | -3378. | -2855. | -.0000 | -.0000 | .0000  | 0.0000 | .0000  | .0000  | 2063. |
| .1730 | 2814. | -402. | -643. | -749.  | -3284. | -4120. | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 2135. |
| .1740 | 2757. | -459. | -730. | -970.  | -3065. | -4177. | .0000  | .0000  | .0000  | -.0000 | -.0000 | 0.0000 | 2102. |
| .1750 | 2572. | -508. | -706. | -1040. | -2758. | -3932. | -.0000 | .0000  | .0000  | .0000  | .0000  | .0000  | 1972. |

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ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.02.

S/RV PIPING KEWAUNEE GRW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION    | 49      | MEMBER  | 1       | SEQUENCE   | 68         | LOCATION   | END     | TYPE    | RU      |          |          |          |              |  |  |
|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|--|--|
| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |  |  |
| .1760      | 2268.   | -492.   | -636.   | -994.      | -2349.     | -3501.     | 0.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 1738.        |  |  |
| .1770      | 1833.   | -404.   | -573.   | -078.      | -1011.     | -2828.     | -.0000  | -.0000  | .0000   | .0000    | .0000    | .0000    | 1393.        |  |  |
| .1780      | 1266.   | -307.   | -476.   | -728.      | -1157.     | -1938.     | -.0000  | -.0000  | .0000   | .0000    | .0000    | .0000    | 952.         |  |  |
| .1790      | 601.    | -229.   | -320.   | -551.      | -435.      | -888.      | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 454.         |  |  |
| .1800      | -94.    | -121.   | -153.   | -341.      | 295.       | 245.       | -.0000  | -.0000  | .0000   | .0000    | -.0000   | 0.0000   | 206.         |  |  |
| .1810      | -764.   | 33.     | 2.      | -93.       | 978.       | 1386.      | .0000   | .0000   | .0000   | .0000    | -.0000   | -.0000   | 682.         |  |  |
| .1820      | -1389.  | 108.    | 185.    | 191.       | 1587.      | 2479.      | .0000   | .0000   | .0000   | .0000    | -.0000   | 0.0000   | 1184.        |  |  |
| .1830      | -1953.  | 316.    | 396.    | 485.       | 2111.      | 3474.      | .0000   | -.0000  | -.0000  | .0000    | 0.0000   | 0.0000   | 1643.        |  |  |
| .1840      | -2419.  | 450.    | 563.    | 756.       | 2538.      | 4324.      | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | 2035.        |  |  |
| .1850      | -2764.  | 594.    | 667.    | 980.       | 2856.      | 4989.      | .0000   | .0000   | -.0000  | 0.0000   | -.0000   | .0000    | 2340.        |  |  |
| .1860      | -2983.  | 691.    | 758.    | 1147.      | 3045.      | 5433.      | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | 2541.        |  |  |
| .1870      | -3064.  | 730.    | 842.    | 1245.      | 3095.      | 5632.      | 0.0000  | -.0000  | -.0000  | .0000    | -.0000   | -.0000   | 2627.        |  |  |
| .1880      | -2988.  | 752.    | 852.    | 1248.      | 3007.      | 5569.      | .0000   | -.0000  | -.0000  | .0000    | -.0000   | -.0000   | 2589.        |  |  |
| .1890      | -2770.  | 754.    | 778.    | 1144.      | 2810.      | 5258.      | .0000   | 0.0000  | -.0000  | -.0000   | 0.0000   | -.0000   | 2436.        |  |  |
| .1900      | -2461.  | 683.    | 681.    | 945.       | 2545.      | 4742.      | .0000   | 0.0000  | -.0000  | .0000    | -.0000   | 0.0000   | 2193.        |  |  |
| .1910      | -2089.  | 546.    | 573.    | 679.       | 2242.      | 4059.      | .0000   | -.0000  | -.0000  | -.0000   | -.0000   | -.0000   | 1880.        |  |  |
| .1920      | -1650.  | 415.    | 407.    | 371.       | 1906.      | 3238.      | .0000   | .0000   | .0000   | .0000    | -.0000   | -.0000   | 1515.        |  |  |
| .1930      | -1153.  | 300.    | 199.    | 55.        | 1535.      | 2306.      | .0000   | .0000   | -.0000  | .0000    | -.0000   | -.0000   | 1112.        |  |  |
| .1940      | -634.   | 147.    | 15.     | -273.      | 1142.      | 1306.      | 0.0000  | .0000   | .0000   | .0000    | -.0000   | 0.0000   | 705.         |  |  |
| .1950      | -130.   | -55.    | -144.   | -628.      | 761.       | 295.       | -.0000  | .0000   | 0.0000  | .0000    | -.0000   | -.0000   | 413.         |  |  |
| .1960      | 335.    | -255.   | -334.   | -1021.     | 429.       | -664.      | -.0000  | -.0000  | .0000   | .0000    | -.0000   | .0000    | 518.         |  |  |
| .1970      | 736.    | -436.   | -551.   | -1429.     | 163.       | -1522.     | -.0000  | .0000   | .0000   | .0000    | -.0000   | .0000    | 840.         |  |  |
| .1980      | 1064.   | -616.   | -730.   | -1795.     | -54.       | -2255.     | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 1157.        |  |  |
| .1990      | 1330.   | -773.   | -845.   | -2058.     | -          | -2858.     | -.0000  | -.0000  | .0000   | .0000    | .0000    | .0000    | 1417.        |  |  |
| .2000      | 1544.   | -867.   | -909.   | -2187.     | -464.      | -3316.     | -.0000  | -.0000  | .0000   | .0000    | 0.0000   | .0000    | 1605.        |  |  |
| .2010      | 1685.   | -901.   | -920.   | -2190.     | -640.      | -3595.     | 0.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 1709.        |  |  |
| .2020      | 1724.   | -902.   | -875.   | -2102.     | -784.      | -3666.     | -.0000  | .0000   | .0000   | .0000    | -.0000   | 0.0000   | 1725.        |  |  |
| .2030      | 1663.   | -875.   | -796.   | -1960.     | -866.      | -3531.     | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 1657.        |  |  |
| .2040      | 1521.   | -809.   | -707.   | -1774.     | -906.      | -3212.     | 0.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 1517.        |  |  |
| .2050      | 1318.   | -713.   | -583.   | -1522.     | -927.      | -2745.     | -.0000  | 0.0000  | .0000   | .0000    | .0000    | .0000    | 1313.        |  |  |
| .2060      | 1064.   | -594.   | -395.   | -1167.     | -943.      | -2157.     | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 1054.        |  |  |
| .2070      | 728.    | -475.   | -155.   | -697.      | -951.      | -1468.     | -.0000  | .0000   | .0000   | .0000    | .0000    | .0000    | 756.         |  |  |
| .2080      | 439.    | -227.   | 102.    | -141.      | -936.      | -700.      | -.0000  | 0.0000  | 0.0000  | .0000    | .0000    | -.0000   | 473.         |  |  |
| .2090      | 85.     | 1.      | 357.    | 440.       | -893.      | 110.       | -.0000  | .0000   | .0000   | -.0000   | -.0000   | -.0000   | 402.         |  |  |
| .2100      | -271.   | 204.    | 607.    | 982.       | -834.      | 905.       | .0000   | -.0000  | -.0000  | -.0000   | .0000    | -.0000   | 632.         |  |  |
| .2110      | -601.   | 364.    | 833.    | 1439.      | -775.      | 1629.      | .0000   | -.0000  | -.0000  | -.0000   | .0000    | -.0000   | 926.         |  |  |
| .2120      | -804.   | 492.    | 1012.   | 1807.      | -722.      | 2246.      | .0000   | -.0000  | -.0000  | -.0000   | .0000    | -.0000   | 1191.        |  |  |
| .2130      | -1109.  | 595.    | 1146.   | 2058.      | -681.      | 2728.      | 0.0000  | .0000   | -.0000  | -.0000   | .0000    | -.0000   | 1405.        |  |  |

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ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEWAUNEE GRW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |       |       |        |       |        |        |         |         |         |         |         |         |       |
|-------|--------|-------|-------|--------|-------|--------|--------|---------|---------|---------|---------|---------|---------|-------|
| .2030 | 1667.  | -875. | -796. | -1960. | -866. | -3531. | -0.000 | .0000   | .0000   | .0000   | .0000   | .0000   | .0000   | 1657. |
| .2040 | 1521.  | -809. | -707. | -1774. | -906. | -3212. | 0.0000 | .0000   | .0000   | .0000   | .0000   | .0000   | .0000   | 1517. |
| .2050 | 1318.  | -713. | -583. | -1522. | -927. | -2745. | -0.000 | 0.0000  | .0000   | .0000   | .0000   | .0000   | .0000   | 1313. |
| .2060 | 1064.  | -594. | -395. | -1167. | -943. | -2157. | -0.000 | .0000   | .0000   | .0000   | .0000   | .0000   | .0000   | 1054. |
| .2070 | 767.   | -435. | -155. | -697.  | -651. | -1468. | -0.000 | .0000   | .0000   | .0000   | .0000   | .0000   | .0000   | 756.  |
| .2080 | 439.   | -227. | 102.  | -141.  | -676. | -730.  | -0.000 | 0.0000  | 0.0000  | .0000   | .0000   | .0000   | -0.0000 | 473.  |
| .2090 | 85.    | 1.    | 357.  | 440.   | -893. | 110.   | -0.000 | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 402.  |
| .2100 | -271.  | 204.  | 607.  | 982.   | -834. | 909.   | .0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 632.  |
| .2110 | -601.  | 364.  | 833.  | 1439.  | -775. | 1629.  | .0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 926.  |
| .2120 | -824.  | 492.  | 1012. | 1801.  | -722. | 2246.  | .0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1191. |
| .2130 | -1106. | 595.  | 1146. | 2098.  | -681. | 2728.  | 0.0000 | .0000   | -0.0000 | -0.0000 | .0000   | -0.0000 | -0.0000 | 1405. |

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ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49     | MEMBER | 1     | SEQUENCE | 68      | LOCATIO | END     | TYPE    | RU      |         |         |         |       |  |        |
|---------|--------|--------|-------|----------|---------|---------|---------|---------|---------|---------|---------|---------|-------|--|--------|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ      |         |         |         |         |         |         |       |  | STRESS |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB) | (IN)    | (IN)    | (IN)    | (DEG)   | (DEG)   | (DEG)   | (PSI) |  |        |
| .2140   | -1264. | 669.   | 1252. | 2319.    | -658.   | 3051.   | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | -0.0000 | 1560. |  |        |
| .2150   | -1340. | 711.   | 1329. | 2492.    | -661.   | 3192.   | .0000   | .0000   | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 1647. |  |        |
| .2160   | -1328. | 721.   | 1355. | 2583.    | -691.   | 3139.   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1655. |  |        |
| .2170   | -1232. | 692.   | 1317. | 2557.    | -737.   | 2900.   | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | -0.0000 | 1579. |  |        |
| .2180   | -1066. | 607.   | 1220. | 2393.    | -792.   | 2487.   | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | -0.0000 | 1421. |  |        |
| .2190   | -834.  | 467.   | 1071. | 2099.    | -855.   | 1919.   | .0000   | .0000   | 0.0000  | -0.0000 | .0000   | -0.0000 | 1192. |  |        |
| .2200   | -543.  | 295.   | 875.  | 1700.    | -931.   | 1223.   | .0000   | .0000   | -0.0000 | -0.0000 | .0000   | -0.0000 | 922.  |  |        |
| .2210   | -213.  | 109.   | 652.  | 1265.    | -1009.  | 442.    | .0000   | .0000   | 0.0000  | -0.0000 | .0000   | -0.0000 | 673.  |  |        |
| .2220   | 119.   | -82.   | 423.  | 813.     | -1062.  | -361.   | .0000   | .0000   | .0000   | -0.0000 | .0000   | 0.0000  | 556.  |  |        |
| .2230   | 424.   | -265.  | 197.  | 373.     | -1072.  | -1131.  | 0.0000  | 0.0000  | .0000   | -0.0000 | .0000   | .0000   | 643.  |  |        |
| .2240   | 697.   | -427.  | -29.  | -47.     | -1043.  | -1838.  | 0.0000  | .0000   | .0000   | .0000   | .0000   | .0000   | 848.  |  |        |
| .2250   | 935.   | -575.  | -245. | -446.    | -989.   | -2462.  | 0.0000  | .0000   | .0000   | -0.0000 | .0000   | .0000   | 1080. |  |        |
| .2260   | 1118.  | -716.  | -428. | -615.    | -904.   | -2969.  | 0.0000  | .0000   | .0000   | .0000   | .0000   | .0000   | 1288. |  |        |
| .2270   | 1213.  | -833.  | -577. | -1123.   | -762.   | -3300.  | -0.0000 | 0.0000  | .0000   | .0000   | .0000   | 0.0000  | 1433. |  |        |
| .2280   | 1207.  | -897.  | -701. | -1372.   | -550.   | -3422.  | -0.0000 | .0000   | .0000   | .0000   | .0000   | .0000   | 1496. |  |        |
| .2290   | 1109.  | -904.  | -785. | -1506.   | -291.   | -3338.  | 0.0000  | .0000   | .0000   | -0.0000 | .0000   | .0000   | 1474. |  |        |
| .2300   | 935.   | -872.  | -800. | -1520.   | -16.    | -3075.  | -0.0000 | .0000   | .0000   | .0000   | .0000   | .0000   | 1376. |  |        |
| .2310   | 699.   | -804.  | -748. | -1420.   | 258.    | -2650.  | 0.0000  | 0.0000  | .0000   | .0000   | 0.0000  | 0.0000  | 1211. |  |        |
| .2320   | 401.   | -683.  | -662. | -1227.   | 545.    | -2065.  | -0.0000 | -0.0000 | .0000   | .0000   | .0000   | .0000   | 988.  |  |        |
| .2330   | 40.    | -521.  | -555. | -968.    | 850.    | -1331.  | -0.0000 | -0.0000 | .0000   | .0000   | -0.0000 | .0000   | 743.  |  |        |
| .2340   | -369.  | -346.  | -411. | -663.    | 1161.   | -487.   | -0.0000 | 0.0000  | .0000   | .0000   | -0.0000 | .0000   | 571.  |  |        |
| .2350   | -799.  | -173.  | -234. | -325.    | 1451.   | 416.    | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | .0000   | 620.  |  |        |
| .2360   | -1222. | 18.    | -53.  | 35.      | 1709.   | 1332.   | -0.0000 | -0.0000 | .0000   | -0.0000 | -0.0000 | .0000   | 870.  |  |        |
| .2370   | -1627. | 225.   | 118.  | 409.     | 1937.   | 2233.   | -0.0000 | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1197. |  |        |
| .2380   | -2008. | 422.   | 292.  | 762.     | 2133.   | 3083.   | -0.0000 | .0000   | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 1537. |  |        |
| .2390   | -2346. | 588.   | 470.  | 1136.    | 2288.   | 3840.   | 0.0000  | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 1851. |  |        |
| .2400   | -2627. | 727.   | 626.  | 1446.    | 2400.   | 4474.   | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 2119. |  |        |
| .2410   | -2851. | 845.   | 738.  | 1691.    | 2485.   | 4979.   | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | .0000   | 2334. |  |        |
| .2420   | -3030. | 938.   | 799.  | 1857.    | 2563.   | 5359.   | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2498. |  |        |
| .2430   | -3158. | 987.   | 827.  | 1939.    | 2627.   | 5600.   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2601. |  |        |
| .2440   | -3217. | 982.   | 822.  | 1940.    | 2655.   | 5676.   | -0.0000 | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2632. |  |        |
| .2450   | -3210. | 931.   | 796.  | 1872.    | 2647.   | 5595.   | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2595. |  |        |
| .2460   | -3162. | 858.   | 737.  | 1752.    | 2638.   | 5402.   | .0000   | .0000   | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 2513. |  |        |
| .2470   | -3107. | 789.   | 621.  | 1597.    | 2659.   | 5152.   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2413. |  |        |
| .2480   | -3041. | 715.   | 487.  | 1420.    | 2695.   | 4852.   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2299. |  |        |
| .2490   | -2935. | 599.   | 378.  | 1229.    | 2684.   | 4471.   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2150. |  |        |
| .2500   | -2784. | 451.   | 290.  | 1026.    | 2614.   | 4021.   | 0.0000  | .0000   | .0000   | -0.0000 | -0.0000 | -0.0000 | 1968. |  |        |
| .2510   | -2620. | 310.   | 183.  | 817.     | 2524.   | 3586.   | .0000   | .0000   | .0000   | -0.0000 | -0.0000 | 0.0000  | 1784. |  |        |

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ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |      |      |       |       |       |        |        |        |        |        |        |       |
|-------|--------|------|------|-------|-------|-------|--------|--------|--------|--------|--------|--------|-------|
| .2400 | -2727. | 777. | 777. | 1446. | 2400. | 4474. | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2119. |
| .2410 | -2851. | 845. | 728. | 1691. | 2485. | 4979. | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2334. |
| .2420 | -3030. | 978. | 799. | 1857. | 2563. | 5359. | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2498. |
| .2430 | -3159. | 987. | 823. | 1939. | 2627. | 5600. | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2601. |
| .2440 | -3217. | 982. | 822. | 1940. | 2655. | 5676. | -.0000 | 0.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2632. |
| .2450 | -3210. | 931. | 706. | 1872. | 2642. | 5595. | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2595. |
| .2460 | -3162. | 856. | 727. | 1752. | 2638. | 5402. | .0000  | -.0000 | -.0000 | -.0000 | 0.0000 | 0.0000 | 2513. |
| .2470 | -3107. | 789. | 621. | 1597. | 2659. | 5152. | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2413. |
| .2480 | -3041. | 715. | 487. | 1420. | 2695. | 4852. | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2299. |
| .2490 | -2935. | 599. | 378. | 1229. | 2684. | 4471. | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 2150. |
| .2500 | -2784. | 451. | 290. | 1020. | 2614. | 4021. | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 1968. |
| .2510 | -2620. | 318. | 183. | 817.  | 2524. | 3566. | .0000  | .0000  | .0000  | -.0000 | -.0000 | 0.0000 | 1784. |

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S/RV PIPING KEWAUNEE SKM00F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49     | MEMBER | 1     | SEQUENCE | 68      | LOCATION | END    | TYPE   | RU     |        |        |        |        |  |  |
|---------|--------|--------|-------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |  |
| .2520   | -2476. | 227.   | 49.   | 627.     | 2445.   | 3167.    | .0000  | .0000  | -.0000 | .0000  | -.0000 | .0000  | 1625.  |  |  |
| .2530   | -2352. | 166.   | -75.  | 482.     | 2361.   | 2832.    | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 1492.  |  |  |
| .2540   | -2235. | 125.   | -154. | 412.     | 2239.   | 2552.    | -.0000 | .0000  | .0000  | -.0000 | .0000  | -.0000 | 1373.  |  |  |
| .2550   | -2135. | 109.   | -179. | 429.     | 2084.   | 2348.    | .0000  | .0000  | .0000  | -.0000 | .0000  | -.0000 | 1272.  |  |  |
| .2560   | -2097. | 143.   | -179. | 528.     | 1956.   | 2288.    | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 1226.  |  |  |
| .2570   | -2203. | 270.   | -209. | 691.     | 1970.   | 2484.    | .0000  | -.0000 | .0000  | -.0000 | -.0000 | 0.0000 | 1302.  |  |  |
| .2580   | -2489. | 438.   | -222. | 908.     | 2160.   | 2963.    | 0.0000 | .0000  | .0000  | -.0000 | -.0000 | -.0000 | 1516.  |  |  |
| .2590   | -2929. | 556.   | -125. | 1184.    | 2471.   | 3663.    | .0000  | .0000  | .0000  | -.0000 | -.0000 | -.0000 | 1836.  |  |  |
| .2600   | -3503. | 644.   | 68.   | 1525.    | 2889.   | 4559.    | 0.0000 | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 2251.  |  |  |
| .2610   | -4230. | 785.   | 270.  | 1937.    | 3464.   | 5691.    | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 2784.  |  |  |
| .2620   | -5131. | 997.   | 456.  | 2411.    | 4237.   | 7080.    | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 3449.  |  |  |
| .2630   | -6139. | 1205.  | 685.  | 2925.    | 5110.   | 8608.    | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 4185.  |  |  |
| .2640   | -7063. | 1308.  | 1024. | 3434.    | 5845.   | 10011.   | 0.0000 | -.0000 | -.0000 | .0000  | -.0000 | -.0000 | 4852.  |  |  |
| .2650   | -7793. | 1312.  | 1432. | 3895.    | 6323.   | 11143.   | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 5374.  |  |  |
| .2660   | -8321. | 1335.  | 1760. | 4269.    | 6581.   | 12021.   | .0000  | .0000  | -.0000 | -.0000 | -.0000 | 0.0000 | 5760.  |  |  |
| .2670   | -8623. | 1431.  | 1936. | 4542.    | 6616.   | 12616.   | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 0.0000 | 6000.  |  |  |
| .2680   | -8562. | 1487.  | 2074. | 4714.    | 6241.   | 12722.   | .0000  | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 5993.  |  |  |
| .2690   | -8025. | 1421.  | 2254. | 4785.    | 5307.   | 12168.   | .0000  | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 5663.  |  |  |
| .2700   | -7052. | 1314.  | 2385. | 4745.    | 3905.   | 11024.   | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | .0000  | 5065.  |  |  |
| .2710   | -5838. | 1300.  | 2317. | 4584.    | 2321.   | 9558.    | 0.0000 | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 4355.  |  |  |
| .2720   | -4534. | 1333.  | 2098. | 4301.    | 734.    | 7932.    | .0000  | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 3633.  |  |  |
| .2730   | -3152. | 1245.  | 1909. | 3904.    | -879.   | 6118.    | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 2934.  |  |  |
| .2740   | -1733. | 1021.  | 1776. | 3408.    | -2466.  | 4165.    | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 2376.  |  |  |
| .2750   | -465.  | 795.   | 1577. | 2837.    | -3762.  | 2347.    | .0000  | -.0000 | -.0000 | -.0000 | 0.0000 | -.0000 | 2112.  |  |  |
| .2760   | 410.   | 658.   | 1248. | 2227.    | -4459.  | 986.     | -.0000 | .0000  | 0.0000 | .0000  | -.0000 | 0.0000 | 2039.  |  |  |
| .2770   | 819.   | 542.   | 889.  | 1621.    | -4506.  | 160.     | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 1923.  |  |  |
| .2780   | 878.   | 344.   | 630.  | 1050.    | -4086.  | -287.    | .0000  | .0000  | .0000  | -.0000 | .0000  | -.0000 | 1697.  |  |  |
| .2790   | 671.   | 74.    | 477.  | 531.     | -3319.  | -436.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 1360.  |  |  |
| .2800   | 158.   | -179.  | 342.  | 65.      | -2155.  | -196.    | .0000  | -.0000 | .0000  | .0000  | .0000  | -.0000 | 869.   |  |  |
| .2810   | -687.  | -342.  | 156.  | -352.    | -573.   | 489.     | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 333.   |  |  |
| .2820   | -1709. | -430.  | -71.  | -723.    | 1213.   | 1447.    | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | 811.   |  |  |
| .2830   | -2648. | -529.  | -244. | -1040.   | 2843.   | 2354.    | -.0000 | .0000  | .0000  | .0000  | .0000  | 0.0000 | 1539.  |  |  |
| .2840   | -3356. | -681.  | -304. | -1284.   | 4101.   | 3024.    | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 2109.  |  |  |
| .2850   | -3838. | -806.  | -318. | -1466.   | 4991.   | 3488.    | -.0000 | -.0000 | .0000  | .0000  | .0000  | .0000  | 2510.  |  |  |
| .2860   | -4113. | -785.  | -408. | -1493.   | 5534.   | 3803.    | -.0000 | .0000  | .0000  | .0000  | -.0000 | .0000  | 2767.  |  |  |
| .2870   | -4105. | -628.  | -566. | -1468.   | 5695.   | 3879.    | -.0000 | -.0000 | .0000  | .0000  | .0000  | 0.0000 | 2828.  |  |  |
| .2880   | -3731. | -465.  | -662. | -1367.   | 5259.   | 3568.    | .0000  | .0000  | .0000  | .0000  | -.0000 | 0.0000 | 2620.  |  |  |
| .2890   | -3034. | -440.  | -629. | -1279.   | 4364.   | 2888.    | .0000  | -.0000 | 0.0000 | .0000  | -.0000 | .0000  | 2162.  |  |  |

