

Early Pool Fire Report

Workspace: 72438-1RiempFSRU-1R

Study: Riempimento FSRU-ME4-Water

Equipment Item: 1R Manichette GNL riempimento FSRU

72438-1RiempFSRU-1R\Riempimento FSRU-ME4-Water\1R Manichette GNL riempimento FSRU

| Material | GAS NATURALE | |
|----------|--------------|---|
| East | 0 | m |
| North | 0 | m |

Scenario (Leak) : 300mm

72438-1RiempFSRU-1R\Riempimento FSRU-ME4-Water\1R Manichette GNL riempimento FSRU\300mm

Weather: Category 2/F

| | |
|--------------------------------|---|
| Wind speed [m/s] | 2 |
| Pasquill stability | F stable - night with moderate clouds and light/moderate wind |
| Atmospheric temperature [degC] | 25 |
| Relative humidity [fraction] | 0,75 |
| Solar radiation flux [kW/m2] | 0,5 |

Pool fire model results

Early pool fires are assumed to occur at a time when the initial PVAP rainout rate equals the pool fire burn rate, unless the thus calculated pool fire radius exceeds the maximum PVAP pool radius. For the latter case the early pool fire radius is assumed to be the maximum PVAP pool radius. The pool fire centre is located at the rainout point.

INPUT DATA

Correlation Type: Thomas / Johnson

| | |
|-------------------------------------|-------|
| Surface type | Water |
| Pool fire elevation | 0 m |
| Maximum exposure duration | 20 s |
| Downwind distance of liquid rainout | 0 m |



| | |
|------------------------------|----|
| Use two zone pool fire model | No |
|------------------------------|----|

OUTPUT DATA

| | | |
|---|----------|----------|
| Pool fire diameter | 69,2537 | m |
| Downwind distance of pool fire centre | 0 | m |
| Pool fire flame length | 151,886 | m |
| Angle between pool fire axis and vertical | 22,3491 | deg |
| Flame emissive power | 214,335 | kW/m2 |
| Total burn rate | 910,991 | kg/s |
| Radiative fraction | 0,174358 | fraction |

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

| | |
|--------------------|----------|
| Observer direction | Variable |
| Exposure duration | 20 s |
| Height of interest | 1,7 m |

OUTPUT DATA

Radiation intensity

| Incident radiation [kW/m2] | Lethality [%] | View factor | Probability | Dose [(W/m2)^ProbN.s] | Hazard information | Ellipse half-length [m] | Ellipse half-width [m] | Ellipse centre downwind distance [m] | Effect downwind distance [m] | Ellipse area [m2] |
|----------------------------|---------------|-------------|-------------|-----------------------|--------------------|-------------------------|------------------------|--------------------------------------|------------------------------|-------------------|
| 3 | 0 | 0,0139968 | -1,38321 | 865.119 | - | 352,122 | 356,043 | 41,0128 | 393,135 | 393863 |
| 5 | 0,00017 | 0,023 | 0,360 | 1.709.491 | - | 274, | 276, | 41,259 | 316,10 | 2383 |



| | | | | | | | | | | |
|------|---------|-------|-------|------------|---|------|------|--------|--------|------|
| | 4704 | 3279 | 367 | | | 845 | 053 | 6 | 5 | 58 |
| 7 | 0,02405 | 0,032 | 1,508 | 2.677.313 | - | 231, | 231, | 40,782 | 272,61 | 1685 |
| | | 6591 | 83 | | | 835 | 415 | 4 | 7 | 47 |
| 12,5 | 6,52536 | 0,058 | 3,487 | 5.800.162 | - | 169, | 166, | 38,114 | 207,48 | 8849 |
| | | 3199 | 89 | | | 374 | 304 | 3 | 8 | 0,9 |
| 37,5 | 98,7381 | 0,174 | 7,237 | 25.094.924 | - | 82,1 | 77,6 | 22,528 | 104,72 | 2004 |
| | | 96 | 73 | | | 987 | 41 | 9 | 8 | 9,6 |

Radiation v Distance Results

INPUT DATA

| | | |
|---------------------------|------------|-----|
| Maximum distance | 393,135 | m |
| Angle from wind direction | 0 | deg |
| Observer direction | Variable | |
| Height of interest | 1,7 | m |

