Jet Fire

Workspace: 72438-2FSRURegas-8R

Study: FSRU in rigassificazione

Equipment Item: 8R Linee mandata pompe HP Booster

72438-2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe HP Booster

Material	**GAS NATURALE**	
East	0	m
North	0	m

Scenario (User defined source) : 200mm-59kg/s

72438-2FSRURegas-8R\FSRU in rigassificazione\8R Linee mandata pompe HP Booster\200mm-59kg/s

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

Jet fire model results

INPUT DATA

Scenario

Elevation	5	m
Release angle from horizontal	0	deg

Jet Fire Parameters

Jet fire method	Cone model	
Wind orientation about the z-axis (anti-clockwise from the East)	**0**	deg
Rotation about the z-axis (anti-clockwise from the east)	**0**	deg

Rate modification factor	3

Calculated inputs

Mass flow rate	59	kg/s
Temperature after atmospheric expansion	-160,343	degC
Liquid fraction	1	fraction
Velocity after atmospheric expansion (input)	**236,891**	m/s
Rainout fraction time averaged	**0**	fraction

OUTPUT DATA

Flame emissive power	137,136	kW/m2
Fraction of emissivity	0,207705	fraction
Jet velocity	236,891	m/s
Flame length	89,0873	m
Frustum length	87,751	m
Frustum base width	0,616053	m
Frustum tip width	26,9149	m
Frustum lift-off distance	1,33631	m
Flame length in still air	80,112	m
Hole to flame angle	0	deg
Expanded diameter	0,0263936	m
Plane angular rotation	0	deg

Flame on ground impingement with partial truncation

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	Probit	Dose [(W/m2)^ProbitN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m2]
3	0	0,0218762	-1,38321	865.119	83,0614	101,944	77,2157	160,277	26601,9
5	0,000174704	0,0364603	0,360367	1.709.491	73,0752	80,8803	70,2309	143,306	18567,9
7	0,02405	0,0510444	1,50883	2.677.313	67,6061	68,9887	66,3129	133,919	14652,6
12,5	6,52536	0,0911507	3,48789	5.800.162	59,3835	50,876	60,9099	120,293	9491,35
37,5	98,7381	0,273452	7,23773	25.094.924	46,8356	21,899	53,8753	100,711	3222,18

Radiation v Distance Results

INPUT DATA

Maximum distance	177,371	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	**1,7**	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m2]	Lethality level [fraction]
0	9,27274	0,00567929
3,61982	23,0818	0,719477
7,23965	38,3072	0,989568
10,8595	50,9397	0,999487
14,4793	61,7842	0,99996
18,0991	71,2187	0,999995

21,7189	79,559	0,999999
25,3388	87,0269	1
28,9586	93,8018	1
32,5784	100,523	1
36,1982	105,862	1
39,818	110,416	1
43,4379	116,754	1
47,0577	122,146	1
50,6775	128,191	1
54,2973	137,136	1
57,9172	137,136	1
61,537	137,136	1
65,1568	137,136	1
68,7766	137,136	1
72,3965	137,136	1
76,0163	137,136	1
79,6361	137,136	1
83,2559	137,136	1
86,8757	137,136	1
90,4956	123,487	1
94,1154	66,7982	0,999987
97,7352	46,9164	0,998661
101,355	35,597	0,980299
104,975	28,3027	0,899251
108,595	22,8128	0,705844
112,214	18,7377	0,448127
115,834	15,5366	0,220703
119,454	13,0075	0,0843715
123,074	10,9942	0,0255746
126,694	9,37747	0,00633103
130,314	8,06749	0,00132048
133,933	6,99592	0,000238715
137,553	6,11211	3,84228E-05
141,173	5,37654	5,62519E-06
144,793	4,7593	7,63107E-07

148,413	4,23747	9,74826E-08
152,033	3,79305	1,18786E-08
155,652	3,41201	0
159,272	3,08324	0
162,892	2,79789	0
166,512	2,54887	0
170,132	2,33044	0
173,751	2,1379	0
177,371	1,96744	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

Jet fire model results

INPUT DATA

Scenario

Elevation	5	m
Release angle from horizontal	0	deg

Jet Fire Parameters

Jet fire method	Cone model	
Wind orientation about the z-axis (anti-clockwise from the East)	**0**	deg
Rotation about the z-axis (anti-clockwise from the east)	**0**	deg
Rate modification factor	3	

Calculated inputs

Mass flow rate	59	kg/s
Temperature after atmospheric expansion	-160,343	degC
Liquid fraction	1	fraction
Velocity after atmospheric expansion (input)	**236,891**	m/s
Rainout fraction time averaged	**0**	fraction

OUTPUT DATA

Flame emissive power	188,469	kW/m2
Fraction of emissivity	0,207705	fraction

Jet velocity	236,891	m/s
Flame length	69,25	m
Frustum length	68,2112	m
Frustum base width	1,00263	m
Frustum tip width	24,2426	m
Frustum lift-off distance	1,03875	m
Flame length in still air	80,112	m
Hole to flame angle	0	deg
Expanded diameter	0,0263936	m
Plane angular rotation	0	deg

Flame on ground impingement with partial truncation

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	Probit	Dose [(W/m2)^ProbitN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m2]
3	0	0,0159177	-1,38321	865.119	79,0485	101,078	66,1205	145,169	25101,4
5	0,000174704	0,0265295	0,360367	1.709.491	67,0844	79,2438	60,4888	127,573	16700,8
7	0,02405	0,0371413	1,50883	2.677.313	61,1621	67,9631	56,7431	117,905	13058,9

12,5	6,52536	0,0663238	3,48789	5.800.162	52,8918	51,9416	51,1436	104,035	8630,85
37,5	98,7381	0,198971	7,23773	25.094.924	40,823	26,6096	43,5536	84,3766	3412,66

Radiation v Distance Results

INPUT DATA

Maximum distance	145,169	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	**1,7**	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m2]	Lethality level [fraction]
0	18,637	0,440863
2,96263	39,4473	0,992035
5,92526	59,8645	0,999937
8,8879	76,2769	0,999998
11,8505	90,4982	1
14,8132	103,066	1
17,7758	114,343	1
20,7384	124,539	1
23,7011	133,928	1
26,6637	142,685	1
29,6263	148,016	1
32,589	159,126	1
35,5516	166,776	1
38,5142	168,829	1
41,4768	188,469	1
44,4395	188,469	1
47,4021	188,469	1
50,3647	188,469	1
53,3274	188,469	1

56,29	188,469	1
59,2526	188,469	1
62,2153	188,469	1
65,1779	188,469	1
68,1405	188,469	1
71,1032	155,358	1
74,0658	92,2443	1
77,0284	66,6328	0,999987
79,9911	51,7543	0,999577
82,9537	41,4475	0,995051
85,9163	33,7866	0,970069
88,879	28,0841	0,894503
91,8416	23,5827	0,743628
94,8042	19,9645	0,534292
97,7669	17,0389	0,324634
100,729	14,6568	0,166322
103,692	12,703	0,0725417
106,655	11,0878	0,0273478
109,617	9,74192	0,00906394
112,58	8,61282	0,00268917
115,543	7,65827	0,000725338
118,505	6,84568	0,000180407
121,468	6,1496	4,19179E-05
124,431	5,54958	9,19756E-06
127,393	5,02936	1,92402E-06
130,356	4,5759	3,86876E-07
133,318	4,1786	7,53046E-08
136,281	3,82884	1,42755E-08
139,244	3,51955	0
142,206	3,24488	0
145,169	3	0