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S/RV PIPING KEWAUNEE SKM00F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING

|       |        |       |       |        |        |       |        |        |        |        |        |        |       |
|-------|--------|-------|-------|--------|--------|-------|--------|--------|--------|--------|--------|--------|-------|
| .2790 | 671.   | 74.   | 477.  | 571.   | -3719. | -436. | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 1697. |
| .2800 | 158.   | -175. | 347.  | 65.    | -2155. | -192. | .0000  | -.0000 | .0000  | .0000  | .0000  | -.0000 | 869.  |
| .2810 | -687.  | -342. | 156.  | -352.  | -573.  | 489.  | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 333.  |
| .2820 | -1709. | -430. | -71.  | -723.  | 1213.  | 1447. | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | 811.  |
| .2830 | -2547. | -529. | -244. | -1040. | 2947.  | 2354. | -.0000 | .0000  | .0000  | .0000  | .0000  | 0.0000 | 1539. |
| .2840 | -3356. | -621. | -304. | -1214. | 4101.  | 3024. | .0000  | .0000  | .0000  | .0000  | .0000  | .0000  | 2109. |
| .2850 | -3638. | -806. | -318. | -1476. | 4991.  | 3488. | -.0000 | -.0000 | .0000  | .0000  | .0000  | .0000  | 2510. |
| .2860 | -4113. | -735. | -406. | -1493. | 5554.  | 3803. | -.0000 | .0000  | .0000  | .0000  | -.0000 | .0000  | 2767. |
| .2870 | -4105. | -628. | -506. | -1468. | 5699.  | 3879. | -.0000 | -.0000 | .0000  | .0000  | .0000  | 0.0000 | 2828. |
| .2880 | -3731. | -475. | -667. | -1317. | 5269.  | 3568. | .0000  | .0000  | .0000  | .0000  | -.0000 | 0.0000 | 2620. |
| .2890 | -3024. | -440. | -619. | -1179. | 4264.  | 2838. | .0000  | -.0000 | 0.0000 | .0000  | -.0000 | .0000  | 2162. |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DICK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49     | MEMBER | 1     | SEQUENCE | 68      | LOCATION | END    | TYPE   | RU     |        |        |        |       |  |        |
|---------|--------|--------|-------|----------|---------|----------|--------|--------|--------|--------|--------|--------|-------|--|--------|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       |        |        |        |        |        |        |       |  | STRESS |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI) |  |        |
| .2900   | -2178. | -395.  | -587. | -1167.   | 3165.   | 2057.    | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | 1586. |  |        |
| .2910   | -1323. | -228.  | -663. | -1051.   | 1940.   | 1291.    | .0000  | .0000  | .0000  | .0000  | -.0000 | 0.0000 | 1026. |  |        |
| .2920   | -533.  | 1.     | -783. | -907.    | 762.    | 644.     | .0000  | .0000  | .0000  | .0000  | .0000  | 0.0000 | 541.  |  |        |
| .2930   | 176.   | 145.   | -776. | -709.    | -301.   | 77.      | .0000  | .0000  | .0000  | .0000  | .0000  | -.0000 | 324.  |  |        |
| .2940   | 740.   | 186.   | -622. | -453.    | -1401.  | -343.    | .0000  | .0000  | .0000  | .0000  | -.0000 | -.0000 | 607.  |  |        |
| .2950   | 1038.  | 247.   | -468. | -168.    | -2102.  | -438.    | -.0000 | .0000  | .0000  | -.0000 | .0000  | -.0000 | 864.  |  |        |
| .2960   | 996.   | 386.   | -400. | 108.     | -2365.  | -107.    | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 951.  |  |        |
| .2970   | 675.   | 512.   | -342. | 346.     | -2232.  | 550.     | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 952.  |  |        |
| .2980   | 215.   | 531.   | -204. | 541.     | -2048.  | 1336.    | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 1005. |  |        |
| .2990   | -286.  | 474.   | -6.   | 708.     | -1776.  | 2148.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | 0.0000 | 1154. |  |        |
| .3000   | -807.  | 448.   | 162.  | 875.     | -1477.  | 2990.    | .0000  | 0.0000 | -.0000 | -.0000 | .0000  | -.0000 | 1383. |  |        |
| .3010   | -1304. | 503.   | 267.  | 1064.    | -1202.  | 3827.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 1685. |  |        |
| .3020   | -1650. | 601.   | 347.  | 1272.    | -1121.  | 4499.    | .0000  | 0.0000 | -.0000 | 0.0000 | .0000  | 0.0000 | 1929. |  |        |
| .3030   | -1705. | 678.   | 451.  | 1477.    | -1419.  | 4823.    | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 2103. |  |        |
| .3040   | -1434. | 718.   | 578.  | 1650.    | -2139.  | 4754.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | 0.0000 | 2194. |  |        |
| .3050   | -913.  | 769.   | 667.  | 1777.    | -3172.  | 4393.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 2288. |  |        |
| .3060   | -220.  | 886.   | 668.  | 1869.    | -4404.  | 3847.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 2464. |  |        |
| .3070   | 619.   | 1054.  | 618.  | 1958.    | -5798.  | 3140.    | 0.0000 | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 2760. |  |        |
| .3080   | 1571.  | 1200.  | 616.  | 2081.    | -7330.  | 2279.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 3192. |  |        |
| .3090   | 2530.  | 1295.  | 702.  | 2253.    | -8866.  | 1375.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | 0.0000 | 3712. |  |        |
| .3100   | 3341.  | 1397.  | 799.  | 2457.    | -10101. | 623.     | .0000  | -.0000 | 0.0000 | -.0000 | .0000  | -.0000 | 4210. |  |        |
| .3110   | 3884.  | 1553.  | 834.  | 2660.    | -11095. | 170.     | .0000  | .0000  | 0.0000 | -.0000 | .0000  | -.0000 | 4579. |  |        |
| .3120   | 4127.  | 1699.  | 850.  | 2833.    | -11566. | 28.      | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 4779. |  |        |
| .3130   | 4084.  | 1739.  | 935.  | 2969.    | -11631. | 140.     | 0.0000 | -.0000 | 0.0000 | -.0000 | -.0000 | -.0000 | 4817. |  |        |
| .3140   | 3765.  | 1681.  | 1087. | 3072.    | -11285. | 496.     | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 4697. |  |        |
| .3150   | 3157.  | 1617.  | 1214. | 3155.    | -10491. | 1129.    | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 4420. |  |        |
| .3160   | 2300.  | 1589.  | 1276. | 3231.    | -9289.  | 2000.    | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 4026. |  |        |
| .3170   | 1311.  | 1537.  | 1326. | 3258.    | -7838.  | 2951.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 3606. |  |        |
| .3180   | 337.   | 1400.  | 1406. | 3240.    | -6336.  | 3792.    | 0.0000 | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 3236. |  |        |
| .3190   | -530.  | 1200.  | 1470. | 3131.    | -4892.  | 4425.    | .0000  | -.0000 | -.0000 | .0000  | .0000  | -.0000 | 2930. |  |        |
| .3200   | -1259. | 999.   | 1445. | 2913.    | -3537.  | 4838.    | .0000  | -.0000 | -.0000 | 0.0000 | -.0000 | -.0000 | 2674. |  |        |
| .3210   | -1815. | 814.   | 1318. | 2590.    | -2723.  | 5004.    | .0000  | 0.0000 | -.0000 | -.0000 | .0000  | -.0000 | 2446. |  |        |
| .3220   | -2131. | 620.   | 1136. | 2186.    | -1354.  | 4846.    | .0000  | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | 2201. |  |        |
| .3230   | -2167. | 399.   | 529.  | 1729.    | -698.   | 4325.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 1890. |  |        |
| .3240   | -1968. | 168.   | 727.  | 1241.    | -312.   | 3511.    | .0000  | .0000  | -.0000 | .0000  | .0000  | -.0000 | 1499. |  |        |
| .3250   | -1637. | -78.   | 478.  | 735.     | -72.    | 2551.    | .0000  | -.0000 | -.0000 | -.0000 | .0000  | -.0000 | 1066. |  |        |
| .3260   | -1262. | -224.  | 186.  | 319.     | 121.    | 1570.    | .0000  | .0000  | -.0000 | -.0000 | .0000  | -.0000 | 638.  |  |        |
| .3270   | -862.  | -350.  | -104. | -300.    | 311.    | 624.     | .0000  | -.0000 | .0000  | -.0000 | .0000  | .0000  | 308.  |  |        |

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DICK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING



|       |        |       |       |       |       |        |       |        |         |         |         |         |         |       |
|-------|--------|-------|-------|-------|-------|--------|-------|--------|---------|---------|---------|---------|---------|-------|
| .2170 | 1311.  | 1237. | 1406. | 1406. | 3240. | -6736. | 3792. | 0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 3606. |
| .3180 | 337.   | 1400. | 1470. | 1470. | 2171. | -4892. | 4425. | 0.0000 | -0.0000 | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 2930. |
| .3190 | -530.  | 1200. | 1470. | 1470. | 2171. | -4892. | 4425. | 0.0000 | -0.0000 | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 2930. |
| .3200 | -1035. | 959.  | 1445. | 1445. | 2910. | -2577. | 4878. | 0.0000 | -0.0000 | -0.0000 | 0.0000  | -0.0000 | -0.0000 | 2674. |
| .3210 | -1015. | 814.  | 1315. | 1315. | 2590. | -2723. | 5004. | 0.0000 | 0.0000  | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 2446. |
| .3220 | -1131. | 690.  | 1136. | 1136. | 2186. | -1754. | 4846. | 0.0000 | 0.0000  | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 2201. |
| .3230 | -1167. | 359.  | 939.  | 939.  | 1720. | -695.  | 4325. | 0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 1890. |
| .3240 | -1968. | 168.  | 727.  | 727.  | 1241. | -212.  | 3511. | 0.0000 | 0.0000  | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 1499. |
| .3250 | -1637. | -38.  | 478.  | 478.  | 735.  | -72.   | 2551. | 0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 1066. |
| .3260 | -1262. | -304. | 184.  | 184.  | 219.  | 121.   | 1570. | 0.0000 | 0.0000  | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 638.  |
| .3270 | -752.  | -750. | -174. | -174. | -300. | 711.   | 634.  | 0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | -0.0000 | 308.  |

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DIS/ALLPIPE

ADLPIPE STRESS ANALYSIS

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18.29.02.

S/RV PIPING KEWAUNEE GKW00F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION    | 49      | MEMBER  | 1       | SEQUENCE   | 68         | LOCATION   | END | TYPE    | RU      |         |          |          |          |              |  |
|------------|---------|---------|---------|------------|------------|------------|-----|---------|---------|---------|----------|----------|----------|--------------|--|
| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) |     | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |  |
| .3280      | -579.   | -498.   | -408.   | -803.      | 544.       | -155.      |     | -0.0000 | 0.0000  | 0.0000  | -0.0000  | 0.0000   | 0.0000   | 396.         |  |
| .3290      | -407.   | -651.   | -641.   | -1263.     | 905.       | -730.      |     | 0.0000  | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 698.         |  |
| .3300      | -451.   | -775.   | -835.   | -1653.     | 1478.      | -1040.     |     | 0.0000  | 0.0000  | 0.0000  | 0.0000   | 0.0000   | 0.0000   | 983.         |  |
| .3310      | -725.   | -841.   | -1006.  | -1949.     | 2274.      | -934.      |     | -0.0000 | -0.0000 | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 1259.        |  |
| .3320      | -1188.  | -957.   | -1134.  | -2141.     | 3230.      | -506.      |     | -0.0000 | 0.0000  | 0.0000  | -0.0000  | -0.0000  | 0.0000   | 1568.        |  |
| .3330      | -1787.  | -854.   | -1189.  | -2226.     | 4263.      | 173.       |     | -0.0000 | -0.0000 | 0.0000  | -0.0000  | -0.0000  | 0.0000   | 1931.        |  |
| .3340      | -2470.  | -839.   | -1166.  | -2212.     | 5298.      | 1039.      |     | -0.0000 | 0.0000  | 0.0000  | -0.0000  | -0.0000  | 0.0000   | 2341.        |  |
| .3350      | -3182.  | -778.   | -1111.  | -2112.     | 6271.      | 2031.      |     | 0.0000  | -0.0000 | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 2778.        |  |
| .3360      | -3840.  | -658.   | -1048.  | -1940.     | 7084.      | 3052.      |     | -0.0000 | -0.0000 | 0.0000  | 0.0000   | 0.0000   | 0.0000   | 3192.        |  |
| .3370      | -4354.  | -503.   | -960.   | -1703.     | 7821.      | 3977.      |     | 0.0000  | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 3517.        |  |
| .3380      | -4657.  | -339.   | -828.   | -1409.     | 7799.      | 4708.      |     | -0.0000 | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 3699.        |  |
| .3390      | -4723.  | -156.   | -673.   | -1065.     | 7597.      | 5203.      |     | -0.0000 | -0.0000 | -0.0000 | 0.0000   | -0.0000  | 0.0000   | 3720.        |  |
| .3400      | -4354.  | 62.     | -524.   | -687.      | 7036.      | 5454.      |     | -0.0000 | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 3583.        |  |
| .3410      | -4175.  | 309.    | -389.   | -288.      | 6166.      | 5477.      |     | 0.0000  | 0.0000  | -0.0000 | 0.0000   | -0.0000  | -0.0000  | 3311.        |  |
| .3420      | -3628.  | 553.    | -202.   | 114.       | 5049.      | 5295.      |     | 0.0000  | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 2936.        |  |
| .3430      | -2967.  | 770.    | -102.   | 502.       | 3768.      | 4953.      |     | 0.0000  | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 2506.        |  |
| .3440      | -2267.  | 953.    | 55.     | 862.       | 2437.      | 4525.      |     | -0.0000 | -0.0000 | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 2091.        |  |
| .3450      | -1628.  | 1120.   | 193.    | 1186.      | 1208.      | 4124.      |     | 0.0000  | 0.0000  | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1789.        |  |
| .3460      | -1133.  | 1266.   | 309.    | 1472.      | 198.       | 3836.      |     | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 1651.        |  |
| .3470      | -818.   | 1368.   | 429.    | 1718.      | -537.      | 3692.      |     | 0.0000  | -0.0000 | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 1648.        |  |
| .3480      | -691.   | 1407.   | 567.    | 1924.      | -981.      | 3689.      |     | 0.0000  | 0.0000  | 0.0000  | -0.0000  | 0.0000   | 0.0000   | 1715.        |  |
| .3490      | -758.   | 1398.   | 707.    | 2085.      | -1112.     | 3838.      |     | 0.0000  | 0.0000  | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1809.        |  |
| .3500      | -1017.  | 1367.   | 817.    | 2195.      | -920.      | 4146.      |     | 0.0000  | 0.0000  | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 1918.        |  |
| .3510      | -1427.  | 1315.   | 887.    | 2239.      | -453.      | 4566.      |     | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 2049.        |  |
| .3520      | -1902.  | 1227.   | 930.    | 2212.      | 178.       | 4998.      |     | 0.0000  | 0.0000  | -0.0000 | -0.0000  | 0.0000   | -0.0000  | 2194.        |  |
| .3530      | -2343.  | 1089.   | 962.    | 2113.      | 841.       | 5322.      |     | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | -0.0000  | 2322.        |  |
| .3540      | -2887.  | 931.    | 960.    | 1949.      | 1460.      | 5481.      |     | 0.0000  | -0.0000 | -0.0000 | -0.0000  | 0.0000   | 0.0000   | 2407.        |  |
| .3550      | -2908.  | 800.    | 883.    | 1730.      | 2008.      | 5466.      |     | 0.0000  | 0.0000  | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 2438.        |  |
| .3560      | -2980.  | 703.    | 730.    | 1462.      | 2445.      | 5254.      |     | 0.0000  | -0.0000 | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 2398.        |  |
| .3570      | -2866.  | 606.    | 542.    | 1148.      | 2707.      | 4800.      |     | 0.0000  | -0.0000 | -0.0000 | 0.0000   | -0.0000  | 0.0000   | 2259.        |  |
| .3580      | -2555.  | 490.    | 303.    | 795.       | 2767.      | 4089.      |     | 0.0000  | -0.0000 | -0.0000 | 0.0000   | -0.0000  | 0.0000   | 2007.        |  |
| .3590      | -2090.  | 346.    | 140.    | 405.       | 2678.      | 3187.      |     | 0.0000  | -0.0000 | -0.0000 | -0.0000  | -0.0000  | 0.0000   | 1678.        |  |
| .3600      | -1534.  | 244.    | -110.   | -15.       | 2545.      | 2209.      |     | 0.0000  | -0.0000 | -0.0000 | 0.0000   | 0.0000   | -0.0000  | 1352.        |  |
| .3610      | -1026.  | 180.    | -420.   | -450.      | 2460.      | 1256.      |     | -0.0000 | -0.0000 | 0.0000  | -0.0000  | -0.0000  | 0.0000   | 1123.        |  |
| .3620      | -552.   | 116.    | -721.   | -883.      | 2460.      | 370.       |     | -0.0000 | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 1060.        |  |
| .3630      | -164.   | 15.     | -967.   | -1297.     | 2568.      | -398.      |     | -0.0000 | -0.0000 | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 1165.        |  |
| .3640      | 27.     | -110.   | -1170.  | -1680.     | 2742.      | -598.      |     | -0.0000 | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 1385.        |  |
| .3650      | 147.    | -178.   | -1978.  | -2036.     | 3035.      | -1041.     |     | -0.0000 | 0.0000  | 0.0000  | 0.0000   | -0.0000  | 0.0000   | 1665.        |  |

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DIS/ALLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.02.