OUTPUT DATA

| Downwind distance [m] | Maximum incident radiation [kW/m2] | Lethality level [fraction] |
|-----------------------|------------------------------------|----------------------------|
| 0 | 214,335 | 1 |
| 8,02316 | 214,335 | 1 |
| 16,0463 | 214,335 | 1 |
| 24,0695 | 214,335 | 1 |
| 32,0926 | 214,335 | 1 |
| 40,1158 | 131,223 | 1 |
| 48,139 | 95,513 | 1 |
| 56,1621 | 78,1593 | 0,999999 |
| 64,1853 | 66,5531 | 0,999986 |
| 72,2084 | 57,9702 | 0,999902 |
| 80,2316 | 51,3493 | 0,999534 |
| 88,2548 | 46,0207 | 0,998341 |
| 96,2779 | 41,6178 | 0,995248 |
| 104,301 | 37,6946 | 0,987946 |
| 112,324 | 34,2436 | 0,973052 |
| 120,347 | 31,1908 | 0,946186 |
| 128,371 | 28,4726 | 0,902808 |



| | | |
|---------|---------|-------------|
| 136,394 | 26,0385 | 0,839573 |
| 144,417 | 23,8495 | 0,755836 |
| 152,44 | 21,8744 | 0,654652 |
| 160,463 | 20,0883 | 0,542671 |
| 168,486 | 18,4705 | 0,428804 |
| 176,51 | 17,0035 | 0,322085 |
| 184,533 | 15,6723 | 0,229608 |
| 192,556 | 14,4636 | 0,155267 |
| 200,579 | 13,3653 | 0,0996352 |
| 208,602 | 12,367 | 0,0607377 |
| 216,625 | 11,4589 | 0,0352317 |
| 224,648 | 10,6323 | 0,0194866 |
| 232,672 | 9,87932 | 0,0103012 |
| 240,695 | 9,19274 | 0,00521788 |
| 248,718 | 8,56609 | 0,00253918 |
| 256,741 | 7,99356 | 0,00119027 |
| 264,764 | 7,46986 | 0,000538892 |
| 272,787 | 6,99026 | 0,000236256 |
| 280,811 | 6,55049 | 0,000100548 |
| 288,834 | 6,14673 | 4,16405E-05 |
| 296,857 | 5,77554 | 1,68188E-05 |
| 304,88 | 5,43384 | 6,63965E-06 |
| 312,903 | 5,11887 | 2,56711E-06 |
| 320,926 | 4,82814 | 9,73896E-07 |
| 328,95 | 4,55943 | 3,63177E-07 |
| 336,973 | 4,31073 | 1,33345E-07 |
| 344,996 | 4,08025 | 4,8278E-08 |
| 353,019 | 3,86638 | 1,72605E-08 |
| 361,042 | 3,66766 | 0 |
| 369,065 | 3,48278 | 0 |
| 377,088 | 3,31057 | 0 |
| 385,112 | 3,14996 | 0 |
| 393,135 | 3 | 0 |

Weather: Category 5/D

| | |
|--------------------------------|--|
| Wind speed [m/s] | 5 |
| Pasquill stability | D neutral - little sun and high wind or overcast/windy night |
| Atmospheric temperature [degC] | 25 |
| Relative humidity [fraction] | 0,75 |
| Solar radiation flux [kW/m2] | 0,5 |

Pool fire model results

Early pool fires are assumed to occur at a time when the initial PVAP rainout rate equals the pool fire burn rate, unless the thus calculated pool fire radius exceeds the maximum PVAP pool radius. For the latter case the early pool fire radius is assumed to be the maximum PVAP pool radius. The pool fire centre is located at the rainout point.

INPUT DATA

Correlation Type: Thomas / Johnson

| | | |
|-------------------------------------|-------|---|
| Surface type | Water | |
| Pool fire elevation | 0 | m |
| Maximum exposure duration | 20 | s |
| Downwind distance of liquid rainout | 0 | m |
| Use two zone pool fire model | No | |

OUTPUT DATA

| | | |
|---|----------|----------|
| Pool fire diameter | 69,2537 | m |
| Downwind distance of pool fire centre | 0 | m |
| Pool fire flame length | 151,886 | m |
| Angle between pool fire axis and vertical | 39,6478 | deg |
| Flame emissive power | 214,335 | kW/m2 |
| Total burn rate | 910,991 | kg/s |
| Radiative fraction | 0,174358 | fraction |

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

| | | |
|--------------------|------------|---|
| Observer direction | Variable | |
| Exposure duration | 20 | s |
| Height of interest | 1,7 | m |

OUTPUT DATA

Radiation intensity

| Incident radiation [kW/m ²] | Lethality [%] | View factor | Probability | Dose [(W/m ²) ^{Pr} obitN.s] | Hazard information | Ellipse half-length [m] | Ellipse half-width [m] | Ellipse centre downwind distance [m] | Effect downwind distance [m] | Ellipse area [m ²] |
|---|-----------------|---------------|------------------|--|--------------------|-------------------------|------------------------|--------------------------------------|------------------------------|--------------------------------|
| 3 | 0 | 0,013 9968 | - 1,383 21 | 865.119 | - | 339, 825 | 353, 018 | 67,621 2 | 407,44 7 | 3768 80 |
| 5 | 0,00017 4704 | 0,023 3279 | 0,360 367 | 1.709.491 | - | 266, 952 | 276, 223 | 65,976 2 | 332,92 8 | 2316 56 |
| 7 | 0,02405 | 0,032 6591 | 1,508 83 | 2.677.313 | - | 226, 675 | 233, 541 | 64,107 9 | 290,78 3 | 1663 09 |
| 12,5 | 6,52536 | 0,058 3199 | 3,487 89 | 5.800.162 | - | 171, 239 | 171, 561 | 61,247 2 | 232,48 6 | 9229 3,6 |
| 37,5 | 98,7381 | 0,174 96 | 7,237 73 | 25.094.924 | - | 93,5 476 | 84,6 374 | 41,995 7 | 135,54 3 | 2487 3,9 |

