

Jet Fire

Workspace: 72341-1RiempimFSRU

Study: Riempimento FSRU-ME4

Equipment Item: 6R Linee ricircolo GNL durante riempimento FSRU

72341-1RiempimFSRU\Riempimento FSRU-ME4\6R Linee ricircolo GNL durante riempimento FSRU

Material	GAS NATURALE	
East	0	m
North	0	m

Scenario (User defined source) : 80mm-Q25,4

72341-1RiempimFSRU\Riempimento FSRU-ME4\6R Linee ricircolo GNL durante riempimento FSRU\80mm-Q25,4

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	12,5	m
Release angle from horizontal	0	deg

Jet Fire Parameters

Jet fire method	Cone model	
Crosswind angle	0	deg
Rate modification factor	3	

Calculated inputs

Mass flow rate	25,4	kg/s
Temperature after atmospheric expansion	-160,955	degC
Liquid fraction	1	fraction
Velocity after atmospheric expansion (input)	67,6572	m/s
Rainout fraction time averaged	0	fraction

OUTPUT DATA

Flame emissive power	86,4609	kW/m2
Fraction of emissivity	0,278776	fraction
Jet velocity	67,6572	m/s
Flame length	74,6273	m
Frustum length	73,5079	m
Frustum base width	1,54164	m
Frustum tip width	27,9075	m
Frustum lift-off distance	1,11941	m
Flame length in still air	67,1089	m
Hole to flame angle	0	deg
Expanded diameter	0,0330371	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/m ²]	Lethality [%]	View factor	Probit	Dose [(W/m ²) ^{Probit} N.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,0346978	-1,38321	865.119	72,5974	78,297	60,59	133,187	17857,3
5	0,000174704	0,0578296	0,360367	1.709.491	61,5103	61,3355	57,117	118,627	11852,5
7	0,02405	0,0809615	1,50883	2.677.313	54,8972	51,7263	55,5771	110,474	8920,97
12,5	6,52536	0,144574	3,48789	5.800.162	46,2277	37,4262	52,1948	98,4225	5435,35
37,5	98,7381	0,433722	7,23773	25.094.924	26,265	15,2919	54,6733	80,9383	1261,8

Radiation v Distance Results

INPUT DATA

Maximum distance	149,226	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/m ²]	Lethality level [fraction]
0	6,50882	9,22257E-05
3,04544	9,37661	0,00632543
6,09087	12,6355	0,0700644
9,13631	15,9924	0,251071
12,1817	19,3687	0,493079
15,2272	22,7542	0,702808
18,2726	26,1421	0,842853

21,3181	29,5409	0,922697
24,3635	33,7405	0,969751
27,4089	36,3729	0,983561
30,4544	39,9137	0,99287
33,4998	43,2802	0,996805
36,5452	46,7804	0,998616
39,5907	50,3254	0,999406
42,6361	53,9321	0,999747
45,6816	57,6896	0,999895
48,727	61,4287	0,999956
51,7724	65,4009	0,999982
54,8179	69,4139	0,999993
57,8633	74,3116	0,999998
60,9087	78,4031	0,999999
63,9542	86,4609	1
66,9996	86,4609	1
70,0451	86,4609	1
73,0905	86,4609	1
76,1359	69,4078	0,999993
79,1814	44,4172	0,997565
82,2268	33,6839	0,969356
85,2722	26,1177	0,842085
88,3177	22,2138	0,67381
91,3631	18,4924	0,430391
94,4086	15,5374	0,220755
97,454	13,1578	0,0906035
100,499	11,225	0,0301005
103,545	9,64398	0,00825404
106,59	8,34237	0,00191188
109,636	7,26385	0,000382937
112,681	6,36454	6,78389E-05
115,727	5,60972	1,08451E-05
118,772	4,97202	1,59215E-06
121,817	4,43018	2,18245E-07
124,863	3,96681	2,82873E-08



127,908	3,56834	0
130,954	3,22374	0
133,999	2,92416	0
137,045	2,66241	0
140,09	2,43264	0
143,136	2,23002	0
146,181	2,0506	0
149,226	1,89108	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	12,5	m
Release angle from horizontal	0	deg

Jet Fire Parameters

Jet fire method	Cone model	
Crosswind angle	0	deg
Rate modification factor	3	

Calculated inputs

Mass flow rate	25,4	kg/s
Temperature after atmospheric expansion	-160,955	degC
Liquid fraction	1	fraction
Velocity after atmospheric expansion (input)	67,6572	m/s
Rainout fraction time averaged	0	fraction

OUTPUT DATA

Flame emissive power	115,862	kW/m2
Fraction of emissivity	0,278776	fraction
Jet velocity	67,6572	m/s
Flame length	58,0099	m
Frustum length	57,1397	m

Frustum base width	2,31578	m
Frustum tip width	25,3046	m
Frustum lift-off distance	0,870148	m
Flame length in still air	67,1089	m
Hole to flame angle	0	deg
Expanded diameter	0,0330371	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/m ²]	Lethality [%]	View factor	Probability	Dose [(W/m ²)^ProbN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,0258929	-1,38321	865.119	70,5682	77,7806	50,0523	120,621	17243,7
5	0,000174704	0,0431548	0,360367	1.709.491	58,857	60,5918	46,8295	105,686	11203,7
7	0,02405	0,0604167	1,50883	2.677.313	51,9343	51,4695	45,4667	97,401	8397,59
12,5	6,52536	0,107887	3,48789	5.800.162	42,4124	38,4947	42,915	85,3273	5129,13
37,5	98,7381	0,323661	7,23773	25.094.924	26,2775	18,4801	40,9518	67,2293	1525,59

Radiation v Distance Results

INPUT DATA

Maximum distance	120,621	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	11,7662	0,0428433
2,46164	15,7306	0,233467
4,92329	20,0905	0,54282
7,38493	24,4962	0,783567
9,84658	28,8833	0,910946
12,3082	33,2666	0,966291
14,7699	37,6718	0,987881
17,2315	42,1161	0,99578
19,6932	46,619	0,998562
22,1548	51,1711	0,999514
24,6164	55,8012	0,999837
27,0781	60,5145	0,999946
29,5397	65,3288	0,999982
32,0014	70,2629	0,999994
34,463	75,3493	0,999998
36,9247	80,6817	0,999999
39,3863	86,1743	1
41,848	91,4648	1
44,3096	98,6622	1
46,7712	106,334	1
49,2329	115,862	1
51,6945	115,862	1
54,1562	115,862	1

56,6178	115,862	1
59,0795	98,7128	1
61,5411	65,8566	0,999984
64,0027	50,3977	0,999416
66,4644	40,9127	0,994378
68,926	33,9043	0,970866
71,3877	28,7303	0,907991
73,8493	24,4436	0,781408
76,311	20,9399	0,598277
78,7726	18,0493	0,398148
81,2343	15,6494	0,228094
83,6959	13,6457	0,11261
86,1575	11,9644	0,0482997
88,6192	10,5463	0,0182106
91,0808	9,34424	0,00611821
93,5425	8,31986	0,00185649
96,0041	7,4422	0,00051527
98,4658	6,68688	0,000132502
100,927	6,03327	3,18946E-05
103,389	5,46512	7,25929E-06
105,851	4,96886	1,57545E-06
108,312	4,53347	3,28497E-07
110,774	4,14985	6,62447E-08
113,236	3,81047	1,29948E-08
115,697	3,50906	0
118,159	3,24037	0
120,621	3	0