S/RV PIPING KEWAUNEE GKW00F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING

|       |        |       |        |        |       |        |         |         |         |         |         |         |       |
|-------|--------|-------|--------|--------|-------|--------|---------|---------|---------|---------|---------|---------|-------|
| .3540 | -2627. | 911.  | 781.   | 1946.  | 1488. | 5481.  | .0000   | -0.0000 | -0.0000 | 0.0000  | 0.0000  | 0.0000  | 2407. |
| .3550 | -2908. | 800.  | 883.   | 1730.  | 2008. | 5466.  | .0000   | 0.0000  | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 2438. |
| .3560 | -2980. | 703.  | 733.   | 1462.  | 2445. | 5254.  | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 2398. |
| .3570 | -2866. | 606.  | 542.   | 1148.  | 2767. | 4800.  | .0000   | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 2259. |
| .3580 | -2555. | 470.  | 307.   | 795.   | 2767. | 4089.  | .0000   | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 2007. |
| .3590 | -2250. | 346.  | 146.   | 405.   | 2678. | 3197.  | .0000   | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 1678. |
| .3600 | -1554. | 244.  | -117.  | -15.   | 2545. | 2209.  | .0000   | -0.0000 | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 1352. |
| .3610 | -1024. | 180.  | -420.  | -450.  | 2450. | 1256.  | -0.0000 | -0.0000 | 0.0000  | -0.0000 | -0.0000 | 0.0000  | 1123. |
| .3620 | -552.  | 116.  | -721.  | -883.  | 2460. | 376.   | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1060. |
| .3630 | -164.  | 15.   | -967.  | -12-7. | 2568. | -398.  | -0.0000 | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1165. |
| .3640 | 27.    | -100. | -1172. | -1602. | 2640. | -998.  | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1385. |
| .3650 | 148.   | -188. | -1078. | -2030. | 2355. | -1241. | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1665. |

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S/RV PIPING KEWAUKEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 49     | MEMBER | 1      | SEQUENCE | 68      | LOCATION | END     | TYPE    | RU      |         |         |         |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|---------|---------|---------|---------|---------|---------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX      | DY      | DZ      | RX      | RY      | RZ      | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)    | (IN)    | (IN)    | (DEG)   | (DEG)   | (DEG)   | (PSI)  |  |  |
| .3660   | -3.    | -242.  | -1595. | -2368.   | 4124.   | -1399.   | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1989.  |  |  |
| .3670   | -328.  | -305.  | -1778. | -2674.   | 5082.   | -1225.   | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 2356.  |  |  |
| .3680   | -751.  | -417.  | -1882. | -2951.   | 6114.   | -919.    | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 2749.  |  |  |
| .3690   | -1214. | -549.  | -1934. | -3195.   | 7144.   | -537.    | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 3148.  |  |  |
| .3700   | -1683. | -638.  | -1994. | -3401.   | 8133.   | -99.     | 0.0000  | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 3538.  |  |  |
| .3710   | -2118. | -662.  | -2080. | -3567.   | 9026.   | 357.     | -0.0000 | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 3897.  |  |  |
| .3720   | -2437. | -689.  | -2145. | -3691.   | 9791.   | 721.     | 0.0000  | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 4175.  |  |  |
| .3730   | -2548. | -710.  | -2139. | -3782.   | 10026.  | 869.     | -0.0000 | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 4314.  |  |  |
| .3740   | -2430. | -758.  | -2099. | -3847.   | 9982.   | 786.     | -0.0000 | 0.0000  | 0.0000  | -0.0000 | -0.0000 | 0.0000  | 4304.  |  |  |
| .3750   | -2103. | -748.  | -2091. | -3887.   | 9642.   | 550.     | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 4178.  |  |  |
| .3760   | -1711. | -659.  | -2127. | -3890.   | 9081.   | 229.     | -0.0000 | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 3965.  |  |  |
| .3770   | -1170. | -549.  | -2139. | -3840.   | 8293.   | -189.    | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 3668.  |  |  |
| .3780   | -492.  | -438.  | -2055. | -3734.   | 7243.   | -753.    | -0.0000 | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 3284.  |  |  |
| .3790   | 285.   | -468.  | -1889. | -3592.   | 5991.   | -1419.   | 0.0000  | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 2859.  |  |  |
| .3800   | 1064.  | -413.  | -1732. | -3397.   | 4688.   | -2058.   | -0.0000 | 0.0000  | 0.0000  | -0.0000 | -0.0000 | 0.0000  | 2466.  |  |  |
| .3810   | 1745.  | -258.  | -1661. | -3185.   | 3489.   | -1539.   | -0.0000 | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 2152.  |  |  |
| .3820   | 2316.  | -70.   | -1604. | -2940.   | 2402.   | -2878.   | 0.0000  | 0.0000  | 0.0000  | -0.0000 | -0.0000 | 0.0000  | 1912.  |  |  |
| .3830   | 2827.  | 41.    | -1446. | -2659.   | 1347.   | -3177.   | -0.0000 | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1748.  |  |  |
| .3840   | 3267.  | 89.    | -1208. | -2346.   | 511.    | -3427.   | 0.0000  | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 1672.  |  |  |
| .3850   | 3565.  | 169.   | -997.  | -2012.   | -463.   | -3523.   | 0.0000  | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1639.  |  |  |
| .3860   | 3672.  | 317.   | -860.  | -1670.   | -1014.  | -3408.   | 0.0000  | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1576.  |  |  |
| .3870   | 3647.  | 448.   | -724.  | -1333.   | -1387.  | -3186.   | 0.0000  | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 1493.  |  |  |
| .3880   | 3608.  | 474.   | -509.  | -1016.   | -1739.  | -3029.   | 0.0000  | -0.0000 | 0.0000  | -0.0000 | -0.0000 | 0.0000  | 1460.  |  |  |
| .3890   | 3600.  | 421.   | -252.  | -727.    | -2111.  | -2990.   | -0.0000 | 0.0000  | 0.0000  | -0.0000 | -0.0000 | -0.0000 | 1498.  |  |  |
| .3900   | 3591.  | 385.   | -55.   | -470.    | -2436.  | -3008.   | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 1565.  |  |  |
| .3910   | 3569.  | 407.   | 45.    | -244.    | -2687.  | -3059.   | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 0.0000  | -0.0000 | 1637.  |  |  |
| .3920   | 3610.  | 414.   | 50.    | -50.     | -3068.  | -3256.   | -0.0000 | -0.0000 | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 1768.  |  |  |
| .3930   | 3800.  | 323.   | 243.   | 97.      | -3405.  | -3725.   | -0.0000 | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 2026.  |  |  |
| .3940   | 4122.  | 152.   | 389.   | 180.     | -3966.  | -4439.   | -0.0000 | -0.0000 | -0.0000 | 0.0000  | 0.0000  | 0.0000  | 2390.  |  |  |
| .3950   | 4481.  | -9.    | 458.   | 189.     | -4506.  | -5250.   | 0.0000  | -0.0000 | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 2777.  |  |  |
| .3960   | 4812.  | -121.  | 415.   | 170.     | -4935.  | -6066.   | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 0.0000  | 0.0000  | 3139.  |  |  |
| .3970   | 5136.  | -245.  | 341.   | 25.      | -5297.  | -6920.   | 0.0000  | 0.0000  | 0.0000  | -0.0000 | 0.0000  | 0.0000  | 3497.  |  |  |
| .3980   | 5472.  | -456.  | 231.   | -100.    | -5639.  | -7848.   | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 0.0000  | 3878.  |  |  |
| .3990   | 5752.  | -722.  | 369.   | -249.    | -5876.  | -8750.   | 0.0000  | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 0.0000  | 4231.  |  |  |
| .4000   | 5870.  | -951.  | 356.   | -407.    | -5854.  | -9456.   | -0.0000 | -0.0000 | 0.0000  | -0.0000 | 0.0000  | 0.0000  | 4466.  |  |  |

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S/RV PIPING KEWAUKEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS





|       |       |       |       |        |       |        |        |        |        |        |       |        |      |
|-------|-------|-------|-------|--------|-------|--------|--------|--------|--------|--------|-------|--------|------|
| .0180 | -278. | -185. | 258.  | 270.   | 156.  | 296.   | -.0151 | -.0021 | -.0018 | -.0139 | .0441 | .0054  | 238. |
| .0190 | -68.  | -122. | 251.  | 244.   | 59.   | 9.     | -.0127 | -.0021 | -.0013 | -.0109 | .0473 | -.0001 | 160. |
| .0200 | 173.  | 2.    | 100.  | 224.   | -11.  | -294.  | -.0084 | -.0019 | .0001  | -.0061 | .0499 | -.0067 | 101. |
| .0210 | 403.  | 149.  | 41.   | 171.   | -10.  | -571.  | -.0024 | -.0015 | .0030  | -.0003 | .0538 | -.0131 | 149. |
| .0220 | 562.  | 176.  | -143. | -105.  | 93.   | -832.  | .0050  | -.0010 | .0075  | .0060  | .0536 | -.0168 | 235. |
| .0230 | 676.  | 52.   | -306. | -458.  | 297.  | -1062. | .0125  | -.0006 | .0134  | .0100  | .0761 | -.0195 | 339. |
| .0240 | 826.  | 68.   | -649. | -811.  | 484.  | -1286. | .0191  | -.0005 | .0195  | .0094  | .0843 | -.0248 | 479. |
| .0250 | 1046. | 297.  | -880. | -1025. | 562.  | -1449. | .0242  | -.0004 | .0240  | .0065  | .0826 | -.0336 | 640. |
| .0260 | 1171. | 540.  | -994. | -1056. | 520.  | -1482. | .0284  | -.0001 | .0250  | .0089  | .0746 | -.0399 | 747. |
| .0270 | 1174. | 374.  | -898. | -991.  | 442.  | -1565. | .0320  | .0008  | .0230  | .0190  | .0702 | -.0388 | 762. |
| .0280 | 1288. | 186.  | -681. | -791.  | 156.  | -1807. | .0343  | .0021  | .0201  | .0266  | .0643 | -.0387 | 764. |
| .0290 | 1540. | 508.  | -484. | -366.  | -209. | -1982. | .0350  | .0036  | .0180  | .0264  | .0442 | -.0452 | 795. |
| .0300 | 1497. | 591.  | -186. | 115.   | -581. | -1836. | .0355  | .0048  | .0167  | .0304  | .0262 | -.0440 | 805. |
| .0310 | 1145. | 295.  | 225.  | 582.   | -838. | -1464. | .0359  | .0059  | .0167  | .0390  | .0164 | -.0322 | 774. |
| .0320 | 739.  | 220.  | 424.  | 875.   | -883. | -892.  | .0340  | .0069  | .0193  | .0402  | .0048 | -.0218 | 716. |

.0330 276. 284. 300. 703. -621. -183. .0287 .0079 .0236 .0313 -.0380 -.0167 408.

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
EVALUATION

3/RY FIRING SEQUENCE GENSET 2 POP DISK  
2 SAFETY COIL FWD/REV--D PSV



S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1      | SEQUENCE | 815     | LOCATION | BEG    | TYPE   | RU     |        |        |        |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |  |
| .0340   | -319.  | 162.   | 123.   | 474.     | -179.   | 635.     | .0205  | .0090  | .0268  | .0201  | -.0160 | -.0114 | 326.   |  |  |
| .0350   | -914.  | 120.   | 68.    | 325.     | 181.    | 1543.    | .0106  | .0101  | .0259  | .0114  | -.0267 | -.0056 | 637.   |  |  |
| .0360   | -1391. | 236.   | 79.    | 355.     | 355.    | 2347.    | -.0001 | .0111  | .0196  | .0071  | -.0464 | -.0005 | 963.   |  |  |
| .0370   | -1721. | 34.    | 214.   | 421.     | 346.    | 2696.    | -.0103 | .0122  | .0093  | .0088  | -.0638 | .0065  | 1104.  |  |  |
| .0380   | -1754. | -443.  | 598.   | 669.     | 61.     | 2455.    | -.0191 | .0134  | -.0020 | .0121  | -.0703 | .0129  | 1022.  |  |  |
| .0390   | -1409. | -481.  | 1083.  | 1243.    | -527.   | 1944.    | -.0261 | .0145  | -.0111 | .0085  | -.0759 | .0108  | 950.   |  |  |
| .0400   | -1011. | -19.   | 1418.  | 1883.    | -1167.  | 1615.    | -.0301 | .0148  | -.0167 | -.0017 | -.0891 | .0053  | 1100.  |  |  |
| .0410   | -890.  | -66.   | 1680.  | 2206.    | -1579.  | 1364.    | -.0297 | .0141  | -.0200 | -.0057 | -.0947 | .0123  | 1218.  |  |  |
| .0420   | -860.  | -485.  | 1727.  | 2048.    | -1625.  | 1030.    | -.0270 | .0127  | -.0211 | -.0070 | -.0935 | .0271  | 1128.  |  |  |
| .0430   | -735.  | -609.  | 1300.  | 1385.    | -1287.  | 706.     | -.0257 | .0115  | -.0201 | -.0103 | -.0968 | .0303  | 810.   |  |  |
| .0440   | -758.  | -501.  | 442.   | 230.     | -531.   | 715.     | -.0268 | .0103  | -.0179 | -.0172 | -.1025 | .0232  | 369.   |  |  |
| .0450   | -973.  | -466.  | -310.  | -868.    | 316.    | 1036.    | -.0287 | .0086  | -.0164 | -.0202 | -.1002 | .0174  | 557.   |  |  |
| .0460   | -1095. | -454.  | -703.  | -1496.   | 864.    | 1264.    | -.0303 | .0065  | -.0165 | -.0170 | -.0942 | .0143  | 859.   |  |  |
| .0470   | -968.  | -405.  | -943.  | -1812.   | 1031.   | 1075.    | -.0310 | .0040  | -.0173 | -.0139 | -.0955 | .0166  | 941.   |  |  |
| .0480   | -681.  | -482.  | -958.  | -1801.   | 837.    | 503.     | -.0301 | .0013  | -.0178 | -.0122 | -.0966 | .0069  | 822.   |  |  |
| .0490   | -325.  | -629.  | -475.  | -1150.   | 272.    | -142.    | -.0275 | -.0013 | -.0172 | -.0072 | -.0829 | .0122  | 478.   |  |  |
| .0500   | 3.     | -577.  | 223.   | -126.    | -422.   | -552.    | -.0247 | -.0035 | -.0150 | -.0007 | -.0585 | .0148  | 283.   |  |  |
| .0510   | 199.   | -452.  | 653.   | 594.     | -874.   | -760.    | -.0230 | -.0053 | -.0110 | .0046  | -.0338 | .0120  | 522.   |  |  |
| .0520   | 278.   | -454.  | 755.   | 827.     | -938.   | -911.    | -.0224 | -.0070 | -.0055 | .0101  | -.0100 | .0067  | 621.   |  |  |
| .0530   | 241.   | -470.  | 637.   | 735.     | -640.   | -873.    | -.0221 | -.0089 | .0008  | .0168  | .0137  | .0028  | 525.   |  |  |
| .0540   | -36.   | -420.  | 249.   | 280.     | 4.      | -420.    | -.0218 | -.0104 | .0076  | .0230  | .0349  | .0006  | 203.   |  |  |
| .0550   | -498.  | -349.  | -326.  | -433.    | 824.    | 316.     | -.0212 | -.0112 | .0147  | .0265  | .0526  | -.0010 | 398.   |  |  |
| .0560   | -815.  | -210.  | -773.  | -953.    | 1502.   | 894.     | -.0202 | -.0114 | .0211  | .0281  | .0691  | -.0036 | 799.   |  |  |
| .0570   | -789.  | -72.   | -943.  | -1084.   | 1783.   | 974.     | -.0187 | -.0110 | .0257  | .0317  | .0853  | -.0082 | 924.   |  |  |
| .0580   | -498.  | -76.   | -884.  | -943.    | 1657.   | 558.     | -.0164 | -.0097 | .0284  | .0384  | .1009  | -.0158 | 797.   |  |  |
| .0590   | -15.   | -36.   | -580.  | -448.    | 1143.   | -109.    | -.0129 | -.0074 | .0298  | .0452  | .1152  | -.0263 | 495.   |  |  |
| .0600   | 604.   | 249.   | -64.   | 427.     | 382.    | -790.    | -.0074 | -.0047 | .0310  | .0506  | .1283  | -.0366 | 392.   |  |  |
| .0610   | 1188.  | 558.   | 346.   | 1164.    | -274.   | -1402.   | .0004  | -.0020 | .0321  | .0556  | .1390  | -.0419 | 739.   |  |  |
| .0620   | 1608.  | 590.   | 380.   | 1261.    | -551.   | -1974.   | .0097  | .0010  | .0332  | .0610  | .1444  | -.0409 | 966.   |  |  |
| .0630   | 1870.  | 529.   | 64.    | 817.     | -434.   | -2381.   | .0185  | .0043  | .0341  | .0652  | .1420  | -.0376 | 1025.  |  |  |
| .0640   | 1931.  | 648.   | -499.  | 83.      | 37.     | -2363.   | .0250  | .0075  | .0347  | .0661  | .1329  | -.0359 | 949.   |  |  |
| .0650   | 1746.  | 865.   | -1246. | -893.    | 787.    | -1910.   | .0283  | .0105  | .0346  | .0632  | .1212  | -.0363 | 903.   |  |  |
| .0660   | 1505.  | 1026.  | -1956. | -1872.   | 1525.   | -1392.   | .0285  | .0136  | .0326  | .0579  | .1099  | -.0381 | 1119.  |  |  |
| .0670   | 1413.  | 1120.  | -2333. | -2419.   | 1909.   | -1138.   | .0269  | .0166  | .0278  | .0537  | .0990  | -.0393 | 1318.  |  |  |
| .0680   | 1418.  | 1053.  | -2234. | -2341.   | 1813.   | -1166.   | .0247  | .0190  | .0199  | .0545  | .0898  | -.0365 | 1277.  |  |  |
| .0690   | 1446.  | 816.   | -1681. | -1683.   | 1256.   | -1358.   | .0225  | .0202  | .0101  | .0599  | .0840  | -.0295 | 1003.  |  |  |
| .0700   | 1574.  | 702.   | -811.  | -544.    | 331.    | -1602.   | .0199  | .0204  | .0005  | .0638  | .0796  | -.0235 | 692.   |  |  |
| .0710   | 1713.  | 765.   | 99.    | 726.     | -639.   | -1756.   | .0165  | .0197  | -.0071 | .0634  | .0746  | -.0204 | 804.   |  |  |