Radiation v Distance Results

INPUT DATA

| | | |
|---------------------------|------------|-----|
| Maximum distance | 407,447 | m |
| Angle from wind direction | 0 | deg |
| Observer direction | Variable | |
| Height of interest | 1,7 | m |

OUTPUT DATA

| Downwind distance [m] | Maximum incident radiation [kW/m ²] | Lethality level [fraction] |
|-----------------------|---|----------------------------|
| 0 | 214,335 | 1 |
| 8,31524 | 214,335 | 1 |
| 16,6305 | 214,335 | 1 |
| 24,9457 | 214,335 | 1 |
| 33,2609 | 214,335 | 1 |
| 41,5762 | 133,801 | 1 |
| 49,8914 | 105,44 | 1 |
| 58,2067 | 89,5034 | 1 |
| 66,5219 | 77,9943 | 0,999999 |
| 74,8371 | 69,433 | 0,999993 |
| 83,1524 | 62,3391 | 0,999964 |
| 91,4676 | 56,511 | 0,999862 |
| 99,7828 | 51,853 | 0,999587 |
| 108,098 | 47,7828 | 0,998911 |
| 116,413 | 44,2812 | 0,997485 |
| 124,729 | 40,9755 | 0,994461 |
| 133,044 | 38,3815 | 0,989749 |
| 141,359 | 35,3894 | 0,979325 |
| 149,674 | 32,4093 | 0,959049 |
| 157,989 | 29,5683 | 0,923154 |
| 166,305 | 26,9074 | 0,865363 |
| 174,62 | 24,4431 | 0,781385 |
| 182,935 | 22,1802 | 0,671947 |
| 191,25 | 20,1167 | 0,544585 |
| 199,566 | 18,2456 | 0,412453 |
| 207,881 | 16,5565 | 0,290196 |
| 216,196 | 15,0371 | 0,189058 |
| 224,511 | 13,6737 | 0,113951 |
| 232,827 | 12,4524 | 0,0636131 |
| 241,142 | 11,3593 | 0,0329784 |
| 249,457 | 10,3813 | 0,015936 |
| 257,772 | 9,50605 | 0,00720951 |
| 266,088 | 8,72216 | 0,00306825 |



| | | |
|---------|---------|-------------|
| 274,403 | 8,05734 | 0,00130195 |
| 282,718 | 7,49695 | 0,000562908 |
| 291,033 | 6,98525 | 0,000234102 |
| 299,349 | 6,51777 | 9,39614E-05 |
| 307,664 | 6,09036 | 3,6514E-05 |
| 315,979 | 5,69919 | 1,37801E-05 |
| 324,294 | 5,3408 | 5,06476E-06 |
| 332,609 | 5,01204 | 1,81775E-06 |
| 340,925 | 4,71006 | 6,38617E-07 |
| 349,24 | 4,4323 | 2,20123E-07 |
| 357,555 | 4,17647 | 7,45956E-08 |
| 365,87 | 3,94049 | 2,4901E-08 |
| 374,186 | 3,72253 | 8,20232E-09 |
| 382,501 | 3,52091 | 0 |
| 390,816 | 3,33415 | 0 |
| 399,131 | 3,16091 | 0 |
| 407,447 | 2,99999 | 0 |

Scenario (User defined source) : 300mm-Q254,5

72438-1RiempFSRU-1R\Riempimento FSRU-ME4-Water\1R Manichette GNL
riempimento FSRU\300mm-Q254,5

Weather: Category 2/F

| | |
|--------------------------------|---|
| Wind speed [m/s] | 2 |
| Pasquill stability | F stable - night with moderate clouds and light/moderate wind |
| Atmospheric temperature [degC] | 25 |
| Relative humidity [fraction] | 0,75 |
| Solar radiation flux [kW/m2] | 0,5 |

Pool fire model results

Early pool fires are assumed to occur at a time when the initial PVAP rainout rate equals the pool fire burn rate, unless the thus calculated pool fire radius exceeds the maximum PVAP pool radius. For the latter case the early pool fire radius is assumed to be the maximum PVAP pool radius. The pool fire centre is located at the rainout point.