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |       |       |        |        |       |        |       |        |        |       |       |        |       |
|-------|-------|-------|--------|--------|-------|--------|-------|--------|--------|-------|-------|--------|-------|
| .0610 | 1188. | 558.  | 346.   | 1164.  | -274. | -1402. | .0004 | -.0020 | .0321  | .0556 | .1390 | -.0419 | 739.  |
| .0620 | 1608. | 590.  | 380.   | 1261.  | -551. | -1974. | .0097 | .0010  | .0332  | .0610 | .1444 | -.0409 | 966.  |
| .0630 | 1870. | 529.  | 64.    | 817.   | -434. | -2381. | .0185 | .0043  | .0341  | .0652 | .1420 | -.0376 | 1025. |
| .0640 | 1931. | 648.  | -499.  | 87.    | 37.   | -2363. | .0250 | .0075  | .0347  | .0661 | .1329 | -.0359 | 949.  |
| .0650 | 1746. | 865.  | -1246. | -893.  | 787.  | -1910. | .0283 | .0105  | .0346  | .0632 | .1212 | -.0363 | 903.  |
| .0660 | 1505. | 1026. | -1956. | -1872. | 1525. | -1392. | .0285 | .0136  | .0326  | .0579 | .1099 | -.0381 | 1119. |
| .0670 | 1413. | 1120. | -2333. | -2419. | 1909. | -1138. | .0269 | .0166  | .0278  | .0537 | .0990 | -.0393 | 1318. |
| .0680 | 1418. | 1053. | -2234. | -2341. | 1813. | -1166. | .0247 | .0190  | .0199  | .0545 | .0898 | -.0365 | 1277. |
| .0690 | 1446. | 816.  | -1681. | -1683. | 1256. | -1358. | .0225 | .0202  | .0101  | .0599 | .0840 | -.0295 | 1003. |
| .0700 | 1574. | 702.  | -811.  | -544.  | 331.  | -1602. | .0199 | .0204  | .0005  | .0638 | .0796 | -.0235 | 692.  |
| .0710 | 1713. | 765.  | 99.    | 726.   | -639. | -1756. | .0165 | .0197  | -.0071 | .0634 | .0746 | -.0204 | 804.  |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKM24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1      | SEQUENCE | 815     | LOCATION | BEG    | TYPE   | RU     |        |        |        |        |  |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |
| .0720   | 1588.  | 640.   | 750.   | 1580.    | -1220.  | -1687.   | .0123  | .0177  | -.0125 | .0623  | .0711  | -.0168 | 1050.  |  |
| .0730   | 1160.  | 284.   | 1031.  | 1784.    | -1283.  | -1342.   | .0074  | .0149  | -.0159 | .0610  | .0665  | -.0122 | 1033.  |  |
| .0740   | 603.   | 84.    | 911.   | 1482.    | -928.   | -699.    | .0016  | .0115  | -.0179 | .0561  | .0529  | -.0113 | 756.   |  |
| .0750   | -54.   | 78.    | 490.   | 828.     | -290.   | 208.     | -.0047 | .0076  | -.0194 | .0483  | .0286  | -.0139 | 362.   |  |
| .0760   | -807.  | -30.   | -12.   | 17.      | 449.    | 1155.    | -.0100 | .0031  | -.0219 | .0426  | .0006  | -.0148 | 501.   |  |
| .0770   | -1417. | -246.  | -329.  | -583.    | 969.    | 1846.    | -.0138 | -.0015 | -.0258 | .0408  | -.0256 | -.0128 | 869.   |  |
| .0780   | -1697. | -404.  | -336.  | -716.    | 1041.   | 2090.    | -.0161 | -.0058 | -.0306 | .0409  | -.0479 | -.0108 | 980.   |  |
| .0790   | -1745. | -566.  | -22.   | -380.    | 687.    | 1987.    | -.0173 | -.0097 | -.0352 | .0420  | -.0622 | -.0097 | 857.   |  |
| .0800   | -1663. | -757.  | 585.   | 363.     | 27.     | 1684.    | -.0178 | -.0132 | -.0383 | .0429  | -.0652 | -.0091 | 691.   |  |
| .0810   | -1410. | -773.  | 1304.  | 1334.    | -783.   | 1281.    | -.0179 | -.0161 | -.0393 | .0407  | -.0609 | -.0103 | 806.   |  |
| .0820   | -1093. | -660.  | 1822.  | 2089.    | -1445.  | 884.     | -.0174 | -.0181 | -.0383 | .0359  | -.0552 | -.0121 | 1079.  |  |
| .0830   | -937.  | -709.  | 1971.  | 2268.    | -1683.  | 617.     | -.0160 | -.0192 | -.0364 | .0324  | -.0492 | -.0107 | 1160.  |  |
| .0840   | -963.  | -859.  | 1793.  | 1933.    | -1484.  | 567.     | -.0139 | -.0195 | -.0342 | .0311  | -.0452 | -.0062 | 1004.  |  |
| .0850   | -1022. | -799.  | 1339.  | 1290.    | -1014.  | 726.     | -.0115 | -.0188 | -.0317 | .0292  | -.0488 | -.0038 | 720.   |  |
| .0860   | -1052. | -577.  | 693.   | 449.     | -440.   | 956.     | -.0087 | -.0170 | -.0289 | .0274  | -.0593 | -.0053 | 459.   |  |
| .0870   | -1020. | -451.  | 100.   | -345.    | 36.     | 1034.    | -.0049 | -.0144 | -.0256 | .0284  | -.0693 | -.0076 | 438.   |  |
| .0880   | -818.  | -388.  | -211.  | -753.    | 200.    | 822.     | .0005  | -.0110 | -.0209 | .0313  | -.0749 | -.0092 | 455.   |  |
| .0890   | -428.  | -247.  | -247.  | -712.    | 0.      | 381.     | .0072  | -.0072 | -.0142 | .0328  | -.0769 | -.0106 | 324.   |  |
| .0900   | 5.     | -83.   | -113.  | -399.    | -429.   | -113.    | .0147  | -.0031 | -.0058 | .0317  | -.0753 | -.0102 | 239.   |  |
| .0910   | 355.   | 35.    | 127.   | 43.      | -898.   | -500.    | .0215  | .0011  | .0034  | .0287  | -.0694 | -.0064 | 413.   |  |
| .0920   | 565.   | 135.   | 325.   | 407.     | -1197.  | -685.    | .0259  | .0052  | .0117  | .0240  | -.0617 | -.0011 | 577.   |  |
| .0930   | 587.   | 205.   | 265.   | 388.     | -1131.  | -618.    | .0262  | .0093  | .0177  | .0177  | -.0549 | .0025  | 540.   |  |
| .0940   | 428.   | 248.   | -69.   | -53.     | -695.   | -293.    | .0220  | .0134  | .0203  | .0110  | -.0486 | .0032  | 303.   |  |
| .0950   | 172.   | 343.   | -475.  | -608.    | -84.    | 234.     | .0145  | .0175  | .0195  | .0041  | -.0416 | .0021  | 264.   |  |
| .0960   | -100.  | 479.   | -784.  | -1025.   | 476.    | 815.     | .0057  | .0213  | .0159  | -.0030 | -.0338 | .0017  | 559.   |  |
| .0970   | -302.  | 538.   | -922.  | -1218.   | 812.    | 1222.    | -.0022 | .0249  | .0105  | -.0104 | -.0252 | .0044  | 765.   |  |
| .0980   | -312.  | 527.   | -816.  | -1081.   | 797.    | 1287.    | -.0080 | .0286  | .0044  | -.0189 | -.0143 | .0103  | 747.   |  |
| .0990   | -104.  | 541.   | -467.  | -584.    | 449.    | 1046.    | -.0115 | .0324  | -.0018 | -.0294 | -.0009 | .0177  | 514.   |  |
| .1000   | 200.   | 590.   | -44.   | 35.      | -26.    | 675.     | -.0135 | .0365  | -.0080 | -.0415 | .0136  | .0240  | 272.   |  |
| .1010   | 513.   | 648.   | 256.   | 477.     | -409.   | 290.     | -.0149 | .0408  | -.0150 | -.0536 | .0261  | .0267  | 278.   |  |
| .1020   | 838.   | 723.   | 339.   | 597.     | -590.   | -100.    | -.0161 | .0454  | -.0236 | -.0633 | .0332  | .0247  | 339.   |  |
| .1030   | 1130.  | 786.   | 174.   | 351.     | -519.   | -465.    | -.0167 | .0495  | -.0337 | -.0687 | .0321  | .0191  | 313.   |  |
| .1040   | 1306.  | 794.   | -200.  | -204.    | -227.   | -736.    | -.0158 | .0524  | -.0444 | -.0686 | .0230  | .0122  | 320.   |  |
| .1050   | 1397.  | 795.   | -621.  | -817.    | 115.    | -912.    | -.0126 | .0538  | -.0537 | -.0642 | .0091  | .0058  | 494.   |  |
| .1060   | 1488.  | 827.   | -915.  | -1225.   | 317.    | -1082.   | -.0069 | .0536  | -.0593 | -.0579 | -.0050 | .0000  | 668.   |  |
| .1070   | 1570.  | 791.   | -1032. | -1384.   | 341.    | -1316.   | .0008  | .0517  | -.0597 | -.0519 | -.0150 | -.0052 | 778.   |  |
| .1080   | 1609.  | 747.   | -1010. | -1303.   | 227.    | -1542.   | .0092  | .0482  | -.0551 | -.0475 | -.0204 | -.0106 | 815.   |  |
| .1090   | 1568.  | 787.   | -861.  | -979.    | 34.     | -1611.   | .0170  | .0435  | -.0468 | -.0435 | -.0210 | -.0156 | 757.   |  |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKM24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |      |        |        |       |        |        |       |        |        |        |        |      |
|-------|-------|------|--------|--------|-------|--------|--------|-------|--------|--------|--------|--------|------|
| .0990 | -104. | 541. | -467.  | -584.  | 449.  | 1046.  | -.115  | .0324 | -.0018 | -.0294 | -.0009 | .0177  | 514. |
| .1000 | 200.  | 590. | -44.   | 35.    | -26.  | 675.   | -.135  | .0365 | -.0080 | -.0415 | .0136  | .0240  | 272. |
| .1010 | 513.  | 648. | 256.   | 477.   | -409. | 290.   | -.0149 | .0408 | -.0150 | -.0536 | .0261  | .0267  | 278. |
| .1020 | 838.  | 723. | 339.   | 597.   | -590. | -100.  | -.0161 | .0454 | -.0236 | -.0633 | .0332  | .0247  | 339. |
| .1030 | 1130. | 786. | 174.   | 351.   | -519. | -465.  | -.0167 | .0495 | -.0337 | -.0687 | .0321  | .0191  | 313. |
| .1040 | 1306. | 794. | -200.  | -204.  | -227. | -736.  | -.0158 | .0524 | -.0444 | -.0686 | .0230  | .0122  | 320. |
| .1050 | 1397. | 795. | -621.  | -817.  | 115.  | -912.  | -.0126 | .0538 | -.0537 | -.0642 | .0091  | .0058  | 494. |
| .1060 | 1488. | 827. | -915.  | -1225. | 317.  | -1082. | -.0069 | .0526 | -.0593 | -.0579 | -.0050 | .0000  | 668. |
| .1070 | 1570. | 791. | -1032. | -1384. | 341.  | -1316. | .0008  | .0517 | -.0597 | -.0519 | -.0150 | -.0052 | 778. |
| .1080 | 1609. | 747. | -1010. | -1303. | 227.  | -1542. | .0092  | .0487 | -.0551 | -.0475 | -.0204 | -.0106 | 815. |
| .1090 | 1568. | 787. | -861.  | -979.  | 34.   | -1611. | .0170  | .0435 | -.0468 | -.0435 | -.0210 | -.0156 | 757. |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKM24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1      | SEQUENCE | 815     | LOCATION | BEG    | TYPE   | RU     | DX     | DY     | DZ     | RX    | RY | RZ | STRESS |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|-------|----|----|--------|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI) |    |    |        |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  |        |        |        |        |        |        |       |    |    |        |
| .1100   | 1339.  | 359.   | -545.  | -675.    | -104.   | -1669.   | .0228  | .0387  | -.0372 | -.0370 | -.0081 | -.0175 | 724.  |    |    |        |
| .1110   | 964.   | -31.   | -338.  | -514.    | -55.    | -1505.   | .0253  | .0330  | -.0283 | -.0328 | .0055  | -.0211 | 639.  |    |    |        |
| .1120   | 533.   | 3.     | -317.  | -426.    | 161.    | -999.    | .0247  | .0256  | -.0217 | -.0314 | .0112  | -.0269 | 441.  |    |    |        |
| .1130   | 74.    | 31.    | -222.  | -286.    | 373.    | -395.    | .0222  | .0180  | -.0191 | -.0253 | .0160  | -.0293 | 246.  |    |    |        |
| .1140   | -410.  | -291.  | 48.    | -90.     | 476.    | 56.      | .0189  | .0121  | -.0193 | -.0127 | .0235  | -.0276 | 196.  |    |    |        |
| .1150   | -839.  | -699.  | 367.   | 169.     | 461.    | 333.     | .0160  | .0082  | -.0193 | -.0008 | .0303  | -.0261 | 238.  |    |    |        |
| .1160   | -1070. | -888.  | 737.   | 622.     | 274.    | 465.     | .0147  | .0056  | -.0161 | .0048  | .0387  | -.0242 | 330.  |    |    |        |
| .1170   | -1050. | -861.  | 1209.  | 1299.    | -135.   | 442.     | .0158  | .0046  | -.0085 | .0047  | .0505  | -.0206 | 553.  |    |    |        |
| .1180   | -991.  | -1138. | 1675.  | 1815.    | -586.   | 208.     | .0193  | .0061  | .0024  | .0020  | .0547  | -.0139 | 770.  |    |    |        |
| .1190   | -915.  | -1220. | 1828.  | 2024.    | -888.   | 13.      | .0241  | .0090  | .0150  | -.0076 | .0532  | -.0098 | 887.  |    |    |        |
| .1200   | -814.  | -924.  | 1623.  | 1906.    | -925.   | 23.      | .0297  | .0121  | .0265  | -.0210 | .0453  | -.0051 | 850.  |    |    |        |
| .1210   | -802.  | -820.  | 1189.  | 1305.    | -637.   | 147.     | .0355  | .0163  | .0341  | -.0286 | .0261  | .0070  | 586.  |    |    |        |
| .1220   | -819.  | -791.  | 510.   | 287.     | -102.   | 309.     | .0395  | .0229  | .0373  | -.0331 | .0037  | .0178  | 174.  |    |    |        |
| .1230   | -845.  | -839.  | -272.  | -903.    | 546.    | 403.     | .0411  | .0312  | .0375  | -.0387 | -.0187 | .0239  | 453.  |    |    |        |
| .1240   | -689.  | -636.  | -880.  | -1730.   | 983.    | 393.     | .0412  | .0393  | .0365  | -.0481 | -.0378 | .0266  | 814.  |    |    |        |
| .1250   | -274.  | -282.  | -1098. | -1954.   | 951.    | 168.     | .0413  | .0468  | .0357  | -.0587 | -.0477 | .0310  | 875.  |    |    |        |
| .1260   | 214.   | -254.  | -911.  | -1751.   | 488.    | -354.    | .0423  | .0540  | .0356  | -.0691 | -.0466 | .0402  | 743.  |    |    |        |
| .1270   | 704.   | -139.  | -516.  | -1146.   | -234.   | -920.    | .0438  | .0600  | .0368  | -.0846 | -.0480 | .0492  | 597.  |    |    |        |
| .1280   | 1032.  | -37.   | -42.   | -413.    | -903.   | -1297.   | .0453  | .0636  | .0381  | -.1007 | -.0476 | .0625  | 656.  |    |    |        |
| .1290   | 1169.  | 51.    | 285.   | 71.      | -1283.  | -1351.   | .0451  | .0651  | .0379  | -.1125 | -.0446 | .0784  | 748.  |    |    |        |
| .1300   | 1061.  | 65.    | 274.   | 17.      | -1227.  | -1080.   | .0409  | .0655  | .0353  | -.1203 | -.0454 | .0892  | 656.  |    |    |        |
| .1310   | 613.   | -161.  | -25.   | -546.    | -701.   | -534.    | .0324  | .0643  | .0311  | -.1264 | -.0517 | .0923  | 416.  |    |    |        |
| .1320   | 31.    | -116.  | -474.  | -1174.   | 46.     | 314.     | .0207  | .0606  | .0262  | -.1347 | -.0669 | .0869  | 488.  |    |    |        |
| .1330   | -554.  | -18.   | -844.  | -1682.   | 722.    | 1226.    | .0090  | .0547  | .0216  | -.1415 | -.0800 | .0810  | 884.  |    |    |        |
| .1340   | -1046. | -66.   | -959.  | -1896.   | 1078.   | 1915.    | -.0005 | .0475  | .0179  | -.1459 | -.0371 | .0775  | 1165. |    |    |        |
| .1350   | -1429. | -277.  | -713.  | -1624.   | 1037.   | 2257.    | -.0067 | .0391  | .0154  | -.1493 | -.0896 | .0757  | 1191. |    |    |        |
| .1360   | -1673. | -605.  | -141.  | -905.    | 669.    | 2263.    | -.0097 | .0288  | .0136  | -.1503 | -.0851 | .0759  | 1014. |    |    |        |
| .1370   | -1596. | -598.  | 502.   | 57.      | 51.     | 2042.    | -.0111 | .0176  | .0116  | -.1507 | -.0802 | .0709  | 820.  |    |    |        |
| .1380   | -1361. | -569.  | 1020.  | 811.     | -554.   | 1656.    | -.0120 | .0071  | .0085  | -.1489 | -.0749 | .0594  | 773.  |    |    |        |
| .1390   | -1203. | -560.  | 1271.  | 1179.    | -862.   | 1334.    | -.0125 | -.0021 | .0038  | -.1461 | -.0749 | .0426  | 794.  |    |    |        |
| .1400   | -1193. | -492.  | 1187.  | 1121.    | -749.   | 1229.    | -.0117 | -.0105 | -.0024 | -.1415 | -.0311 | .0262  | 732.  |    |    |        |
| .1410   | -1222. | -532.  | 813.   | 577.     | -326.   | 1181.    | -.0081 | -.0177 | -.0096 | -.1328 | -.0873 | .0163  | 544.  |    |    |        |
| .1420   | -1092. | -419.  | 247.   | -182.    | 134.    | 1057.    | -.0033 | -.0227 | -.0161 | -.1245 | -.0984 | .0078  | 434.  |    |    |        |
| .1430   | -926.  | -320.  | -268.  | -842.    | 501.    | 844.     | .0053  | -.0256 | -.0205 | -.1177 | -.1104 | -.0002 | 519.  |    |    |        |
| .1440   | -739.  | -151.  | -549.  | -1091.   | 658.    | 618.     | .0142  | -.0269 | -.0220 | -.1116 | -.1180 | -.0070 | 568.  |    |    |        |
| .1450   | -398.  | 104.   | -548.  | -906.    | 494.    | 292.     | .0235  | -.0263 | -.0208 | -.1041 | -.1157 | -.0118 | 430.  |    |    |        |
| .1460   | 69.    | 214.   | -321.  | -488.    | 64.     | -226.    | .0322  | -.0229 | -.0173 | -.0949 | -.1029 | -.0148 | 217.  |    |    |        |
| .1470   | 511.   | 403.   | -4.    | 133.     | -464.   | -695.    | .0391  | -.0173 | -.0119 | -.0872 | -.0921 | -.0193 | 340.  |    |    |        |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKM24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |       |       |        |       |       |       |        |        |       |       |        |       |
|-------|--------|-------|-------|--------|-------|-------|-------|--------|--------|-------|-------|--------|-------|
| .1370 | -1596. | -598. | 502.  | 57.    | 51.   | 2042. | -0111 | .0176  | .0116  | -1507 | -0802 | .0709  | 1014. |
| .1380 | -1361. | -569. | 1020. | 811.   | -554. | 1656. | -0120 | .0071  | .0085  | -1489 | -0749 | .0594  | 773.  |
| .1390 | -1203. | -560. | 1271. | 1179.  | -862. | 1334. | -0125 | -.0021 | .0038  | -1461 | -0749 | .0426  | 794.  |
| .1400 | -1193. | -492. | 1187. | 1121.  | -749. | 1229. | -0117 | -.0105 | -.0024 | -1415 | -0811 | .0262  | 732.  |
| .1410 | -1222. | -532. | 813.  | 577.   | -326. | 1181. | -0081 | -.0177 | -.0096 | -1328 | -0873 | .0163  | 544.  |
| .1420 | -1092. | -419. | 247.  | -182.  | 134.  | 1057. | -0023 | -.0227 | -.0161 | -1245 | -0984 | .0078  | 434.  |
| .1430 | -926.  | -320. | -268. | -842.  | 501.  | 844.  | .0053 | -.0256 | -.0205 | -1177 | -1104 | -.0002 | 519.  |
| .1440 | -739.  | -151. | -549. | -1091. | 658.  | 618.  | .0142 | -.0269 | -.0220 | -1116 | -1180 | -.0070 | 568.  |
| .1450 | -398.  | 104.  | -548. | -906.  | 494.  | 292.  | .0235 | -.0263 | -.0208 | -1041 | -1157 | -.0118 | 430.  |
| .1460 | 69.    | 214.  | -321. | -488.  | 64.   | -226. | .0322 | -.0229 | -.0173 | -0949 | -1029 | -.0148 | 217.  |
| .1470 | 511.   | 403.  | -4.   | 133.   | -464. | -695. | .0391 | -.0173 | -.0119 | -0872 | -0921 | -.0193 | 340.  |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1      | SEQUENCE | 815     | LOCATION | BEG    | TYPE   | RU     | DX     | DY     | DZ     | RX    | RY    | RZ    | STRESS |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (DEG) | (DEG) | (DEG) | (PSI)  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  |        |        |        |        |        |        |       |       |       |        |
| .1480   | 707.   | 486.   | 349.   | 785.     | -874.   | -907.    | .0443  | -.0104 | -.0059 | -.0784 | -.0828 | -.0200 |       |       |       | 595.   |
| .1490   | 746.   | 601.   | 596.   | 1277.    | -1107.  | -811.    | .0474  | -.0023 | .0004  | -.0678 | -.0761 | -.0163 |       |       |       | 752.   |
| .1500   | 685.   | 776.   | 601.   | 1421.    | -1102.  | -477.    | .0479  | .0072  | .0070  | -.0576 | -.0732 | -.0112 |       |       |       | 747.   |
| .1510   | 360.   | 679.   | 411.   | 1172.    | -755.   | 34.      | .0454  | .0173  | .0143  | -.0481 | -.0589 | -.0048 |       |       |       | 560.   |
| .1520   | -135.  | 584.   | 145.   | 836.     | -204.   | 728.     | .0403  | .0271  | .0227  | -.0418 | -.0529 | .0003  |       |       |       | 452.   |
| .1530   | -590.  | 536.   | -60.   | 568.     | 296.    | 1423.    | .0336  | .0362  | .0316  | -.0373 | -.0505 | .0049  |       |       |       | 626.   |
| .1540   | -842.  | 644.   | -158.  | 484.     | 543.    | 1952.    | .0262  | .0445  | .0400  | -.0344 | -.0349 | .0082  |       |       |       | 836.   |
| .1550   | -994.  | 649.   | -69.   | 629.     | 554.    | 2210.    | .0194  | .0516  | .0466  | -.0303 | -.0169 | .0136  |       |       |       | 948.   |
| .1560   | -1138. | 259.   | 248.   | 922.     | 426.    | 2132.    | .0136  | .0567  | .0505  | -.0224 | .0078  | .0254  |       |       |       | 948.   |
| .1570   | -1070. | 24.    | 586.   | 1293.    | 165.    | 1831.    | .0079  | .0599  | .0516  | -.0150 | .0307  | .0368  |       |       |       | 902.   |
| .1580   | -877.  | -138.  | 802.   | 1472.    | -85.    | 1422.    | .0014  | .0614  | .0500  | -.0078 | .0522  | .0450  |       |       |       | 822.   |
| .1590   | -778.  | -437.  | 890.   | 1377.    | -151.   | 1040.    | -.0063 | .0607  | .0464  | -.0001 | .0727  | .0501  |       |       |       | 695.   |
| .1600   | -728.  | -622.  | 818.   | 1114.    | -18.    | 735.     | -.0148 | .0574  | .0416  | .0056  | .0364  | .0499  |       |       |       | 536.   |
| .1610   | -609.  | -675.  | 535.   | 610.     | 246.    | 401.     | -.0228 | .0519  | .0366  | .0099  | .0934  | .0463  |       |       |       | 309.   |
| .1620   | -461.  | -928.  | 130.   | -179.    | 570.    | -71.     | -.0286 | .0447  | .0318  | .0162  | .0998  | .0453  |       |       |       | 242.   |
| .1630   | -277.  | -1110. | -258.  | -887.    | 828.    | -572.    | -.0318 | .0363  | .0278  | .0217  | .1009  | .0445  |       |       |       | 539.   |
| .1640   | -132.  | -1273. | -527.  | -1379.   | 994.    | -1054.   | -.0324 | .0268  | .0246  | .0266  | .0980  | .0443  |       |       |       | 803.   |
| .1650   | 27.    | -1481. | -717.  | -1767.   | 1056.   | -1574.   | -.0315 | .0167  | .0218  | .0316  | .0946  | .0442  |       |       |       | 1040.  |
| .1660   | 347.   | -1448. | -891.  | -2024.   | 973.    | -2123.   | -.0303 | .0068  | .0188  | .0353  | .0877  | .0397  |       |       |       | 1240.  |
| .1670   | 660.   | -1425. | -986.  | -2172.   | 855.    | -2639.   | -.0299 | -.0024 | .0150  | .0392  | .0815  | .0326  |       |       |       | 1414.  |
| .1680   | 836.   | -1389. | -1025. | -2203.   | 793.    | -2955.   | -.0305 | -.0106 | .0102  | .0429  | .0747  | .0236  |       |       |       | 1513.  |
| .1690   | 893.   | -1375. | -1040. | -2206.   | 789.    | -3067.   | -.0318 | -.0172 | .0045  | .0474  | .0695  | .0151  |       |       |       | 1549.  |
| .1700   | 967.   | -1233. | -1037. | -2132.   | 752.    | -3039.   | -.0337 | -.0217 | -.0014 | .0514  | .0647  | .0067  |       |       |       | 1520.  |
| .1710   | 1029.  | -904.  | -985.  | -1871.   | 664.    | -2854.   | -.0360 | -.0240 | -.0065 | .0538  | .0574  | -.0026 |       |       |       | 1395.  |
| .1720   | 869.   | -873.  | -807.  | -1528.   | 611.    | -2540.   | -.0379 | -.0243 | -.0100 | .0574  | .0557  | -.0079 |       |       |       | 1214.  |
| .1730   | 677.   | -719.  | -558.  | -1008.   | 501.    | -2072.   | -.0396 | -.0225 | -.0112 | .0593  | .0553  | -.0132 |       |       |       | 946.   |
| .1740   | 577.   | -352.  | -284.  | -368.    | 300.    | -1525.   | -.0413 | -.0186 | -.0100 | .0589  | .0563  | -.0196 |       |       |       | 641.   |
| .1750   | 449.   | -66.   | -9.    | 238.     | 110.    | -965.    | -.0427 | -.0128 | -.0071 | .0582  | .0589  | -.0253 |       |       |       | 401.   |
| .1760   | 268.   | 223.   | 220.   | 808.     | -26.    | -362.    | -.0437 | -.0056 | -.0033 | .0569  | .0566  | -.0313 |       |       |       | 356.   |
| .1770   | 67.    | 445.   | 407.   | 1275.    | -118.   | 235.     | -.0438 | .0025  | .0004  | .0571  | .0509  | -.0345 |       |       |       | 522.   |
| .1780   | -39.   | 805.   | 503.   | 1644.    | -222.   | 821.     | -.0428 | .0112  | .0033  | .0587  | .0390  | -.0360 |       |       |       | 743.   |
| .1790   | -147.  | 1050.  | 532.   | 1841.    | -285.   | 1336.    | -.0409 | .0201  | .0055  | .0622  | .0244  | -.0346 |       |       |       | 920.   |
| .1800   | -270.  | 1158.  | 527.   | 1925.    | -302.   | 1733.    | -.0385 | .0285  | .0075  | .0659  | .0081  | -.0319 |       |       |       | 1046.  |
| .1810   | -260.  | 1446.  | 471.   | 2010.    | -359.   | 2012.    | -.0359 | .0362  | .0098  | .0669  | -.0114 | -.0313 |       |       |       | 1150.  |
| .1820   | -178.  | 1594.  | 407.   | 1978.    | -446.   | 2114.    | -.0329 | .0426  | .0123  | .0685  | -.0257 | -.0281 |       |       |       | 1175.  |
| .1830   | -68.   | 1656.  | 346.   | 1888.    | -551.   | 2097.    | -.0298 | .0476  | .0148  | .0698  | -.0362 | -.0232 |       |       |       | 1154.  |
| .1840   | 21.    | 1657.  | 298.   | 1786.    | -637.   | 2004.    | -.0271 | .0506  | .0167  | .0696  | -.0452 | -.0175 |       |       |       | 1107.  |
| .1850   | 103.   | 1599.  | 226.   | 1609.    | -680.   | 1838.    | -.0252 | .0515  | .0175  | .0685  | -.0525 | -.0111 |       |       |       | 1017.  |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |       |      |       |       |       |        |        |        |       |        |        |       |
|-------|-------|-------|------|-------|-------|-------|--------|--------|--------|-------|--------|--------|-------|
| .1750 | 445.  | -66.  | -9.  | 236.  | 110.  | -965. | -.0427 | -.0128 | -.0071 | .0582 | .0589  | -.0253 | 401.  |
| .1760 | 288.  | 223.  | 220. | 808.  | -26.  | -362. | -.0437 | -.0056 | -.0033 | .0569 | .0566  | -.0313 | 356.  |
| .1770 | 67.   | 445.  | 407. | 1275. | -118. | 235.  | -.0438 | .0025  | .0004  | .0571 | .0509  | -.0345 | 522.  |
| .1780 | -39.  | 805.  | 503. | 1644. | -222. | 821.  | -.0428 | .0112  | .0033  | .0587 | .0390  | -.0360 | 743.  |
| .1790 | -147. | 1050. | 532. | 1841. | -285. | 1336. | -.0409 | .0201  | .0055  | .0622 | .0244  | -.0346 | 920.  |
| .1800 | -270. | 1158. | 527. | 1925. | -302. | 1733. | -.0385 | .0285  | .0075  | .0659 | .0081  | -.0319 | 1046. |
| .1810 | -260. | 1446. | 471. | 2010. | -359. | 2012. | -.0359 | .0362  | .0098  | .0669 | -.0114 | -.0313 | 1150. |
| .1820 | -178. | 1594. | 407. | 1978. | -446. | 2114. | -.0329 | .0426  | .0123  | .0685 | -.0257 | -.0281 | 1175. |
| .1830 | -68.  | 1656. | 346. | 1888. | -551. | 2097. | -.0298 | .0476  | .0148  | .0698 | -.0362 | -.0232 | 1154. |
| .1840 | 21.   | 1657. | 298. | 1726. | -637. | 2004. | -.0271 | .0506  | .0167  | .0696 | -.0452 | -.0175 | 1107. |
| .1850 | 103.  | 1599. | 226. | 1609. | -680. | 1838. | -.0252 | .0515  | .0175  | .0685 | -.0525 | -.0111 | 1017. |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1      | SEQUENCE | 815     | LOCATION | BEG    | TYPE   | RU     |       |        |        |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|-------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX     | DY     | DZ     | RX    | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG) | (DEG)  | (DEG)  | (PSI)  |  |  |
| .1860   | 227.   | 1574.  | 91.    | 1326.    | -690.   | 1620.    | -.0247 | .0506  | .0161  | .0674 | -.0587 | -.0054 | 885.   |  |  |
| .1870   | 309.   | 1374.  | -42.   | 933.     | -641.   | 1346.    | -.0256 | .0479  | .0124  | .0686 | -.0603 | .0009  | 706.   |  |  |
| .1880   | 358.   | 1178.  | -150.  | 579.     | -564.   | 1066.    | -.0284 | .0436  | .0067  | .0703 | -.0612 | .0045  | 537.   |  |  |
| .1890   | 386.   | 940.   | -216.  | 270.     | -491.   | 749.     | -.0324 | .0378  | -.0001 | .0725 | -.0501 | .0055  | 375.   |  |  |
| .1900   | 439.   | 641.   | -219.  | 15.      | -484.   | 361.     | -.0370 | .0309  | -.0069 | .0757 | -.0549 | .0050  | 242.   |  |  |
| .1910   | 532.   | 458.   | -146.  | -64.     | -578.   | -24.     | -.0415 | .0231  | -.0127 | .0782 | -.0488 | .0025  | 234.   |  |  |
| .1920   | 523.   | 195.   | 15.    | -20.     | -686.   | -342.    | -.0451 | .0147  | -.0167 | .0813 | -.0400 | .0012  | 308.   |  |  |
| .1930   | 400.   | -128.  | 189.   | 53.      | -744.   | -553.    | -.0481 | .0061  | -.0189 | .0847 | -.0295 | .0010  | 373.   |  |  |
| .1940   | 248.   | -386.  | 296.   | 77.      | -732.   | -654.    | -.0510 | -.0022 | -.0193 | .0876 | -.0187 | .0002  | 395.   |  |  |
| .1950   | 51.    | -586.  | 315.   | 11.      | -603.   | -625.    | -.0545 | -.0096 | -.0185 | .0900 | -.0078 | -.0027 | 349.   |  |  |
| .1960   | -255.  | -786.  | 261.   | -135.    | -326.   | -431.    | -.0589 | -.0160 | -.0171 | .0922 | .0035  | -.0078 | 224.   |  |  |
| .1970   | -610.  | -937.  | 172.   | -295.    | 30.     | -119.    | -.0638 | -.0211 | -.0157 | .0943 | .0152  | -.0147 | 128.   |  |  |
| .1980   | -878.  | -994.  | 102.   | -308.    | 334.    | 178.     | -.0684 | -.0246 | -.0145 | .0963 | .0285  | -.0219 | 217.   |  |  |
| .1990   | -1009. | -1013. | 109.   | -355.    | 500.    | 341.     | -.0714 | -.0265 | -.0134 | .0981 | .0437  | -.0280 | 282.   |  |  |
| .2000   | -1014. | -1025. | 226.   | -145.    | 499.    | 331.     | -.0723 | -.0269 | -.0121 | .0991 | .0599  | -.0324 | 247.   |  |  |
| .2010   | -876.  | -972.  | 431.   | 234.     | 331.    | 161.     | -.0708 | -.0258 | -.0103 | .0987 | .0758  | -.0358 | 175.   |  |  |
| .2020   | -587.  | -837.  | 648.   | 656.     | 58.     | -137.    | -.0671 | -.0231 | -.0081 | .0971 | .0915  | -.0385 | 270.   |  |  |
| .2030   | -209.  | -663.  | 772.   | 952.     | -190.   | -507.    | -.0617 | -.0190 | -.0053 | .0944 | .1062  | -.0409 | 439.   |  |  |
| .2040   | 177.   | -464.  | 725.   | 1014.    | -291.   | -872.    | -.0553 | -.0138 | -.0023 | .0898 | .1173  | -.0442 | 549.   |  |  |
| .2050   | 534.   | -234.  | 486.   | 812.     | -208.   | -1177.   | -.0484 | -.0077 | .0008  | .0837 | .1231  | -.0481 | 580.   |  |  |
| .2060   | 860.   | 14.    | 90.    | 373.     | 16.     | -1404.   | -.0412 | -.0012 | .0034  | .0777 | .1240  | -.0513 | 583.   |  |  |
| .2070   | 1157.  | 265.   | -382.  | -188.    | 301.    | -1567.   | -.0340 | .0054  | .0054  | .0726 | .1208  | -.0530 | 645.   |  |  |
| .2080   | 1421.  | 503.   | -823.  | -711.    | 560.    | -1703.   | -.0270 | .0118  | .0071  | .0679 | .1145  | -.0537 | 774.   |  |  |
| .2090   | 1662.  | 701.   | -1138. | -1070.   | 711.    | -1850.   | -.0207 | .0177  | .0088  | .0633 | .1078  | -.0537 | 904.   |  |  |
| .2100   | 1896.  | 852.   | -1276. | -1204.   | 696.    | -2011.   | -.0153 | .0232  | .0106  | .0595 | .1038  | -.0525 | 981.   |  |  |
| .2110   | 2107.  | 984.   | -1229. | -1093.   | 518.    | -2141.   | -.0111 | .0279  | .0127  | .0567 | .1025  | -.0503 | 987.   |  |  |
| .2120   | 2233.  | 1082.  | -1040. | -789.    | 251.    | -2184.   | -.0084 | .0317  | .0148  | .0546 | .1024  | -.0471 | 937.   |  |  |
| .2130   | 2223.  | 1104.  | -791.  | -425.    | 1.      | -2101.   | -.0073 | .0343  | .0167  | .0534 | .1020  | -.0426 | 860.   |  |  |
| .2140   | 2074.  | 1071.  | -574.  | -134.    | -150.   | -1855.   | -.0075 | .0358  | .0182  | .0529 | .1003  | -.0366 | 749.   |  |  |
| .2150   | 1787.  | 1030.  | -441.  | 26.      | -157.   | -1409.   | -.0092 | .0361  | .0191  | .0529 | .0965  | -.0295 | 569.   |  |  |
| .2160   | 1352.  | 969.   | -386.  | 63.      | -15.    | -774.    | -.0120 | .0353  | .0193  | .0530 | .0903  | -.0220 | 312.   |  |  |
| .2170   | 818.   | 863.   | -372.  | 22.      | 220.    | -46.     | -.0155 | .0335  | .0190  | .0530 | .0825  | -.0151 | 91.    |  |  |
| .2180   | 306.   | 747.   | -355.  | -22.     | 437.    | 633.     | -.0191 | .0309  | .0182  | .0525 | .0740  | -.0098 | 309.   |  |  |
| .2190   | -95.   | 652.   | -284.  | 14.      | 536.    | 1157.    | -.0223 | .0278  | .0172  | .0508 | .0654  | -.0061 | 512.   |  |  |
| .2200   | -378.  | 556.   | -121.  | 180.     | 485.    | 1492.    | -.0241 | .0242  | .0159  | .0479 | .0573  | -.0035 | 634.   |  |  |
| .2210   | -557.  | 449.   | 126.   | 462.     | 298.    | 1644.    | -.0242 | .0202  | .0142  | .0439 | .0493  | -.0013 | 696.   |  |  |
| .2220   | -620.  | 360.   | 391.   | 774.     | 25.     | 1629.    | -.0227 | .0160  | .0119  | .0389 | .0407  | .0002  | 724.   |  |  |
| .2230   | -578.  | 298.   | 509.   | 993.     | -247.   | 1480.    | -.0200 | .0120  | .0088  | .0327 | .0303  | .0004  | 722.   |  |  |

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ADLPIPE STRESS ANALYSIS

83/12/02.

18.29.02.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |       |       |       |       |       |        |        |       |       |       |       |        |      |
|-------|-------|-------|-------|-------|-------|--------|--------|-------|-------|-------|-------|--------|------|
| .2130 | 222.  | 1104. | 91.   | -42.  | 1.    | -2101. | -.0073 | .0343 | .0167 | .0534 | .1020 | -.0426 | 860. |
| .2140 | 2074. | 1071. | -574. | -124. | -150. | -1855. | -.0075 | .0358 | .0182 | .0529 | .1003 | -.0366 | 749. |
| .2150 | 1787. | 1030. | -441. | 28.   | -157. | -1409. | -.0092 | .0361 | .0191 | .0529 | .0965 | -.0295 | 569. |
| .2160 | 1351. | 989.  | -386. | 63.   | -15.  | -774.  | -.0120 | .0353 | .0193 | .0530 | .0903 | -.0220 | 312. |
| .2170 | 81.   | 863.  | -372. | 22.   | 220.  | -46.   | -.0155 | .0335 | .0190 | .0530 | .0825 | -.0151 | 91.  |
| .2180 | 306.  | 747.  | -355. | -22.  | 437.  | 633.   | -.0191 | .0309 | .0182 | .0525 | .0740 | -.0098 | 309. |
| .2190 | -95.  | 652.  | -284. | 14.   | 536.  | 1157.  | -.0223 | .0278 | .0172 | .0508 | .0654 | -.0061 | 512. |
| .2200 | -378. | 556.  | -121. | 180.  | 485.  | 1492.  | -.0241 | .0242 | .0159 | .0479 | .0573 | -.0035 | 634. |
| .2210 | -557. | 449.  | 126.  | 462.  | 298.  | 1644.  | -.0242 | .0202 | .0142 | .0439 | .0493 | -.0013 | 696. |
| .2220 | -620. | 360.  | 391.  | 774.  | 25.   | 1629.  | -.0227 | .0160 | .0119 | .0389 | .0407 | .0002  | 724. |
| .2230 | -578. | 298.  | 589.  | 993.  | -247. | 1480.  | -.0200 | .0120 | .0088 | .0327 | .0303 | .0004  | 722. |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
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CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1      | SEQUENCE | 815     | LOCATION | BEG | TYPE | RU     |        |        |        |        |        |        |
|---------|--------|--------|--------|----------|---------|----------|-----|------|--------|--------|--------|--------|--------|--------|--------|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       |     |      |        |        |        |        |        |        | STRESS |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  |     |      | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |
| .2240   | -489.  | 252.   | 659.   | 1028.    | -421.   | 1262.    |     |      | -.0168 | .0081  | .0052  | .0249  | .0178  | -.0015 | 675.   |
| .2250   | -395.  | 228.   | 578.   | 855.     | -449.   | 1044.    |     |      | -.0134 | .0048  | .0010  | .0153  | .0031  | -.0056 | 571.   |
| .2260   | -298.  | 237.   | 369.   | 505.     | -352.   | 850.     |     |      | -.0099 | .0021  | -.0033 | .0041  | -.0127 | -.0112 | 421.   |
| .2270   | -186.  | 262.   | 93.    | 60.      | -197.   | 658.     |     |      | -.0064 | .0001  | -.0075 | -.0084 | -.0286 | -.0170 | 277.   |
| .2280   | -60.   | 281.   | -164.  | -356.    | -63.    | 442.     |     |      | -.0027 | -.0011 | -.0112 | -.0219 | -.0439 | -.0219 | 229.   |
| .2290   | 76.    | 287.   | -324.  | -628.    | -21.    | 199.     |     |      | .0011  | -.0015 | -.0141 | -.0358 | -.0580 | -.0253 | 265.   |
| .2300   | 216.   | 278.   | -346.  | -702.    | -106.   | -52.     |     |      | .0047  | -.0012 | -.0160 | -.0496 | -.0695 | -.0269 | 286.   |
| .2310   | 348.   | 265.   | -239.  | -594.    | -300.   | -274.    |     |      | .0077  | -.0001 | -.0169 | -.0628 | -.0777 | -.0269 | 289.   |
| .2320   | 433.   | 251.   | -50.   | -362.    | -534.   | -418.    |     |      | .0095  | .0016  | -.0165 | -.0753 | -.0830 | -.0260 | 308.   |
| .2330   | 426.   | 212.   | 165.   | -95.     | -727.   | -441.    |     |      | .0098  | .0039  | -.0147 | -.0868 | -.0861 | -.0244 | 344.   |
| .2340   | 305.   | 137.   | 355.   | 127.     | -828.   | -313.    |     |      | .0087  | .0067  | -.0116 | -.0969 | -.0878 | -.0220 | 359.   |
| .2350   | 74.    | 56.    | 489.   | 269.     | -820.   | -19.     |     |      | .0067  | .0098  | -.0069 | -.1056 | -.0887 | -.0184 | 346.   |
| .2360   | -248.  | -18.   | 562.   | 337.     | -713.   | 417.     |     |      | .0042  | .0131  | -.0006 | -.1131 | -.0895 | -.0136 | 358.   |
| .2370   | -633.  | -116.  | 593.   | 346.     | -537.   | 920.     |     |      | .0018  | .0165  | .0072  | -.1192 | -.0895 | -.0076 | 449.   |
| .2380   | -1020. | -249.  | 607.   | 320.     | -345.   | 1396.    |     |      | -.0001 | .0198  | .0161  | -.1237 | -.0877 | -.0009 | 591.   |
| .2390   | -1346. | -380.  | 620.   | 296.     | -185.   | 1784.    |     |      | -.0014 | .0229  | .0256  | -.1265 | -.0836 | .0060  | 729.   |
| .2400   | -1585. | -483.  | 643.   | 297.     | -81.    | 2057.    |     |      | -.0020 | .0256  | .0350  | -.1278 | -.0775 | .0122  | 835.   |
| .2410   | -1737. | -574.  | 672.   | 312.     | -24.    | 2203.    |     |      | -.0018 | .0279  | .0434  | -.1275 | -.0694 | .0179  | 893.   |
| .2420   | -1797. | -659.  | 685.   | 299.     | 7.      | 2213.    |     |      | -.0009 | .0296  | .0503  | -.1255 | -.0599 | .0230  | 896.   |
| .2430   | -1763. | -737.  | 648.   | 212.     | 42.     | 2089.    |     |      | .0006  | .0308  | .0550  | -.1218 | -.0495 | .0278  | 843.   |
| .2440   | -1656. | -814.  | 548.   | 28.      | 108.    | 1857.    |     |      | .0025  | .0314  | .0574  | -.1167 | -.0384 | .0322  | 747.   |
| .2450   | -1496. | -883.  | 389.   | -240.    | 213.    | 1551.    |     |      | .0046  | .0313  | .0576  | -.1104 | -.0272 | .0359  | 636.   |
| .2460   | -1284. | -912.  | 181.   | -561.    | 340.    | 1195.    |     |      | .0069  | .0304  | .0560  | -.1039 | -.0162 | .0382  | 547.   |
| .2470   | -1026. | -894.  | -56.   | -905.    | 468.    | 803.     |     |      | .0092  | .0289  | .0530  | -.0979 | -.0059 | .0393  | 520.   |
| .2480   | -745.  | -871.  | -293.  | -1240.   | 582.    | 384.     |     |      | .0119  | .0268  | .0488  | -.0922 | .0039  | .0401  | 571.   |
| .2490   | -459.  | -866.  | -499.  | -1533.   | 670.    | -55.     |     |      | .0148  | .0241  | .0437  | -.0867 | .0132  | .0409  | 672.   |
| .2500   | -169.  | -843.  | -672.  | -1760.   | 721.    | -489.    |     |      | .0179  | .0209  | .0376  | -.0815 | .0210  | .0412  | 788.   |
| .2510   | 125.   | -774.  | -812.  | -1916.   | 733.    | -889.    |     |      | .0210  | .0174  | .0308  | -.0770 | .0267  | .0402  | 897.   |
| .2520   | 396.   | -676.  | -916.  | -2003.   | 719.    | -1229.   |     |      | .0239  | .0136  | .0233  | -.0729 | .0300  | .0381  | 986.   |
| .2530   | 616.   | -575.  | -983.  | -2031.   | 698.    | -1488.   |     |      | .0267  | .0098  | .0153  | -.0692 | .0309  | .0353  | 1048.  |
| .2540   | 774.   | -476.  | -1025. | -2012.   | 682.    | -1654.   |     |      | .0295  | .0061  | .0072  | -.0659 | .0296  | .0323  | 1081.  |
| .2550   | 874.   | -367.  | -1043. | -1948.   | 670.    | -1722.   |     |      | .0323  | .0026  | -.0004 | -.0636 | .0265  | .0290  | 1077.  |
| .2560   | 918.   | -243.  | -1028. | -1825.   | 652.    | -1690.   |     |      | .0351  | -.0006 | -.0072 | -.0625 | .0220  | .0253  | 1032.  |
| .2570   | 901.   | -106.  | -974.  | -1632.   | 623.    | -1559.   |     |      | .0379  | -.0034 | -.0128 | -.0630 | .0165  | .0212  | 940.   |
| .2580   | 827.   | 17.    | -877.  | -1380.   | 580.    | -1353.   |     |      | .0406  | -.0058 | -.0171 | -.0645 | .0103  | .0169  | 810.   |
| .2590   | 708.   | 106.   | -739.  | -1083.   | 520.    | -1102.   |     |      | .0431  | -.0080 | -.0203 | -.0666 | .0040  | .0129  | 654.   |
| .2600   | 556.   | 189.   | -575.  | -754.    | 449.    | -808.    |     |      | .0455  | -.0100 | -.0225 | -.0692 | -.0027 | .0091  | 479.   |
| .2610   | 375.   | 282.   | -398.  | -407.    | 376.    | -467.    |     |      | .0476  | -.0121 | -.0239 | -.0724 | -.0101 | .0056  | 291.   |

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ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |      |       |        |        |      |        |       |        |        |        |        |       |       |
|-------|------|-------|--------|--------|------|--------|-------|--------|--------|--------|--------|-------|-------|
| .2510 | 125. | -774. | -812.  | -1916. | 733. | -889.  | .0210 | .0174  | .0308  | -.0770 | .0267  | .0402 | 788.  |
| .2520 | 396. | -676. | -916.  | -2003. | 719. | -1229. | .0239 | .0136  | .0233  | -.0729 | .0300  | .0381 | 986.  |
| .2530 | 616. | -575. | -983.  | -2031. | 698. | -1488. | .0267 | .0098  | .0153  | -.0692 | .0309  | .0353 | 1048. |
| .2540 | 774. | -476. | -1025. | -2012. | 652. | -1654. | .0295 | .0061  | .0072  | -.0659 | .0296  | .0323 | 1081. |
| .2550 | 874. | -367. | -1043. | -1948. | 670. | -1722. | .0323 | .0026  | -.0004 | -.0636 | .0265  | .0290 | 1077. |
| .2560 | 918. | -243. | -1028. | -1825. | 652. | -1690. | .0351 | -.0006 | -.0072 | -.0625 | .0220  | .0253 | 1032. |
| .2570 | 901. | -106. | -974.  | -1632. | 623. | -1559. | .0379 | -.0034 | -.0128 | -.0630 | .0165  | .0212 | 940.  |
| .2580 | 827. | 17.   | -877.  | -1380. | 580. | -1353. | .0406 | -.0058 | -.0171 | -.0645 | .0103  | .0169 | 810.  |
| .2590 | 708. | 106.  | -739.  | -1083. | 520. | -1102. | .0431 | -.0080 | -.0203 | -.0666 | .0040  | .0129 | 654.  |
| .2600 | 556. | 189.  | -575.  | -754.  | 449. | -808.  | .0455 | -.0100 | -.0225 | -.0692 | -.0027 | .0091 | 479.  |
| .2610 | 375. | 282.  | -398.  | -407.  | 376. | -467.  | .0476 | -.0121 | -.0239 | -.0724 | -.0101 | .0056 | 291.  |