INPUT DATA

Correlation Type: Thomas / Johnson

| | | |
|-------------------------------------|-------|---|
| Surface type | Water | |
| Pool fire elevation | 0 | m |
| Maximum exposure duration | 20 | s |
| Downwind distance of liquid rainout | 0 | m |
| Use two zone pool fire model | No | |

OUTPUT DATA

| | | |
|---|----------|----------|
| Pool fire diameter | 36,5958 | m |
| Downwind distance of pool fire centre | 0 | m |
| Pool fire flame length | 97,1467 | m |
| Angle between pool fire axis and vertical | 26,0759 | deg |
| Flame emissive power | 213,676 | kW/m2 |
| Total burn rate | 252,884 | kg/s |
| Radiative fraction | 0,207874 | fraction |

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

| | | |
|--------------------|------------|---|
| Observer direction | Variable | |
| Exposure duration | 20 | s |
| Height of interest | 1,7 | m |

OUTPUT DATA

Radiation intensity

| Incident radiation [kW/m ²] | Lethality [%] | View factor | Probability | Dose [(W/m ²) ^{Pr} obitN.s] | Hazard information | Ellipse half-length [m] | Ellipse half-width [m] | Ellipses centre downwind distance [m] | Effect downwind distance [m] | Ellipse area [m ²] |
|---|-----------------|---------------|------------------|--|--------------------|-------------------------|------------------------|---------------------------------------|------------------------------|--------------------------------|
| 3 | 0 | 0,014 0399 | - 1,383 21 | 865.119 | - | 209, 257 | 212, 743 | 29,436 1 | 238,69 3 | 1398 57 |
| 5 | 0,00017 4704 | 0,023 3999 | 0,360 367 | 1.709.491 | - | 162, 858 | 164, 162 | 29,523 | 192,38 2 | 8399 1,2 |
| 7 | 0,02405 7599 | 0,032 7599 | 1,508 83 | 2.677.313 | - | 137, 165 | 137, 101 | 29,110 2 | 166,27 5 | 5907 9 |
| 12,5 | 6,52536 4998 | 0,058 4998 | 3,487 89 | 5.800.162 | - | 100, 021 | 97,7 216 | 26,963 4 | 126,98 4 | 3070 6,5 |
| 37,5 | 98,7381 499 | 0,175 499 | 7,237 73 | 25.094.924 | - | 48,2 658 | 44,9 673 | 15,413 5 | 63,679 2 | 6818 ,45 |

Radiation v Distance Results

INPUT DATA

| | | |
|---------------------------|----------|-----|
| Maximum distance | 238,693 | m |
| Angle from wind direction | 0 | deg |
| Observer direction | Variable | |

Height of interest

1,7

m

OUTPUT DATA

| Downwind distance [m] | Maximum incident radiation [kW/m ²] | Lethality level [fraction] |
|-----------------------|---|----------------------------|
| 0 | 213,676 | 1 |
| 4,87129 | 213,676 | 1 |
| 9,74257 | 213,676 | 1 |
| 14,6139 | 213,676 | 1 |
| 19,4851 | 213,676 | 1 |
| 24,3564 | 119,61 | 1 |
| 29,2277 | 92,5975 | 1 |
| 34,099 | 76,6117 | 0,999999 |
| 38,9703 | 65,5631 | 0,999983 |
| 43,8416 | 57,3196 | 0,999886 |
| 48,7129 | 50,8663 | 0,999478 |
| 53,5841 | 45,6672 | 0,998194 |
| 58,4554 | 41,3751 | 0,994964 |
| 63,3267 | 37,7521 | 0,988108 |
| 68,198 | 34,4219 | 0,974136 |
| 73,0693 | 31,4352 | 0,949038 |
| 77,9406 | 28,7554 | 0,908482 |
| 82,8119 | 26,3424 | 0,849037 |
| 87,6832 | 24,1622 | 0,769569 |
| 92,5544 | 22,1868 | 0,672311 |
| 97,4257 | 20,3935 | 0,563021 |
| 102,297 | 18,7634 | 0,449982 |
| 107,168 | 17,2806 | 0,342115 |
| 112,04 | 15,9312 | 0,246916 |
| 116,911 | 14,7027 | 0,169001 |
| 121,782 | 13,5843 | 0,10969 |
| 126,653 | 12,5657 | 0,0675607 |
| 131,525 | 11,6379 | 0,0395426 |
| 136,396 | 10,7924 | 0,0220336 |



| | | |
|---------|---------|-------------|
| 141,267 | 10,0216 | 0,0117144 |
| 146,139 | 9,31848 | 0,00595711 |
| 151,01 | 8,67654 | 0,00290517 |
| 155,881 | 8,08999 | 0,00136237 |
| 160,752 | 7,55355 | 0,000615999 |
| 165,624 | 7,06243 | 0,000269269 |
| 170,495 | 6,61229 | 0,000114089 |
| 175,366 | 6,19924 | 4,69717E-05 |
| 180,238 | 5,81976 | 1,88368E-05 |
| 185,109 | 5,47067 | 7,37458E-06 |
| 189,98 | 5,14914 | 2,82461E-06 |
| 194,851 | 4,8526 | 1,06058E-06 |
| 199,723 | 4,57875 | 3,91116E-07 |
| 204,594 | 4,32553 | 1,41908E-07 |
| 209,465 | 4,09107 | 5,07404E-08 |
| 214,337 | 3,8737 | 1,79062E-08 |
| 219,208 | 3,67192 | 0 |
| 224,079 | 3,48438 | 0 |
| 228,95 | 3,30984 | 0 |
| 233,822 | 3,14721 | 0 |
| 238,693 | 2,99997 | 0 |