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ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
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CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1     | SEQUENCE | 815     | LOCATION | BEG   | TYPE   | RU     |        |        |        |        |  |  |
|---------|--------|--------|-------|----------|---------|----------|-------|--------|--------|--------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       | DX    | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)  | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |  |
| .2620   | 171.   | 359.   | -214. | -67.     | 305.    | -104.    | .0495 | -.0140 | -.0248 | -.0759 | -.0177 | .0026  | 132.   |  |  |
| .2630   | -38.   | 401.   | -35.  | 238.     | 237.    | 240.     | .0512 | -.0159 | -.0253 | -.0792 | -.0256 | .0004  | 166.   |  |  |
| .2640   | -228.  | 420.   | 122.  | 491.     | 175.    | 536.     | .0528 | -.0178 | -.0256 | -.0824 | -.0339 | -.0009 | 300.   |  |  |
| .2650   | -386.  | 419.   | 254.  | 687.     | 114.    | 767.     | .0544 | -.0198 | -.0258 | -.0855 | -.0423 | -.0012 | 415.   |  |  |
| .2660   | -509.  | 403.   | 364.  | 829.     | 49.     | 930.     | .0560 | -.0217 | -.0258 | -.0883 | -.0506 | -.0006 | 500.   |  |  |
| .2670   | -592.  | 373.   | 450.  | 918.     | -24.    | 1023.    | .0576 | -.0235 | -.0257 | -.0907 | -.0586 | .0009  | 552.   |  |  |
| .2680   | -631.  | 319.   | 510.  | 947.     | -104.   | 1030.    | .0593 | -.0253 | -.0257 | -.0923 | -.0663 | .0032  | 563.   |  |  |
| .2690   | -621.  | 250.   | 535.  | 911.     | -183.   | 948.     | .0609 | -.0270 | -.0257 | -.0930 | -.0737 | .0063  | 533.   |  |  |
| .2700   | -565.  | 193.   | 516.  | 811.     | -252.   | 805.     | .0625 | -.0286 | -.0257 | -.0930 | -.0811 | .0101  | 469.   |  |  |
| .2710   | -483.  | 145.   | 457.  | 650.     | -303.   | 631.     | .0637 | -.0298 | -.0257 | -.0924 | -.0880 | .0143  | 383.   |  |  |
| .2720   | -401.  | 56.    | 373.  | 430.     | -331.   | 430.     | .0645 | -.0304 | -.0258 | -.0911 | -.0937 | .0188  | 278.   |  |  |
| .2730   | -329.  | -88.   | 273.  | 164.     | -335.   | 204.     | .0646 | -.0305 | -.0259 | -.0888 | -.0980 | .0234  | 170.   |  |  |
| .2740   | -251.  | -210.  | 160.  | -109.    | -326.   | -16.     | .0640 | -.0306 | -.0259 | -.0859 | -.1014 | .0279  | 138.   |  |  |
| .2750   | -166.  | -272.  | 53.   | -343.    | -326.   | -201.    | .0628 | -.0308 | -.0260 | -.0822 | -.1037 | .0322  | 206.   |  |  |
| .2760   | -102.  | -332.  | -13.  | -515.    | -349.   | -346.    | .0609 | -.0308 | -.0260 | -.0774 | -.1044 | .0364  | 286.   |  |  |
| .2770   | -88.   | -443.  | -29.  | -628.    | -385.   | -456.    | .0585 | -.0306 | -.0260 | -.0713 | -.1036 | .0405  | 348.   |  |  |
| .2780   | -115.  | -566.  | -12.  | -684.    | -425.   | -515.    | .0554 | -.0304 | -.0259 | -.0642 | -.1018 | .0446  | 384.   |  |  |
| .2790   | -168.  | -642.  | 21.   | -682.    | -460.   | -498.    | .0518 | -.0303 | -.0254 | -.0568 | -.0992 | .0486  | 386.   |  |  |
| .2800   | -262.  | -687.  | 68.   | -639.    | -480.   | -388.    | .0476 | -.0300 | -.0248 | -.0490 | -.0959 | .0522  | 357.   |  |  |
| .2810   | -428.  | -760.  | 125.  | -580.    | -464.   | -189.    | .0427 | -.0295 | -.0241 | -.0410 | -.0921 | .0550  | 307.   |  |  |
| .2820   | -655.  | -851.  | 182.  | -514.    | -404.   | 85.      | .0372 | -.0287 | -.0236 | -.0327 | -.0878 | .0568  | 265.   |  |  |
| .2830   | -885.  | -900.  | 231.  | -433.    | -318.   | 399.     | .0314 | -.0281 | -.0235 | -.0244 | -.0830 | .0579  | 269.   |  |  |
| .2840   | -1079. | -886.  | 278.  | -323.    | -236.   | 718.     | .0256 | -.0276 | -.0240 | -.0160 | -.0777 | .0579  | 330.   |  |  |
| .2850   | -1243. | -859.  | 345.  | -174.    | -179.   | 1007.    | .0202 | -.0269 | -.0251 | -.0073 | -.0718 | .0565  | 416.   |  |  |
| .2860   | -1371. | -841.  | 445.  | 25.      | -160.   | 1232.    | .0154 | -.0259 | -.0269 | .0016  | -.0554 | .0539  | 499.   |  |  |
| .2870   | -1416. | -794.  | 560.  | 264.     | -191.   | 1356.    | .0119 | -.0248 | -.0292 | .0102  | -.0588 | .0501  | 559.   |  |  |
| .2880   | -1341. | -689.  | 657.  | 502.     | -265.   | 1353.    | .0097 | -.0234 | -.0317 | .0180  | -.0526 | .0452  | 589.   |  |  |
| .2890   | -1174. | -554.  | 713.  | 697.     | -353.   | 1235.    | .0091 | -.0217 | -.0344 | .0248  | -.0472 | .0390  | 586.   |  |  |
| .2900   | -958.  | -414.  | 718.  | 825.     | -422.   | 1043.    | .0100 | -.0197 | -.0371 | .0306  | -.0433 | .0318  | 560.   |  |  |
| .2910   | -701.  | -246.  | 657.  | 869.     | -451.   | 808.     | .0122 | -.0173 | -.0398 | .0352  | -.0412 | .0237  | 509.   |  |  |
| .2920   | -394.  | -40.   | 514.  | 810.     | -439.   | 531.     | .0155 | -.0149 | -.0425 | .0390  | -.0410 | .0151  | 427.   |  |  |
| .2930   | -54.   | 175.   | 309.  | 662.     | -390.   | 211.     | .0197 | -.0123 | -.0452 | .0422  | -.0421 | .0062  | 320.   |  |  |
| .2940   | 288.   | 381.   | 86.   | 487.     | -325.   | -121.    | .0243 | -.0098 | -.0477 | .0450  | -.0439 | -.0024 | 240.   |  |  |
| .2950   | 615.   | 591.   | -110. | 351.     | -278.   | -432.    | .0292 | -.0073 | -.0498 | .0474  | -.0452 | -.0103 | 250.   |  |  |
| .2960   | 928.   | 797.   | -251. | 290.     | -277.   | -719.    | .0339 | -.0047 | -.0513 | .0496  | -.0451 | -.0169 | 330.   |  |  |
| .2970   | 1213.  | 958.   | -320. | 310.     | -327.   | -993.    | .0381 | -.0023 | -.0520 | .0518  | -.0430 | -.0219 | 438.   |  |  |
| .2980   | 1439.  | 1063.  | -315. | 416.     | -411.   | -1228.   | .0415 | -.0001 | -.0518 | .0538  | -.0388 | -.0252 | 546.   |  |  |
| .2990   | 1585.  | 1143.  | -252. | 596.     | -505.   | -1371.   | .0438 | .0016  | -.0506 | .0558  | -.0330 | -.0265 | 633.   |  |  |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |       |       |      |       |        |       |        |        |       |        |        |      |
|-------|--------|-------|-------|------|-------|--------|-------|--------|--------|-------|--------|--------|------|
| .2890 | -1174. | -554. | 713.  | 697. | -353. | 1235.  | .0091 | -.0217 | -.0344 | .0248 | -.0472 | .0390  | 586. |
| .2900 | -958.  | -414. | 718.  | 825. | -422. | 1043.  | .0100 | -.0197 | -.0371 | .0306 | -.0433 | .0318  | 560. |
| .2910 | -701.  | -246. | 657.  | 869. | -451. | 808.   | .0122 | -.0173 | -.0398 | .0352 | -.0412 | .0237  | 509. |
| .2920 | -394.  | -40.  | 514.  | 810. | -439. | 531.   | .0155 | -.0149 | -.0425 | .0390 | -.0410 | .0151  | 427. |
| .2930 | -54.   | 175.  | 309.  | 662. | -390. | 211.   | .0197 | -.0123 | -.0452 | .0422 | -.0421 | .0062  | 320. |
| .2940 | 288.   | 381.  | 86.   | 487. | -325. | -121.  | .0243 | -.0098 | -.0477 | .0450 | -.0439 | -.0024 | 240. |
| .2950 | 615.   | 591.  | -110. | 351. | -278. | -432.  | .0292 | -.0073 | -.0498 | .0474 | -.0452 | -.0103 | 250. |
| .2960 | 928.   | 797.  | -251. | 290. | -277. | -719.  | .0339 | -.0047 | -.0513 | .0496 | -.0451 | -.0169 | 330. |
| .2970 | 1213.  | 958.  | -320. | 310. | -327. | -993.  | .0381 | -.0023 | -.0520 | .0518 | -.0430 | -.0219 | 438. |
| .2980 | 1439.  | 1063. | -315. | 416. | -411. | -1228. | .0415 | -.0001 | -.0518 | .0538 | -.0388 | -.0252 | 546. |
| .2990 | 1585.  | 1143. | -252. | 596. | -505. | -1371. | .0438 | .0016  | -.0506 | .0558 | -.0330 | -.0265 | 633. |

ADLPIPE PAGE 1915

DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50    | MEMBER | 1     | SEQUENCE | 815     | LOCATION | BEG    | TYPE   | RU     |       |        |        |        |  |  |
|---------|-------|--------|-------|----------|---------|----------|--------|--------|--------|-------|--------|--------|--------|--|--|
| TIME    | FX    | FY     | FZ    | MX       | MY      | MZ       | DX     | DY     | DZ     | RX    | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)  | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG) | (DEG)  | (DEG)  | (PSI)  |  |  |
| .3000   | 1643. | 1209.  | -152. | 814.     | -589.   | -1389.   | .0447  | .0027  | -.0486 | .0580 | -.0258 | -.0261 | 688.   |  |  |
| .3010   | 1600. | 1224.  | -40.  | 1020.    | -635.   | -1295.   | .0444  | .0034  | -.0459 | .0608 | -.0177 | -.0240 | 709.   |  |  |
| .3020   | 1459. | 1170.  | 66.   | 1182.    | -624.   | -1119.   | .0427  | .0035  | -.0426 | .0641 | -.0095 | -.0205 | 700.   |  |  |
| .3030   | 1248. | 1075.  | 153.  | 1297.    | -561.   | -885.    | .0400  | .0029  | -.0389 | .0679 | -.0016 | -.0157 | 669.   |  |  |
| .3040   | 1007. | 967.   | 228.  | 1377.    | -480.   | -618.    | .0367  | .0016  | -.0346 | .0719 | .0063  | -.0098 | 635.   |  |  |
| .3050   | 751.  | 832.   | 305.  | 1433.    | -404.   | -355.    | .0330  | -.0001 | -.0298 | .0760 | .0143  | -.0031 | 614.   |  |  |
| .3060   | 492.  | 643.   | 391.  | 1469.    | -341.   | -142.    | .0292  | -.0022 | -.0246 | .0800 | .0223  | .0042  | 608.   |  |  |
| .3070   | 267.  | 421.   | 471.  | 1475.    | -296.   | -19.     | .0256  | -.0048 | -.0192 | .0834 | .0302  | .0118  | 604.   |  |  |
| .3080   | 111.  | 208.   | 527.  | 1436.    | -271.   | 3.       | .0221  | -.0079 | -.0139 | .0860 | .0374  | .0191  | 586.   |  |  |
| .3090   | 18.   | 10.    | 548.  | 1336.    | -255.   | -58.     | .0188  | -.0112 | -.0089 | .0879 | .0438  | .0257  | 546.   |  |  |
| .3100   | -41.  | -187.  | 528.  | 1165.    | -223.   | -174.    | .0155  | -.0146 | -.0045 | .0890 | .0487  | .0313  | 481.   |  |  |
| .3110   | -69.  | -384.  | 458.  | 915.     | -160.   | -343.    | .0122  | -.0178 | -.0009 | .0893 | .0518  | .0357  | 397.   |  |  |
| .3120   | -40.  | -560.  | 332.  | 586.     | -77.    | -574.    | .0091  | -.0208 | .0019  | .0886 | .0531  | .0390  | 331.   |  |  |
| .3130   | 45.   | -709.  | 164.  | 202.     | 13.     | -859.    | .0062  | -.0234 | .0040  | .0871 | .0529  | .0413  | 354.   |  |  |
| .3140   | 153.  | -833.  | -16.  | -184.    | 98.     | -1155.   | .0035  | -.0255 | .0056  | .0847 | .0513  | .0427  | 471.   |  |  |
| .3150   | 269.  | -922.  | -178. | -522.    | 164.    | -1429.   | .0011  | -.0271 | .0068  | .0813 | .0487  | .0431  | 614.   |  |  |
| .3160   | 398.  | -965.  | -315. | -796.    | 198.    | -1677.   | -.0012 | -.0280 | .0078  | .0772 | .0453  | .0428  | 749.   |  |  |
| .3170   | 536.  | -974.  | -428. | -1008.   | 205.    | -1895.   | -.0035 | -.0283 | .0084  | .0728 | .0414  | .0415  | 865.   |  |  |
| .3180   | 650.  | -959.  | -509. | -1148.   | 199.    | -2046.   | -.0059 | -.0279 | .0087  | .0685 | .0368  | .0394  | 945.   |  |  |
| .3190   | 713.  | -905.  | -554. | -1201.   | 192.    | -2082.   | -.0087 | -.0269 | .0086  | .0645 | .0314  | .0365  | 968.   |  |  |
| .3200   | 722.  | -804.  | -566. | -1172.   | 185.    | -1988.   | -.0119 | -.0253 | .0081  | .0611 | .0255  | .0326  | 929.   |  |  |
| .3210   | 681.  | -681.  | -550. | -1079.   | 181.    | -1785.   | -.0155 | -.0231 | .0074  | .0583 | .0193  | .0279  | 840.   |  |  |
| .3220   | 588.  | -558.  | -504. | -927.    | 181.    | -1497.   | -.0193 | -.0205 | .0068  | .0563 | .0133  | .0226  | 710.   |  |  |
| .3230   | 449.  | -423.  | -427. | -705.    | 183.    | -1130.   | -.0232 | -.0177 | .0065  | .0546 | .0077  | .0168  | 539.   |  |  |
| .3240   | 280.  | -258.  | -317. | -415.    | 171.    | -692.    | -.0270 | -.0151 | .0065  | .0532 | .0031  | .0106  | 331.   |  |  |
| .3250   | 97.   | -76.   | -182. | -76.     | 140.    | -216.    | -.0304 | -.0126 | .0069  | .0521 | -.0003 | .0042  | 108.   |  |  |
| .3260   | -90.  | 91.    | -32.  | 279.     | 101.    | 253.     | -.0334 | -.0104 | .0075  | .0514 | -.0025 | -.0024 | 157.   |  |  |
| .3270   | -267. | 240.   | 110.  | 618.     | 67.     | 680.     | -.0357 | -.0088 | .0081  | .0510 | -.0040 | -.0090 | 370.   |  |  |
| .3280   | -410. | 386.   | 227.  | 912.     | 40.     | 1047.    | -.0372 | -.0079 | .0085  | .0511 | -.0049 | -.0153 | 558.   |  |  |
| .3290   | -513. | 528.   | 312.  | 1144.    | 17.     | 1346.    | -.0380 | -.0077 | .0085  | .0516 | -.0052 | -.0213 | 709.   |  |  |
| .3300   | -580. | 644.   | 366.  | 1304.    | 4.      | 1562.    | -.0380 | -.0082 | .0082  | .0524 | -.0052 | -.0270 | 817.   |  |  |
| .3310   | -608. | 721.   | 386.  | 1384.    | 2.      | 1673.    | -.0372 | -.0096 | .0077  | .0531 | -.0049 | -.0322 | 871.   |  |  |
| .3320   | -576. | 773.   | 367.  | 1382.    | 3.      | 1662.    | -.0355 | -.0119 | .0071  | .0536 | -.0041 | -.0366 | 867.   |  |  |
| .3330   | -479. | 813.   | 315.  | 1308.    | -3.     | 1537.    | -.0330 | -.0151 | .0065  | .0537 | -.0026 | -.0400 | 810.   |  |  |
| .3340   | -345. | 828.   | 241.  | 1178.    | -13.    | 1328.    | -.0298 | -.0190 | .0061  | .0533 | -.0002 | -.0424 | 712.   |  |  |
| .3350   | -198. | 806.   | 152.  | 997.     | -16.    | 1057.    | -.0262 | -.0234 | .0059  | .0524 | .0027  | -.0437 | 583.   |  |  |
| .3360   | -34.  | 760.   | 42.   | 764.     | -7.     | 735.     | -.0223 | -.0281 | .0056  | .0512 | .0062  | -.0441 | 426.   |  |  |
| .3370   | 149.  | 699.   | -92.  | 481.     | 15.     | 374.     | -.0184 | -.0331 | .0053  | .0498 | .0100  | -.0434 | 244.   |  |  |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |       |      |      |       |      |       |        |        |        |       |        |        |      |
|-------|-------|------|------|-------|------|-------|--------|--------|--------|-------|--------|--------|------|
| .3270 | -267. | 240. | 110. | 618.  | 67.  | 680.  | -.0357 | -.0088 | .0081  | .0510 | -.0040 | -.0090 | 370. |
| .3280 | -410. | 386. | 727. | 912.  | 40.  | 1047. | -.0372 | -.0079 | .0085  | .0511 | -.0049 | -.0153 | 558. |
| .3290 | -513. | 526. | 312. | 1144. | 17.  | 1346. | -.0380 | -.0077 | .0085  | .0516 | -.0052 | -.0213 | 709. |
| .3300 | -580. | 644. | 366. | 1304. | 4.   | 1562. | -.0380 | -.0082 | -.0082 | .0524 | -.0052 | -.0270 | 817. |
| .3310 | -608. | 721. | 386. | 1384. | 2.   | 1673. | -.0372 | -.0096 | .0077  | .0531 | -.0049 | -.0322 | 871. |
| .3320 | -576. | 773. | 367. | 1382. | 3.   | 1662. | -.0355 | -.0119 | .0071  | .0536 | -.0041 | -.0366 | 867. |
| .3330 | -479. | 813. | 315. | 1308. | -3.  | 1537. | -.0330 | -.0151 | .0065  | .0537 | -.0026 | -.0400 | 810. |
| .3340 | -345. | 828. | 241. | 1178. | -13. | 1228. | -.0298 | -.0190 | .0061  | .0533 | -.0002 | -.0424 | 712. |
| .3350 | -198. | 806. | 152. | 997.  | -16. | 1057. | -.0262 | -.0234 | .0059  | .0524 | .0027  | -.0437 | 583. |
| .3360 | -34.  | 760. | 42.  | 764.  | -7.  | 735.  | -.0223 | -.0281 | .0056  | .0512 | .0062  | -.0441 | 426. |
| .3370 | 149.  | 699. | -92. | 481.  | 15.  | 374.  | -.0184 | -.0331 | .0053  | .0498 | .0100  | -.0434 | 244. |

ADLPIPE PAGE 1916

DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1     | SEQUENCE | 815     | LOCATION | BEG    | TYPE   | RU     | DX     | DY     | DZ     | RX    | RY    | RZ    | STRESS |
|---------|--------|--------|-------|----------|---------|----------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       |        |        |        | (IN)   | (IN)   | (IN)   | (DEG) | (DEG) | (DEG) | (PSI)  |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  |        |        |        |        |        |        |       |       |       |        |
| .3380   | 325.   | 617.   | -236. | 167.     | 51.     | 5.       | -.0146 | -.0380 | .0043  | .0484  | .0142  | -.0420 | 70.   |       |       |        |
| .3390   | 469.   | 513.   | -369. | -143.    | 101.    | -333.    | -.0111 | -.0427 | .0042  | .0468  | .0186  | -.0399 | 151.  |       |       |        |
| .3400   | 582.   | 409.   | -479. | -420.    | 150.    | -626.    | -.0081 | -.0469 | .0036  | .0451  | .0234  | -.0374 | 308.  |       |       |        |
| .3410   | 678.   | 314.   | -560. | -649.    | 184.    | -876.    | -.0055 | -.0507 | .0032  | .0430  | .0288  | -.0344 | 444.  |       |       |        |
| .3420   | 746.   | 216.   | -603. | -816.    | 200.    | -1081.   | -.0033 | -.0538 | .0030  | .0407  | .0347  | -.0312 | 549.  |       |       |        |
| .3430   | 768.   | 114.   | -599. | -907.    | 203.    | -1218.   | -.0017 | -.0562 | .0033  | .0380  | .0409  | -.0279 | 615.  |       |       |        |
| .3440   | 744.   | 28.    | -554. | -918.    | 194.    | -1266.   | -.0005 | -.0578 | .0039  | .0349  | .0472  | -.0248 | 632.  |       |       |        |
| .3450   | 680.   | -30.   | -482. | -870.    | 181.    | -1224.   | .0001  | -.0585 | .0050  | .0315  | .0534  | -.0222 | 607.  |       |       |        |
| .3460   | 581.   | -76.   | -398. | -788.    | 178.    | -1108.   | .0001  | -.0583 | .0063  | .0279  | .0592  | -.0202 | 550.  |       |       |        |
| .3470   | 444.   | -120.  | -309. | -684.    | 195.    | -933.    | -.0003 | -.0575 | .0077  | .0242  | .0644  | -.0190 | 471.  |       |       |        |
| .3480   | 286.   | -148.  | -220. | -562.    | 225.    | -708.    | -.0010 | -.0560 | .0092  | .0204  | .0688  | -.0187 | 374.  |       |       |        |
| .3490   | 129.   | -138.  | -133. | -422.    | 253.    | -450.    | -.0020 | -.0540 | .0106  | .0164  | .0723  | -.0194 | 267.  |       |       |        |
| .3500   | -9.    | -100.  | -45.  | -264.    | 267.    | -191.    | -.0029 | -.0516 | .0120  | .0124  | .0751  | -.0210 | 169.  |       |       |        |
| .3510   | -118.  | -55.   | 43.   | -99.     | 263.    | 27.      | -.0037 | -.0490 | .0131  | .0083  | .0770  | -.0235 | 113.  |       |       |        |
| .3520   | -181.  | -7.    | 124.  | 61.      | 239.    | 177.     | -.0041 | -.0462 | .0138  | .0044  | .0779  | -.0268 | 122.  |       |       |        |
| .3530   | -185.  | 58.    | 186.  | 199.     | 194.    | 253.     | -.0040 | -.0434 | .0141  | .0008  | .0778  | -.0306 | 151.  |       |       |        |
| .3540   | -135.  | 143.   | 222.  | 302.     | 137.    | 266.     | -.0035 | -.0406 | .0138  | -.0024 | .0765  | -.0350 | 171.  |       |       |        |
| .3550   | -49.   | 229.   | 224.  | 352.     | 88.     | 220.     | -.0027 | -.0379 | .0128  | -.0050 | .0741  | -.0397 | 170.  |       |       |        |
| .3560   | 66.    | 303.   | 183.  | 330.     | 59.     | 116.     | -.0017 | -.0354 | .0112  | -.0071 | .0704  | -.0447 | 142.  |       |       |        |
| .3570   | 209.   | 372.   | 98.   | 236.     | 50.     | -37.     | -.0005 | -.0331 | .0090  | -.0085 | .0658  | -.0497 | 98.   |       |       |        |
| .3580   | 371.   | 440.   | -18.  | 88.      | 54.     | -219.    | .0005  | -.0311 | .0064  | -.0092 | .0605  | -.0544 | 97.   |       |       |        |
| .3590   | 528.   | 500.   | -143. | -82.     | 65.     | -404.    | .0014  | -.0294 | .0035  | -.0094 | .0546  | -.0587 | 167.  |       |       |        |
| .3600   | 667.   | 540.   | -255. | -248.    | 69.     | -581.    | .0020  | -.0279 | .0006  | -.0091 | .0485  | -.0625 | 255.  |       |       |        |
| .3610   | 769.   | 558.   | -344. | -394.    | 56.     | -749.    | .0021  | -.0264 | -.0023 | -.0082 | .0423  | -.0654 | 340.  |       |       |        |
| .3620   | 883.   | 552.   | -401. | -506.    | 21.     | -893.    | .0016  | -.0249 | -.0049 | -.0067 | .0361  | -.0673 | 412.  |       |       |        |
| .3630   | 928.   | 521.   | -420. | -575.    | -27.    | -982.    | .0006  | -.0235 | -.0071 | -.0047 | .0297  | -.0681 | 457.  |       |       |        |
| .3640   | 905.   | 475.   | -404. | -598.    | -76.    | -984.    | -.0011 | -.0219 | -.0087 | -.0024 | .0229  | -.0677 | 463.  |       |       |        |
| .3650   | 813.   | 420.   | -364. | -589.    | -116.   | -884.    | -.0035 | -.0203 | -.0097 | -.0002 | .0157  | -.0663 | 429.  |       |       |        |
| .3660   | 651.   | 350.   | -312. | -566.    | -134.   | -688.    | -.0065 | -.0184 | -.0101 | .0020  | .0083  | -.0637 | 362.  |       |       |        |
| .3670   | 423.   | 258.   | -253. | -537.    | -123.   | -405.    | -.0100 | -.0162 | -.0098 | .0038  | .0007  | -.0601 | 274.  |       |       |        |
| .3680   | 136.   | 157.   | -185. | -494.    | -87.    | -42.     | -.0140 | -.0139 | -.0089 | .0051  | -.0069 | -.0556 | 202.  |       |       |        |
| .3690   | -186.  | 66.    | -105. | -424.    | -42.    | 386.     | -.0181 | -.0113 | -.0076 | .0058  | -.0141 | -.0503 | 231.  |       |       |        |
| .3700   | -516.  | -14.   | -8.   | -324.    | -3.     | 841.     | -.0222 | -.0084 | -.0061 | .0058  | -.0207 | -.0446 | 362.  |       |       |        |
| .3710   | -833.  | -99.   | 107.  | -196.    | 18.     | 1275.    | -.0260 | -.0054 | -.0046 | .0052  | -.0264 | -.0386 | 518.  |       |       |        |
| .3720   | -1114. | -190.  | 238.  | -45.     | 18.     | 1652.    | -.0294 | -.0023 | -.0032 | .0041  | -.0312 | -.0326 | 663.  |       |       |        |
| .3730   | -1340. | -265.  | 373.  | 121.     | -8.     | 1957.    | -.0320 | .0006  | -.0022 | .0024  | -.0352 | -.0269 | 787.  |       |       |        |
| .3740   | -1498. | -304.  | 497.  | 287.     | -53.    | 2188.    | -.0337 | .0033  | -.0016 | -.0001 | -.0384 | -.0218 | 886.  |       |       |        |
| .3750   | -1589. | -320.  | 596.  | 426.     | -103.   | 2334.    | -.0344 | .0057  | -.0013 | -.0031 | -.0413 | -.0175 | 953.  |       |       |        |

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ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

|       |        |       |       |       |       |       |        |        |        |        |        |        |      |
|-------|--------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|------|
| .3650 | 81.    | 420.  | 364.  | -589. | -116. | -884. | -.035  | -.0203 | -.0097 | -.0002 | .0157  | -.0663 | 429. |
| .3660 | 651.   | 350.  | -312. | -566. | -134. | -688. | -.065  | -.0184 | -.0101 | .0020  | .0083  | -.0637 | 362. |
| .3670 | 423.   | 258.  | -253. | -537. | -123. | -405. | -.0100 | -.0162 | -.0098 | .0038  | .0007  | -.0601 | 274. |
| .3680 | 136.   | 157.  | -185. | -494. | -87.  | -42.  | -.0140 | -.0139 | -.0089 | .0051  | -.0269 | -.0556 | 202. |
| .3690 | -166.  | 66.   | -105. | -424. | -42.  | 386.  | -.0181 | -.0113 | -.0076 | .0056  | -.0141 | -.0503 | 231. |
| .3700 | -516.  | 14.   | -8.   | -324. | -3.   | 841.  | -.0222 | -.0084 | -.0061 | .0058  | -.0207 | -.0446 | 362. |
| .3710 | -833.  | -69.  | 107.  | -196. | 18.   | 1275. | -.0260 | -.0054 | -.0046 | .0052  | -.0264 | -.0386 | 518. |
| .3720 | -1114. | -190. | 238.  | -45.  | 18.   | 1652. | -.0294 | -.0023 | -.0032 | .0041  | -.0312 | -.0326 | 663. |
| .3730 | -1340. | -265. | 373.  | 121.  | -8.   | 1957. | -.0320 | .0006  | -.0022 | .0024  | -.0352 | -.0269 | 787. |
| .3740 | -1498. | -304. | 497.  | 257.  | -53.  | 2138. | -.0337 | .0033  | -.0016 | -.0001 | -.0384 | -.0218 | 886. |
| .3750 | -1589. | -320. | 596.  | 426.  | -103. | 2334. | -.0344 | .0057  | -.0013 | -.0031 | -.0413 | -.0175 | 953. |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEAUNEE GKW03F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1     | SEQUENCE | 815     | LOCATION | BEG    | TYPE   | RU     |        |        |        |  | STRESS |
|---------|--------|--------|-------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--|--------|
| TIME    | FX     | FY     | FZ    | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     |  | (PSI)  |
| (SEC)   | (LB)   | (LB)   | (LB)  | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  |  |        |
| .3760   | -1616. | -335.  | 655.  | 509.     | -140.   | 2378.    | -.0340 | .0076  | -.0014 | -.0068 | -.0439 | -.0141 |  | 977.   |
| .3770   | -1577. | -348.  | 660.  | 518.     | -156.   | 2316.    | -.0325 | .0089  | -.0018 | -.0110 | -.0466 | -.0116 |  | 955.   |
| .3780   | -1473. | -340.  | 612.  | 460.     | -154.   | 2166.    | -.0299 | .0096  | -.0024 | -.0155 | -.0494 | -.0101 |  | 891.   |
| .3790   | -1317. | -305.  | 522.  | 352.     | -136.   | 1950.    | -.0262 | .0094  | -.0032 | -.0203 | -.0522 | -.0094 |  | 797.   |
| .3800   | -1127. | -262.  | 405.  | 211.     | -108.   | 1679.    | -.0218 | .0084  | -.0040 | -.0250 | -.0549 | -.0094 |  | 680.   |
| .3810   | -909.  | -221.  | 274.  | 53.      | -78.    | 1357.    | -.0169 | .0067  | -.0048 | -.0297 | -.0572 | -.0101 |  | 546.   |
| .3820   | -671.  | -186.  | 146.  | -101.    | -57.    | 994.     | -.0117 | .0044  | -.0055 | -.0339 | -.0586 | -.0110 |  | 402.   |
| .3830   | -431.  | -157.  | 36.   | -231.    | -48.    | 619.     | -.0065 | .0015  | -.0060 | -.0377 | -.0589 | -.0121 |  | 266.   |
| .3840   | -215.  | -132.  | -47.  | -321.    | -47.    | 275.     | -.0018 | -.0018 | -.0061 | -.0410 | -.0580 | -.0130 |  | 171.   |
| .3850   | -43.   | -117.  | -101. | -369.    | -47.    | -15.     | .0023  | -.0054 | -.0058 | -.0437 | -.0557 | -.0135 |  | 149.   |
| .3860   | 79.    | -126.  | -129. | -386.    | -40.    | -246.    | .0056  | -.0091 | -.0051 | -.0457 | -.0519 | -.0134 |  | 184.   |
| .3870   | 143.   | -161.  | -136. | -384.    | -15.    | -407.    | .0078  | -.0130 | -.0039 | -.0468 | -.0467 | -.0126 |  | 225.   |
| .3880   | 144.   | -195.  | -130. | -359.    | 32.     | -477.    | .0090  | -.0169 | -.0022 | -.0470 | -.0402 | -.0109 |  | 240.   |
| .3890   | 89.    | -220.  | -110. | -306.    | 97.     | -445.    | .0093  | -.0207 | -.0001 | -.0465 | -.0326 | -.0084 |  | 220.   |
| .3900   | -11.   | -239.  | -76.  | -233.    | 173.    | -334.    | .0086  | -.0240 | .0024  | -.0450 | -.0239 | -.0051 |  | 178.   |
| .3910   | -142.  | -284.  | -35.  | -159.    | 256.    | -189.    | .0072  | -.0265 | .0050  | -.0426 | -.0144 | -.0009 |  | 143.   |
| .3920   | -286.  | -354.  | 10.   | -89.     | 340.    | -37.     | .0052  | -.0280 | .0076  | -.0393 | -.0045 | .0040  |  | 142.   |
| .3930   | -419.  | -414.  | 54.   | -18.     | 417.    | 117.     | .0029  | -.0286 | .0101  | -.0353 | .0055  | .0095  |  | 174.   |
| .3940   | -528.  | -440.  | 91.   | 53.      | 480.    | 273.     | .0003  | -.0284 | .0124  | -.0308 | .0152  | .0155  |  | 223.   |
| .3950   | -611.  | -449.  | 112.  | 103.     | 536.    | 413.     | -.0023 | -.0271 | .0143  | -.0258 | .0244  | .0216  |  | 275.   |
| .3960   | -662.  | -459.  | 108.  | 113.     | 592.    | 511.     | -.0050 | -.0249 | .0157  | -.0206 | .0329  | .0274  |  | 317.   |
| .3970   | -665.  | -460.  | 72.   | 77.      | 650.    | 553.     | -.0075 | -.0218 | .0166  | -.0152 | .0404  | .0329  |  | 344.   |
| .3980   | -615.  | -429.  | 0.    | -4.      | 707.    | 547.     | -.0098 | -.0180 | .0169  | -.0099 | .0467  | .0380  |  | 358.   |
| .3990   | -519.  | -366.  | -99.  | -116.    | 755.    | 505.     | -.0118 | -.0136 | .0167  | -.0049 | .0517  | .0425  |  | 368.   |
| .4000   | -392.  | -293.  | -213. | -250.    | 794.    | 428.     | -.0133 | -.0085 | .0161  | -.0002 | .0553  | .0464  |  | 375.   |

MAXIMUM VALUE OF STRESS OCCURS AT

| TIME  | FX    | FY    | FZ    | MX      | MY      | MZ      | DX     | DY     | DZ    | RX    | RY    | RZ    | STRESS |
|-------|-------|-------|-------|---------|---------|---------|--------|--------|-------|-------|-------|-------|--------|
| (SEC) | (LB)  | (LB)  | (LB)  | (FT-LB) | (FT-LB) | (FT-LB) | (IN)   | (IN)   | (IN)  | (DEG) | (DEG) | (DEG) | (PSI)  |
| .1690 | -893. | 1375. | 1040. | 2206.   | -789.   | 3067.   | -.0318 | -.0172 | .0045 | .0474 | .0595 | .0151 | 1549.  |

| SECTION | 50   | MEMBER | 1    | SEQUENCE | 70      | LOCATION | END  | TYPE | RU   |       |       |       |  | STRESS |
|---------|------|--------|------|----------|---------|----------|------|------|------|-------|-------|-------|--|--------|
| TIME    | FX   | FY     | FZ   | MX       | MY      | MZ       | DX   | DY   | DZ   | RX    | RY    | RZ    |  | (PSI)  |
| (SEC)   | (LB) | (LB)   | (LB) | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN) | (IN) | (IN) | (DEG) | (DEG) | (DEG) |  |        |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

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S/RV PIPING KEAUNEE GKW03F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | DX (IN) | DY (IN) | DZ (IN) | RX (DEG) | RY (DEG) | RZ (DEG) | STRESS (PSI) |
|------------|---------|---------|---------|------------|------------|------------|---------|---------|---------|----------|----------|----------|--------------|
| .1690      | -893.   | 1375.   | 1040.   | 2206.      | -729.      | 3067.      | -.0318  | -.0172  | .0045   | .0474    | .0595    | .0151    | 1549.        |

| SECTION    | 50      | MEMBER  | 1       | SEQUENCE   | 70         | LOCATION   | END  | TYPE | RU   | DX    | DY    | DZ    | RX    | RY    | RZ    | STRESS (PSI) |
|------------|---------|---------|---------|------------|------------|------------|------|------|------|-------|-------|-------|-------|-------|-------|--------------|
| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | (IN) | (IN) | (IN) | (DEG) | (DEG) | (DEG) | (DEG) | (DEG) | (DEG) | (PSI)        |

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DIS/AD PIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.03.

S/RV PIPING KEMAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION    | 50      | MEMBER  | 1       | SEQUENCE   | 70         | LOCATION   | END    | TYPE   | RU     | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS (PSI) |
|------------|---------|---------|---------|------------|------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------|
| TIME (SEC) | FX (LB) | FY (LB) | FZ (LB) | MX (FT-LB) | MY (FT-LB) | MZ (FT-LB) | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (DEG)  | (DEG)  | (DEG)  | (PSI)        |
| 0.0000     | 0.      | 0.      | 0.      | 0.         | 0.         | 0.         | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.           |
| .0010      | 0.      | -0.     | 0.      | -0.        | 0.         | -0.        | .0000  | -.0000 | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | 0.           |
| .0020      | 0.      | -1.     | 1.      | 0.         | 0.         | -0.        | .0000  | -.0000 | .0000  | -.0000 | -.0000 | -.0000 | -.0000 | -.0000 | .0000  | 0.           |
| .0030      | 1.      | -1.     | 2.      | 1.         | -0.        | -1.        | -.0000 | -.0000 | -.0000 | -.0001 | -.0001 | -.0001 | -.0001 | -.0001 | .0001  | 1.           |
| .0040      | 5.      | -2.     | 4.      | 3.         | -2.        | -5.        | -.0000 | -.0000 | -.0000 | -.0002 | -.0001 | -.0001 | -.0001 | -.0001 | .0002  | 2.           |
| .0050      | 12.     | -1.     | 8.      | 8.         | -6.        | -12.       | -.0001 | -.0000 | -.0001 | -.0004 | -.0002 | -.0002 | -.0002 | -.0002 | .0005  | 6.           |
| .0060      | 24.     | 3.      | 13.     | 14.        | -12.       | -23.       | -.0002 | -.0000 | -.0002 | -.0008 | -.0002 | -.0002 | -.0002 | -.0002 | .0011  | 12.          |
| .0070      | 41.     | 6.      | 19.     | 21.        | -20.       | -39.       | -.0005 | -.0000 | -.0004 | -.0013 | -.0004 | -.0004 | -.0004 | -.0004 | .0019  | 20.          |
| .0080      | 63.     | 2.      | 25.     | 26.        | -28.       | -63.       | -.0009 | -.0001 | -.0008 | -.0020 | -.0008 | -.0008 | -.0008 | -.0008 | .0027  | 30.          |
| .0090      | 100.    | 0.      | 27.     | 30.        | -39.       | -100.      | -.0016 | -.0001 | -.0013 | -.0029 | -.0010 | -.0010 | -.0010 | -.0010 | .0040  | 45.          |
| .0100      | 157.    | 10.     | 23.     | 30.        | -59.       | -156.      | -.0026 | -.0001 | -.0019 | -.0036 | -.0004 | -.0004 | -.0004 | -.0004 | .0061  | 68.          |
| .0110      | 238.    | 37.     | 12.     | 26.        | -89.       | -232.      | -.0040 | -.0000 | -.0027 | -.0042 | .0015  | .0015  | .0015  | .0015  | .0088  | 100.         |
| .0120      | 334.    | 80.     | -8.     | 17.        | -129.      | -320.      | -.0061 | -.0000 | -.0035 | -.0049 | .0051  | .0051  | .0051  | .0051  | .0117  | 139.         |
| .0130      | 429.    | 129.    | -38.    | 3.         | -174.      | -407.      | -.0087 | -.0001 | -.0043 | -.0060 | .0105  | .0105  | .0105  | .0105  | .0139  | 178.         |
| .0140      | 504.    | 172.    | -76.    | -18.       | -217.      | -478.      | -.0118 | -.0004 | -.0050 | -.0079 | .0175  | .0175  | .0175  | .0175  | .0147  | 211.         |
| .0150      | 541.    | 199.    | -123.   | -46.       | -248.      | -513.      | -.0148 | -.0009 | -.0056 | -.0105 | .0252  | .0252  | .0252  | .0252  | .0140  | 229.         |
| .0160      | 522.    | 217.    | -176.   | -78.       | -258.      | -494.      | -.0172 | -.0014 | -.0061 | -.0131 | .0329  | .0329  | .0329  | .0329  | .0121  | 226.         |
| .0170      | 434.    | 217.    | -227.   | -113.      | -241.      | -405.      | -.0183 | -.0019 | -.0066 | -.0146 | .0393  | .0393  | .0393  | .0393  | .0091  | 194.         |
| .0180      | 278.    | 185.    | -258.   | -144.      | -198.      | -244.      | -.0176 | -.0023 | -.0067 | -.0141 | .0438  | .0438  | .0438  | .0438  | .0050  | 139.         |
| .0190      | 68.     | 122.    | -251.   | -158.      | -144.      | -27.       | -.0148 | -.0026 | -.0063 | -.0112 | .0471  | .0471  | .0471  | .0471  | -.0001 | 86.          |
| .0200      | -173.   | -2.     | -180.   | -143.      | -97.       | 218.       | -.0100 | -.0027 | -.0046 | -.0064 | .0498  | .0498  | .0498  | .0498  | -.0063 | 111.         |
| .0210      | -403.   | -149.   | -41.    | -80.       | -86.       | 450.       | -.0036 | -.0025 | -.0015 | -.0005 | .0537  | .0537  | .0537  | .0537  | -.0124 | 187.         |
| .0220      | -562.   | -138.   | 145.    | 70.        | -156.      | 635.       | .0036  | -.0021 | .0029  | .0061  | .0633  | .0633  | .0633  | .0633  | -.0159 | 264.         |
| .0230      | -676.   | -52.    | 386.    | 296.       | -289.      | 780.       | .0109  | -.0017 | .0082  | .0104  | .0757  | .0757  | .0757  | .0757  | -.0183 | 354.         |
| .0240      | -836.   | -68.    | 649.    | 535.       | -407.      | 939.       | .0176  | -.0020 | .0136  | .0101  | .0837  | .0837  | .0837  | .0837  | -.0234 | 483.         |
| .0250      | -1046.  | -297.   | 880.    | 695.       | -440.      | 1098.      | .0235  | -.0027 | .0179  | .0075  | .0819  | .0819  | .0819  | .0819  | -.0320 | 550.         |
| .0260      | -1171.  | -540.   | 994.    | 726.       | -398.      | 1170.      | .0286  | -.0028 | .0199  | .0099  | .0740  | .0740  | .0740  | .0740  | -.0382 | 575.         |
| .0270      | -1174.  | -374.   | 898.    | 669.       | -339.      | 1186.      | .0324  | -.0014 | .0191  | .0199  | .0702  | .0702  | .0702  | .0702  | -.0371 | 563.         |
| .0280      | -1288.  | -186.   | 681.    | 526.       | -203.      | 1303.      | .0349  | .0003  | .0174  | .0273  | .0639  | .0639  | .0639  | .0639  | -.0367 | 570.         |
| .0290      | -1540.  | -508.   | 484.    | 258.       | 70.        | 1472.      | .0371  | .0012  | .0169  | .0267  | .0443  | .0443  | .0443  | .0443  | -.0430 | 601.         |
| .0300      | -1497.  | -591.   | 186.    | -72.       | 334.       | 1398.      | .0383  | .0027  | .0173  | .0302  | .0267  | .0267  | .0267  | .0267  | -.0419 | 577.         |
| .0310      | -1145.  | -295.   | -225.   | -418.      | 505.       | 1067.      | .0380  | .0051  | .0189  | .0383  | .0172  | .0172  | .0172  | .0172  | -.0306 | 503.         |
| .0320      | -739.   | -220.   | -424.   | -639.      | 558.       | 648.       | .0357  | .0069  | .0225  | .0392  | .0056  | .0056  | .0056  | .0056  | -.0208 | 428.         |
| .0330      | -276.   | -284.   | -300.   | -588.      | 444.       | 171.       | .0305  | .0079  | .0271  | .0305  | -.0074 | -.0074 | -.0074 | -.0074 | -.0164 | 304.         |
| .0340      | 319.    | -162.   | -123.   | -385.      | 198.       | -428.      | .0224  | .0089  | .0299  | .0195  | -.0158 | -.0158 | -.0158 | -.0158 | -.0121 | 244.         |
| .0350      | 914.    | -120.   | -63.    | -269.      | -13.       | -1087.     | .0125  | .0100  | .0291  | .0110  | -.0268 | -.0268 | -.0268 | -.0268 | -.0072 | 449.         |
| .0360      | 1391.   | -236.   | -79.    | -269.      | -89.       | -1631.     | .0023  | .0112  | .0241  | .0068  | -.0466 | -.0466 | -.0466 | -.0466 | -.0030 | 664.         |
| .0370      | 1721.   | -34.    | -214.   | -318.      | -63.       | -1911.     | -.0077 | .0130  | .0154  | .0084  | -.0640 | -.0640 | -.0640 | -.0640 | .0036  | 778.         |