Weather: Category 5/D

| | |
|--------------------------------|--|
| Wind speed [m/s] | 5 |
| Pasquill stability | D neutral - little sun and high wind or overcast/windy night |
| Atmospheric temperature [degC] | 25 |
| Relative humidity [fraction] | 0,75 |
| Solar radiation flux [kW/m2] | 0,5 |

Pool fire model results

Early pool fires are assumed to occur at a time when the initial PVAP rainout rate equals the pool fire burn rate, unless the thus calculated pool fire radius exceeds the maximum PVAP pool radius. For the latter case the early pool fire radius is assumed to be the maximum PVAP pool radius. The pool fire centre is located at the rainout point.

INPUT DATA

Correlation Type: Thomas / Johnson

| | | |
|-------------------------------------|-------|---|
| Surface type | Water | |
| Pool fire elevation | 0 | m |
| Maximum exposure duration | 20 | s |
| Downwind distance of liquid rainout | 0 | m |
| Use two zone pool fire model | No | |

OUTPUT DATA

| | | |
|---|----------|----------|
| Pool fire diameter | 36,5958 | m |
| Downwind distance of pool fire centre | 0 | m |
| Pool fire flame length | 97,1467 | m |
| Angle between pool fire axis and vertical | 43,6601 | deg |
| Flame emissive power | 213,676 | kW/m2 |
| Total burn rate | 252,884 | kg/s |
| Radiative fraction | 0,207874 | fraction |

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

| | | |
|--------------------|------------|---|
| Observer direction | Variable | |
| Exposure duration | 20 | s |
| Height of interest | 1,7 | m |

OUTPUT DATA

Radiation intensity

| Incident radiation [kW/m ²] | Lethality [%] | View factor | Probability | Dose [(W/m ²) ^{Pr} obitN.s] | Hazard information | Ellipse half-length [m] | Ellipse half-width [m] | Ellipse centre downwind distance [m] | Effect downwind distance [m] | Ellipse area [m ²] |
|---|-----------------|---------------|------------------|--|--------------------|-------------------------|------------------------|--------------------------------------|------------------------------|--------------------------------|
| 3 | 0 | 0,014 0399 | - 1,383 21 | 865.119 | - | 201, 589 | 210, 471 | 46,116 8 | 247,70 5 | 1332 93 |
| 5 | 0,00017 4704 | 0,023 3999 | 0,360 367 | 1.709.491 | - | 158, 311 | 164, 04 | 44,865 4 | 203,17 6 | 8158 5 |
| 7 | 0,02405 7599 | 0,032 7599 | 1,508 83 | 2.677.313 | - | 134, 523 | 138, 289 | 43,492 5 | 178,01 5 | 5844 2,9 |
| 12,5 | 6,52536 4998 | 0,058 4998 | 3,487 89 | 5.800.162 | - | 101, 614 | 100, 943 | 40,751 7 | 142,36 5 | 3222 3,9 |
| 37,5 | 98,7381 499 | 0,175 499 | 7,237 73 | 25.094.924 | - | 55,9 095 | 49,0 379 | 27,304 6 | 83,214 1 | 8613 ,25 |

Radiation v Distance Results

INPUT DATA

| | | |
|---------------------------|------------|-----|
| Maximum distance | 247,705 | m |
| Angle from wind direction | 0 | deg |
| Observer direction | Variable | |
| Height of interest | 1,7 | m |

OUTPUT DATA

| Downwind distance [m] | Maximum incident radiation [kW/m ²] | Lethality level [fraction] |
|-----------------------|---|----------------------------|
| 0 | 213,676 | 1 |
| 5,05521 | 213,676 | 1 |
| 10,1104 | 213,676 | 1 |
| 15,1656 | 213,676 | 1 |
| 20,2208 | 213,676 | 1 |
| 25,2761 | 124,324 | 1 |
| 30,3313 | 103,391 | 1 |
| 35,3865 | 88,4756 | 1 |
| 40,4417 | 78,0426 | 0,999999 |
| 45,4969 | 68,8895 | 0,999992 |
| 50,5521 | 62,1423 | 0,999963 |
| 55,6073 | 56,4146 | 0,999859 |
| 60,6625 | 51,7282 | 0,999574 |
| 65,7177 | 47,8328 | 0,998924 |
| 70,773 | 44,189 | 0,997429 |
| 75,8282 | 41,2223 | 0,994778 |
| 80,8834 | 38,5227 | 0,990086 |
| 85,9386 | 36,1366 | 0,982628 |
| 90,9938 | 33,4081 | 0,967362 |
| 96,049 | 30,6066 | 0,938755 |
| 101,104 | 27,9061 | 0,890488 |
| 106,159 | 25,3623 | 0,816708 |
| 111,215 | 22,9998 | 0,715374 |
| 116,27 | 20,8285 | 0,591219 |
| 121,325 | 18,8493 | 0,456155 |
| 126,38 | 17,057 | 0,325936 |
| 131,435 | 15,4423 | 0,214588 |
| 136,491 | 13,9934 | 0,129892 |
| 141,546 | 12,6968 | 0,0723103 |
| 146,601 | 11,5386 | 0,0371076 |
| 151,656 | 10,505 | 0,0176196 |
| 156,712 | 9,58287 | 0,00777776 |
| 161,767 | 8,86668 | 0,00363402 |

| | | |
|---------|---------|-------------|
| 166,822 | 8,22567 | 0,00163878 |
| 171,877 | 7,64104 | 0,000706305 |
| 176,932 | 7,1079 | 0,000292026 |
| 181,988 | 6,62156 | 0,000116249 |
| 187,043 | 6,17765 | 4,47113E-05 |
| 192,098 | 5,7721 | 1,66702E-05 |
| 197,153 | 5,40122 | 6,04385E-06 |
| 202,208 | 5,06164 | 2,13695E-06 |
| 207,264 | 4,7503 | 7,38839E-07 |
| 212,319 | 4,46447 | 2,50411E-07 |
| 217,374 | 4,20169 | 8,33853E-08 |
| 222,429 | 3,95973 | 2,73377E-08 |
| 227,485 | 3,73664 | 8,84085E-09 |
| 232,54 | 3,53062 | 0 |
| 237,595 | 3,3401 | 0 |
| 242,65 | 3,16365 | 0 |
| 247,705 | 3 | 0 |

Scenario (Leak) : 60mm

72438-1RiempFSRU-1R\Riempimento FSRU-ME4-Water\1R Manichette GNL
riempimento FSRU\60mm

Weather: Category 2/F

| | |
|---------------------------------------|--|
| Wind speed [m/s] | 2 |
| Pasquill stability | F stable - night with moderate clouds and light/moderate wind |
| Atmospheric temperature [degC] | 25 |
| Relative humidity [fraction] | 0,75 |
| Solar radiation flux [kW/m2] | 0,5 |

Pool fire model results

Early pool fires are assumed to occur at a time when the initial PVAP rainout rate equals the pool fire burn rate, unless the thus calculated pool fire radius exceeds the maximum PVAP pool radius. For the latter case the early pool fire radius is assumed to be the maximum PVAP pool radius. The pool fire centre is located at the rainout point.

INPUT DATA

Correlation Type: Thomas / Johnson

| | | |
|-------------------------------------|-------|---|
| Surface type | Water | |
| Pool fire elevation | 0 | m |
| Maximum exposure duration | 20 | s |
| Downwind distance of liquid rainout | 0 | m |
| Use two zone pool fire model | No | |

OUTPUT DATA

| | | |
|---|----------|----------|
| Pool fire diameter | 13,8507 | m |
| Downwind distance of pool fire centre | 0 | m |
| Pool fire flame length | 45,1442 | m |
| Angle between pool fire axis and vertical | 32,1619 | deg |
| Flame emissive power | 190,282 | kW/m2 |
| Total burn rate | 31,1993 | kg/s |
| Radiative fraction | 0,259683 | fraction |

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

| | | |
|--------------------|------------|---|
| Observer direction | Variable | |
| Exposure duration | 20 | s |
| Height of interest | 1,7 | m |

OUTPUT DATA

Radiation intensity

| Incident radiation [kW/m ²] | Lethality [%] | View factor | Probability | Dose [(W/m ²) ^{Pr} obitN.s] | Hazard information | Ellipse half-length [m] | Ellipse half-width [m] | Ellips centre downwind distance [m] | Effect downwind distance [m] | Ellipse area [m ²] |
|---|---------------|-------------|-------------|--|--------------------|-------------------------|------------------------|-------------------------------------|------------------------------|--------------------------------|
| 3 | 0 | 0,0157661 | -1,38321 | 865.119 | - | 86,2069 | 88,149 | 16,0961 | 102,303 | 23863,9 |
| 5 | 0,000174704 | 0,0262768 | 0,360367 | 1.709.491 | - | 66,7322 | 67,6212 | 15,6284 | 82,3606 | 14176,5 |
| 7 | 0,024057875 | 0,0367875 | 1,50883 | 2.677.313 | - | 56,2965 | 56,2338 | 15,3414 | 71,6379 | 9945,55 |
| 12,5 | 6,52536692 | 0,065692 | 3,48789 | 5.800.162 | - | 41,3035 | 39,7272 | 14,0011 | 55,3046 | 5154,95 |
| 37,5 | 98,7381076 | 0,197076 | 7,23773 | 25.094.924 | - | 19,9214 | 18,2401 | 7,34354 | 27,2654 | 1141,56 |