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S/RV PIPING KEMAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |       |       |       |       |        |        |        |       |       |        |        |      |
|-------|--------|-------|-------|-------|-------|--------|--------|--------|-------|-------|--------|--------|------|
| .0270 | -1174. | -374. | 898.  | 669.  | -339. | 1186.  | .0324  | -.0014 | .0191 | .0199 | .0740  | -.0382 | 575. |
| .0280 | -1288. | -186. | 681.  | 526.  | -203. | 1303.  | .0349  | .0003  | .0174 | .0273 | .0639  | -.0367 | 570. |
| .0290 | -1540. | -508. | 484.  | 258.  | 70.   | 1472.  | .0371  | .0012  | .0169 | .0267 | .0443  | -.0430 | 601. |
| .0300 | -1497. | -591. | 186.  | -72.  | 334.  | 1398.  | .0383  | .0027  | .0173 | .0302 | .0267  | -.0419 | 577. |
| .0310 | -1145. | -295. | -225. | -418. | 505.  | 1067.  | .0380  | .0051  | .0189 | .0383 | .0172  | -.0306 | 503. |
| .0320 | -739.  | -220. | -424. | -639. | 558.  | 648.   | .0357  | .0069  | .0225 | .0392 | .0056  | -.0208 | 428. |
| .0330 | -276.  | -284. | -300. | -588. | 444.  | 171.   | .0305  | .0079  | .0271 | .0305 | -.0074 | -.0164 | 304. |
| .0340 | 319.   | -162. | -123. | -385. | 198.  | -428.  | .0224  | .0089  | .0299 | .0195 | -.0158 | -.0121 | 244. |
| .0350 | 914.   | -120. | -68.  | -269. | -13.  | -1087. | .0125  | .0100  | .0291 | .0110 | -.0268 | -.0072 | 449. |
| .0360 | 1391.  | -236. | -79.  | -269. | -89.  | -1631. | .0023  | .0112  | .0241 | .0068 | -.0466 | -.0030 | 664. |
| .0370 | 1721.  | -34.  | -214. | -318. | -62.  | -1911. | -.0077 | .0130  | .0154 | .0084 | -.0640 | .0036  | 778. |

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18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK

2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1      | SEQUENCE | 70      | LOCATION | END    | TYPE   | RU     |        |        |        |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |  |
| .0380   | 1754.  | 443.   | -598.  | -496.    | 78.     | -1844.   | -.0169 | .0148  | .0048  | .0114  | -.0702 | .0103  | 767.   |  |  |
| .0390   | 1409.  | 481.   | -1083. | -861.    | 401.    | -1503.   | -.0236 | .0156  | -.0042 | .0072  | -.0752 | .0086  | 713.   |  |  |
| .0400   | 1011.  | 19.    | -1418. | -1252.   | 826.    | -1169.   | -.0265 | .0150  | -.0098 | -.0035 | -.0878 | .0035  | 763.   |  |  |
| .0410   | 890.   | 66.    | -1680. | -1467.   | 1108.   | -991.    | -.0266 | .0146  | -.0131 | -.0079 | -.0730 | .0108  | 838.   |  |  |
| .0420   | 860.   | 485.   | -1727. | -1378.   | 1129.   | -835.    | -.0254 | .0144  | -.0144 | -.0090 | -.0918 | .0259  | 790.   |  |  |
| .0430   | 735.   | 609.   | -1300. | -933.    | 932.    | -616.    | -.0242 | .0134  | -.0134 | -.0117 | -.0954 | .0295  | 584.   |  |  |
| .0440   | 758.   | 501.   | -442.  | -139.    | 519.    | -573.    | -.0243 | .0114  | -.0111 | -.0173 | -.1017 | .0224  | 315.   |  |  |
| .0450   | 973.   | 466.   | 310.   | 630.     | 14.     | -783.    | -.0258 | .0091  | -.0099 | -.0191 | -.1002 | .0162  | 403.   |  |  |
| .0460   | 1095.  | 454.   | 703.   | 1084.    | -354.   | -953.    | -.0273 | .0069  | -.0101 | -.0152 | -.0948 | .0130  | 596.   |  |  |
| .0470   | 968.   | 405.   | 943.   | 1303.    | -453.   | -801.    | -.0275 | .0042  | -.0105 | -.0118 | -.0962 | .0094  | 640.   |  |  |
| .0480   | 681.   | 482.   | 958.   | 1269.    | -315.   | -388.    | -.0265 | .0015  | -.0107 | -.0102 | -.0971 | .0083  | 547.   |  |  |
| .0490   | 325.   | 629.   | 475.   | 803.     | -16.    | 40.      | -.0249 | -.0006 | -.0109 | -.0059 | -.0829 | .0122  | 323.   |  |  |
| .0500   | -3.    | 577.   | -223.  | 103.     | 334.    | 324.     | -.0235 | -.0023 | -.0103 | -.0005 | -.0580 | .0153  | 191.   |  |  |
| .0510   | -199.  | 452.   | -653.  | -399.    | 575.    | 493.     | -.0227 | -.0040 | -.0079 | .0040  | -.0329 | .0128  | 343.   |  |  |
| .0520   | -278.  | 454.   | -755.  | -586.    | 581.    | 608.     | -.0227 | -.0060 | -.0039 | .0092  | -.0091 | .0076  | 411.   |  |  |
| .0530   | -241.  | 470.   | -637.  | -550.    | 338.    | 580.     | -.0231 | -.0079 | .0011  | .0160  | .0143  | .0037  | 348.   |  |  |
| .0540   | 36.    | 420.   | -249.  | -259.    | -95.    | 271.     | -.0235 | -.0093 | .0069  | .0226  | .0348  | .0011  | 155.   |  |  |
| .0550   | 498.   | 349.   | 326.   | 212.     | -600.   | -230.    | -.0234 | -.0101 | .0130  | .0268  | .0518  | -.0014 | 271.   |  |  |
| .0560   | 815.   | 210.   | 773.   | 562.     | -1024.  | -612.    | -.0228 | -.0104 | .0183  | .0290  | .0675  | -.0045 | 529.   |  |  |
| .0570   | 789.   | 72.    | 943.   | 646.     | -1243.  | -649.    | -.0216 | -.0103 | .0220  | .0327  | .0833  | -.0092 | 620.   |  |  |
| .0580   | 498.   | 76.    | 884.   | 531.     | -1202.  | -365.    | -.0193 | -.0093 | .0239  | .0392  | .0990  | -.0163 | 547.   |  |  |
| .0590   | 15.    | 36.    | 580.   | 180.     | -912.   | 102.     | -.0156 | -.0075 | .0247  | .0455  | .1137  | -.0261 | 375.   |  |  |
| .0600   | -604.  | -249.  | 64.    | -403.    | -486.   | 617.     | -.0098 | -.0055 | .0251  | .0499  | .1276  | -.0356 | 354.   |  |  |
| .0610   | -1188. | -558.  | -346.  | -890.    | -117.   | 1089.    | -.0020 | -.0029 | .0257  | .0541  | .1388  | -.0402 | 566.   |  |  |
| .0620   | -1608. | -590.  | -380.  | -964.    | 58.     | 1486.    | .0068  | .0005  | .0268  | .0594  | .1445  | -.0386 | 711.   |  |  |
| .0630   | -1870. | -529.  | -64.   | -675.    | 9.      | 1751.    | .0154  | .0043  | .0283  | .0640  | .1420  | -.0349 | 753.   |  |  |
| .0640   | -1931. | -648.  | 499.   | -168.    | -253.   | 1753.    | .0222  | .0076  | .0299  | .0658  | .1325  | -.0332 | 714.   |  |  |
| .0650   | -1746. | -865.  | 1246.  | 519.     | -670.   | 1469.    | .0261  | .0104  | .0307  | .0639  | .1201  | -.0342 | 680.   |  |  |
| .0660   | -1505. | -1026. | 1956.  | 1215.    | -1077.  | 1122.    | .0271  | .0172  | .0293  | .0597  | .1082  | -.0365 | 792.   |  |  |
| .0670   | -1413. | -1120. | 2333.  | 1614.    | -1293.  | 946.     | .0261  | .0160  | .0251  | .0561  | .0970  | -.0380 | 912.   |  |  |
| .0680   | -1418. | -1053. | 2234.  | 1565.    | -1237.  | 945.     | .0240  | .0185  | .0180  | .0569  | .0878  | -.0352 | 886.   |  |  |
| .0690   | -1446. | -816.  | 1681.  | 1104.    | -904.   | 1031.    | .0214  | .0206  | .0090  | .0616  | .0826  | -.0280 | 707.   |  |  |
| .0700   | -1574. | -702.  | 811.   | 330.     | -349.   | 1173.    | .0184  | .0215  | .0000  | .0642  | .0790  | -.0217 | 509.   |  |  |
| .0710   | -1713. | -765.  | -99.   | -519.    | 234.    | 1290.    | .0148  | .0209  | -.0074 | .0625  | .0750  | -.0185 | 566.   |  |  |
| .0720   | -1588. | -640.  | -758.  | -1103.   | 590.    | 1228.    | .0105  | .0192  | -.0128 | .0605  | .0720  | -.0149 | 703.   |  |  |
| .0730   | -1160. | -284.  | -1031. | -1262.   | 630.    | 934.     | .0054  | .0167  | -.0160 | .0590  | .0675  | -.0107 | 679.   |  |  |
| .0740   | -603.  | -84.   | -911.  | -1056.   | 440.    | 461.     | .0001  | .0131  | -.0172 | .0545  | .0536  | -.0105 | 495.   |  |  |
| .0750   | 54.    | -78.   | -490.  | -592.    | 109.    | -153.    | -.0046 | .0086  | -.0173 | .0474  | .0288  | -.0141 | 249.   |  |  |

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18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK

2 SAFETY COLD FKW24F--2 PSV

CONDITION 24

LOADS

SHOCK

PRESSURE

ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING



|       |        |        |        |        |        |       |        |       |        |       |       |        |      |
|-------|--------|--------|--------|--------|--------|-------|--------|-------|--------|-------|-------|--------|------|
| .0650 | -1746. | -865.  | 1246.  | 519.   | -670.  | 1469. | .0261  | .0104 | .0307  | .0639 | .1201 | -.0342 | 680. |
| .0660 | -1505. | -1026. | 1956.  | 1215.  | -1077. | 1122. | .0271  | .0132 | .0293  | .0597 | .1082 | -.0365 | 792. |
| .0670 | -1413. | -1120. | 2333.  | 1614.  | -1293. | 946.  | .0261  | .0160 | .0251  | .0561 | .0970 | -.0380 | 912. |
| .0680 | -1418. | -1053. | 2234.  | 1565.  | -1237. | 945.  | .0240  | .0185 | .0180  | .0569 | .0878 | -.0352 | 886. |
| .0690 | -1446. | -816.  | 1631.  | 1104.  | -904.  | 1031. | .0214  | .0206 | .0090  | .0616 | .0826 | -.0280 | 707. |
| .0700 | -1574. | -702.  | 811.   | 330.   | -349.  | 1173. | .0184  | .0215 | .0000  | .0642 | .0790 | -.0217 | 509. |
| .0710 | -1713. | -765.  | -99.   | -519.  | 234.   | 1290. | .0148  | .0209 | -.0074 | .0625 | .0750 | -.0185 | 566. |
| .0720 | -1588. | -640.  | -758.  | -1103. | 590.   | 1228. | .0105  | .0192 | -.0128 | .0605 | .0720 | -.0149 | 703. |
| .0730 | -1160. | -284.  | -1031. | -1262. | 630.   | 934.  | .0054  | .0167 | -.0160 | .0590 | .0675 | -.0107 | 679. |
| .0740 | -603.  | -84.   | -911.  | -1056. | 440.   | 461.  | .0001  | .0131 | -.0172 | .0545 | .0536 | -.0105 | 495. |
| .0750 | 54.    | -78.   | -490.  | -592.  | 109.   | -153. | -.0046 | .0086 | -.0173 | .0474 | .0288 | -.0141 | 249. |

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DIS/ADLPIPE

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83/12/02. 18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING

| SECTION | 50     | MEMBER | 1      | SEQUENCE | 70      | LOCATION | END    | TYPE   | RU     |        |        |        |        |  |  |
|---------|--------|--------|--------|----------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--|--|
| TIME    | FX     | FY     | FZ     | MX       | MY      | MZ       | DX     | DY     | DZ     | RX     | RY     | RZ     | STRESS |  |  |
| (SEC)   | (LB)   | (LB)   | (LB)   | (FT-LB)  | (FT-LB) | (FT-LB)  | (IN)   | (IN)   | (IN)   | (DEG)  | (DEG)  | (DEG)  | (PSI)  |  |  |
| .0760   | 807.   | 30.    | 12.    | -29.     | -272.   | -815.    | -.0085 | .0037  | -.0179 | .0426  | .0002  | -.0160 | 345.   |  |  |
| .0770   | 1417.  | 246.   | 329.   | 383.     | -537.   | -1308.   | -.0112 | -.0008 | -.0197 | .0415  | -.0265 | -.0148 | 588.   |  |  |
| .0780   | 1697.  | 404.   | 336.   | 479.     | -546.   | -1489.   | -.0127 | -.0050 | -.0227 | .0418  | -.0488 | -.0130 | 665.   |  |  |
| .0790   | 1745.  | 566.   | 22.    | 249.     | -306.   | -1428.   | -.0134 | -.0087 | -.0260 | .0425  | -.0627 | -.0119 | 595.   |  |  |
| .0800   | 1663.  | 757.   | -585.  | -263.    | 98.     | -1238.   | -.0139 | -.0121 | -.0290 | .0426  | -.0550 | -.0109 | 509.   |  |  |
| .0810   | 1410.  | 773.   | -1304. | -915.    | 571.    | -954.    | -.0141 | -.0152 | -.0306 | .0394  | -.0500 | -.0117 | 578.   |  |  |
| .0820   | 1093.  | 660.   | -1822. | -1414.   | 962.    | -654.    | -.0137 | -.0177 | -.0307 | .0337  | -.0537 | -.0131 | 735.   |  |  |
| .0830   | 937.   | 709.   | -1971. | -1537.   | 1108.   | -477.    | -.0128 | -.0188 | -.0297 | .0301  | -.0474 | -.0113 | 784.   |  |  |
| .0840   | 963.   | 859.   | -1793. | -1314.   | 984.    | -474.    | -.0113 | -.0187 | -.0279 | .0291  | -.0437 | -.0068 | 686.   |  |  |
| .0850   | 1022.  | 799.   | -1339. | -861.    | 705.    | -583.    | -.0089 | -.0179 | -.0252 | .0279  | -.0477 | -.0047 | 504.   |  |  |
| .0860   | 1052.  | 577.   | -693.  | -262.    | 392.    | -712.    | -.0055 | -.0163 | -.0216 | .0271  | -.0587 | -.0064 | 343.   |  |  |
| .0870   | 1020.  | 451.   | -100.  | 293.     | 143.    | -754.    | -.0009 | -.0138 | -.0171 | .0290  | -.0691 | -.0088 | 330.   |  |  |
| .0880   | 818.   | 388.   | 211.   | 575.     | 58.     | -609.    | .0048  | -.0104 | -.0117 | .0323  | -.0748 | -.0101 | 337.   |  |  |
| .0890   | 428.   | 247.   | 247.   | 549.     | 189.    | -286.    | .0117  | -.0066 | -.0047 | .0337  | -.0766 | -.0110 | 260.   |  |  |
| .0900   | -5.    | 83.    | 113.   | 331.     | 472.    | 78.      | .0190  | -.0024 | .0034  | .0323  | -.0746 | -.0101 | 233.   |  |  |
| .0910   | -355.  | -35.   | -127.  | 22.      | 773.    | 355.     | .0251  | .0019  | .0118  | .0288  | -.0583 | -.0060 | 341.   |  |  |
| .0920   | -565.  | -135.  | -325.  | -233.    | 948.    | 485.     | .0287  | .0062  | .0190  | .0237  | -.0600 | -.0004 | 437.   |  |  |
| .0930   | -587.  | -205.  | -265.  | -226.    | 901.    | 435.     | .0283  | .0103  | .0238  | .0174  | -.0536 | .0031  | 412.   |  |  |
| .0940   | -428.  | -248.  | 69.    | 75.      | 631.    | 199.     | .0238  | .0142  | .0253  | .0112  | -.0477 | .0034  | 267.   |  |  |
| .0950   | -172.  | -343.  | 475.   | 469.     | 234.    | -176.    | .0162  | .0178  | .0234  | .0049  | -.0413 | .0018  | 222.   |  |  |
| .0960   | 100.   | -479.  | 784.   | 776.     | -146.   | -582.    | .0072  | .0212  | .0185  | -.0018 | -.0341 | .0008  | 394.   |  |  |
| .0970   | 302.   | -538.  | 922.   | 920.     | -385.   | -875.    | -.0013 | .0248  | .0118  | -.0090 | -.0257 | .0030  | 533.   |  |  |
| .0980   | 312.   | -527.  | 616.   | 828.     | -409.   | -940.    | -.0082 | .0286  | .0039  | -.0176 | -.0149 | .0089  | 529.   |  |  |
| .0990   | 104.   | -541.  | 467.   | 490.     | -243.   | -787.    | -.0130 | .0325  | -.0044 | -.0286 | -.0012 | .0166  | 385.   |  |  |
| .1000   | -200.  | -590.  | 44.    | 71.      | 1.      | -533.    | -.0163 | .0365  | -.0130 | -.0415 | .0136  | .0232  | 216.   |  |  |
| .1010   | -513.  | -648.  | -256.  | -224.    | 199.    | -265.    | -.0186 | .0406  | -.0223 | -.0540 | .0265  | .0263  | 160.   |  |  |
| .1020   | -838.  | -723.  | -339.  | -291.    | 277.    | 9.       | -.0199 | .0445  | -.0324 | -.0638 | .0338  | .0248  | 161.   |  |  |
| .1030   | -1130. | -786.  | -174.  | -105.    | 209.    | 268.     | -.0200 | .0480  | -.0429 | -.0689 | .0326  | .0195  | 143.   |  |  |
| .1040   | -1306. | -794.  | 200.   | 284.     | 26.     | 463.     | -.0181 | .0504  | -.0528 | -.0683 | .0231  | .0130  | 218.   |  |  |
| .1050   | -1397. | -795.  | 621.   | 709.     | -169.   | 599.     | -.0137 | .0515  | -.0604 | -.0632 | .0089  | .0068  | 379.   |  |  |
| .1060   | -1488. | -827.  | 915.   | 992.     | -275.   | 741.     | -.0068 | .0511  | -.0642 | -.0565 | -.0053 | .0011  | 509.   |  |  |
| .1070   | -1570. | -791.  | 1032.  | 1091.    | -270.   | 924.     | .0018  | .0491  | -.0632 | -.0503 | -.0153 | -.0039 | 584.   |  |  |
| .1080   | -1609. | -747.  | 1010.  | 1011.    | -174.   | 1115.    | .0109  | .0453  | -.0577 | -.0461 | -.0206 | -.0090 | 608.   |  |  |
| .1090   | -1568. | -787.  | 861.   | 762.     | -30.    | 1219.    | .0192  | .0404  | -.0491 | -.0424 | -.0211 | -.0139 | 577.   |  |  |
| .1100   | -1339. | -359.  | 545.   | 507.     | 32.     | 1210.    | .0246  | .0357  | -.0400 | -.0363 | -.0080 | -.0157 | 527.   |  |  |
| .1110   | -964.  | 31.    | 338.   | 357.     | -18.    | 1061.    | .0269  | .0299  | -.0318 | -.0323 | .0055  | -.0195 | 449.   |  |  |
| .1120   | -533.  | -3.    | 317.   | 285.     | -150.   | 761.     | .0266  | .0220  | -.0256 | -.0311 | .0110  | -.0258 | 332.   |  |  |
| .1130   | -74.   | -31.   | 222.   | 194.     | -302.   | 374.     | .0242  | .0144  | -.0227 | -.0251 | .0156  | -.0288 | 208.   |  |  |

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DIS/ADLPIPE

ADLPIPE STRESS ANALYSIS

83/12/02. 18.29.03.

S/RV PIPING KEWAUNEE GKW08F 2 RUP DISK  
2 SAFETY COLD FKW24F--2 PSV

CONDITION 24  
LOADS  
SHOCK  
PRESSURE  
ENGLISH UNITS

INTERNAL FORCES IN THE PIPING  
FORCES AND MOMENTS ACT ON THE PIPING