Radiation v Distance Results

INPUT DATA

| | | |
|---------------------------|----------|-----|
| Maximum distance | 102,303 | m |
| Angle from wind direction | 0 | deg |
| Observer direction | Variable | |

Height of interest

1,7

m

OUTPUT DATA

| Downwind distance [m] | Maximum incident radiation [kW/m ²] | Lethality level [fraction] |
|-----------------------|---|----------------------------|
| 0 | 190,282 | 1 |
| 2,08782 | 190,282 | 1 |
| 4,17563 | 190,282 | 1 |
| 6,26345 | 190,282 | 1 |
| 8,35127 | 166,514 | 1 |
| 10,4391 | 117,813 | 1 |
| 12,5269 | 92,4517 | 1 |
| 14,6147 | 76,8119 | 0,999999 |
| 16,7025 | 65,3939 | 0,999982 |
| 18,7904 | 57,148 | 0,999881 |
| 20,8782 | 50,7535 | 0,999464 |
| 22,966 | 45,4142 | 0,998082 |
| 25,0538 | 41,2315 | 0,994789 |
| 27,1416 | 37,6963 | 0,987951 |
| 29,2294 | 34,5749 | 0,975033 |
| 31,3173 | 32,0306 | 0,9554 |
| 33,4051 | 29,5056 | 0,922105 |
| 35,4929 | 27,1452 | 0,871764 |
| 37,5807 | 24,9732 | 0,802371 |
| 39,6685 | 22,9804 | 0,714392 |
| 41,7563 | 21,1528 | 0,611571 |
| 43,8442 | 19,4772 | 0,500688 |
| 45,932 | 17,9414 | 0,390269 |
| 48,0198 | 16,5346 | 0,288648 |
| 50,1076 | 15,2468 | 0,202114 |
| 52,1954 | 14,069 | 0,133821 |
| 54,2832 | 12,9926 | 0,0837651 |
| 56,3711 | 12,0095 | 0,0496 |
| 58,4589 | 11,1121 | 0,0278205 |

| | | |
|---------|---------|-------------|
| 60,5467 | 10,2931 | 0,0148095 |
| 62,6345 | 9,5458 | 0,00749935 |
| 64,7223 | 8,86382 | 0,00362208 |
| 66,8101 | 8,24126 | 0,0016733 |
| 68,898 | 7,67266 | 0,000741559 |
| 70,9858 | 7,15301 | 0,000316202 |
| 73,0736 | 6,67771 | 0,000130109 |
| 75,1614 | 6,24258 | 5,18109E-05 |
| 77,2492 | 5,84381 | 2,00221E-05 |
| 79,337 | 5,47798 | 7,5287E-06 |
| 81,4249 | 5,14196 | 2,7615E-06 |
| 83,5127 | 4,83294 | 9,90398E-07 |
| 85,6005 | 4,54841 | 3,48077E-07 |
| 87,6883 | 4,28609 | 1,20126E-07 |
| 89,7761 | 4,05078 | 4,21151E-08 |
| 91,8639 | 3,84408 | 1,54252E-08 |
| 93,9518 | 3,65141 | 0 |
| 96,0396 | 3,47163 | 0 |
| 98,1274 | 3,30374 | 0 |
| 100,215 | 3,1468 | 0 |
| 102,303 | 2,99995 | 0 |

Weather: Category 5/D

| | |
|--------------------------------|--|
| Wind speed [m/s] | 5 |
| Pasquill stability | D neutral - little sun and high wind or overcast/windy night |
| Atmospheric temperature [degC] | 25 |
| Relative humidity [fraction] | 0,75 |
| Solar radiation flux [kW/m2] | 0,5 |

Pool fire model results

Early pool fires are assumed to occur at a time when the initial PVAP rainout rate equals the pool fire burn rate, unless the thus calculated pool fire radius exceeds the maximum PVAP pool radius. For the latter case the early pool fire radius is assumed to be the maximum PVAP pool radius. The pool fire centre is located at the rainout point.

INPUT DATA

Correlation Type: Thomas / Johnson

| | | |
|-------------------------------------|-------|---|
| Surface type | Water | |
| Pool fire elevation | 0 | m |
| Maximum exposure duration | 20 | s |
| Downwind distance of liquid rainout | 0 | m |
| Use two zone pool fire model | No | |

OUTPUT DATA

| | | |
|---|----------|----------|
| Pool fire diameter | 13,8507 | m |
| Downwind distance of pool fire centre | 0 | m |
| Pool fire flame length | 45,1442 | m |
| Angle between pool fire axis and vertical | 49,4554 | deg |
| Flame emissive power | 190,282 | kW/m2 |
| Total burn rate | 31,1993 | kg/s |
| Radiative fraction | 0,259683 | fraction |

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

| | | |
|--------------------|------------|---|
| Observer direction | Variable | |
| Exposure duration | 20 | s |
| Height of interest | 1,7 | m |

OUTPUT DATA

Radiation intensity

| Incident radiation [kW/m ²] | Lethality [%] | View factor | Probability | Dose [(W/m ²) ^{Pr} obitN.s] | Hazard information | Ellipse half-length [m] | Ellipse half-width [m] | Ellipse centre downwind distance [m] | Effect downwind distance [m] | Ellipse area [m ²] |
|---|---------------|-------------|-------------|--|--------------------|-------------------------|------------------------|--------------------------------------|------------------------------|--------------------------------|
| 3 | 0 | 0,0157661 | -1,38321 | 865.119 | - | 82,817 | 86,8335 | 22,7653 | 105,582 | 22592,1 |
| 5 | 0,000174704 | 0,0262768 | 0,360367 | 1.709.491 | - | 65,3168 | 67,3618 | 22,0355 | 87,3522 | 13822,6 |
| 7 | 0,024057875 | 0,0367875 | 1,50883 | 2.677.313 | - | 55,7935 | 56,589 | 21,2725 | 77,066 | 9918,95 |
| 12,5 | 6,52536 | 0,065692 | 3,48789 | 5.800.162 | - | 42,509 | 40,984 | 19,4315 | 61,9405 | 5473,24 |
| 37,5 | 98,7381 | 0,197076 | 7,23773 | 25.094.924 | - | 23,3868 | 19,706 | 12,0013 | 35,388 | 1447,83 |

Radiation v Distance Results

INPUT DATA

| | | |
|---------------------------|------------|-----|
| Maximum distance | 105,582 | m |
| Angle from wind direction | 0 | deg |
| Observer direction | Variable | |
| Height of interest | 1,7 | m |

OUTPUT DATA

| Downwind distance [m] | Maximum incident radiation [kW/m ²] | Lethality level [fraction] |
|-----------------------|---|----------------------------|
| 0 | 190,282 | 1 |
| 2,15474 | 190,282 | 1 |
| 4,30948 | 190,282 | 1 |
| 6,46423 | 190,282 | 1 |
| 8,61897 | 190,282 | 1 |
| 10,7737 | 125,577 | 1 |
| 12,9285 | 103,234 | 1 |
| 15,0832 | 88,5857 | 1 |
| 17,2379 | 74,5115 | 0,999998 |
| 19,3927 | 69,1601 | 0,999992 |
| 21,5474 | 62,0584 | 0,999962 |
| 23,7022 | 56,4657 | 0,999861 |
| 25,8569 | 51,6939 | 0,999571 |
| 28,0116 | 47,7209 | 0,998895 |
| 30,1664 | 44,2167 | 0,997446 |
| 32,3211 | 41,1917 | 0,99474 |
| 34,4759 | 38,5632 | 0,99018 |
| 36,6306 | 36,2358 | 0,983026 |
| 38,7854 | 34,1484 | 0,972455 |
| 40,9401 | 32,2513 | 0,957563 |
| 43,0948 | 30,0443 | 0,930713 |
| 45,2496 | 27,5475 | 0,881989 |
| 47,4043 | 25,0764 | 0,80626 |
| 49,5591 | 22,7205 | 0,701056 |
| 51,7138 | 20,5209 | 0,57138 |
| 53,8685 | 18,497 | 0,430729 |
| 56,0233 | 16,6554 | 0,297198 |
| 58,178 | 14,994 | 0,186419 |
| 60,3328 | 13,5047 | 0,105974 |
| 62,4875 | 12,1762 | 0,0546114 |
| 64,6423 | 10,9949 | 0,0255863 |
| 66,797 | 10,1244 | 0,0128228 |
| 68,9517 | 9,35009 | 0,00615527 |

| | | |
|---------|---------|-------------|
| 71,1065 | 8,6431 | 0,00279016 |
| 73,2612 | 7,99896 | 0,00119942 |
| 75,416 | 7,41278 | 0,00049111 |
| 77,5707 | 6,87961 | 0,000192375 |
| 79,7254 | 6,39461 | 7,2398E-05 |
| 81,8802 | 5,95323 | 2,62828E-05 |
| 84,0349 | 5,55122 | 9,23931E-06 |
| 86,1897 | 5,18467 | 3,15625E-06 |
| 88,3444 | 4,85004 | 1,05122E-06 |
| 90,4992 | 4,54414 | 3,42379E-07 |
| 92,6539 | 4,26409 | 1,09347E-07 |
| 94,8086 | 4,00731 | 3,43305E-08 |
| 96,9634 | 3,77149 | 1,06196E-08 |
| 99,1181 | 3,55459 | 0 |
| 101,273 | 3,35476 | 0 |
| 103,428 | 3,17037 | 0 |
| 105,582 | 2,99997 | 0 |

