Annex 5H

Main Risk Contributor to Potential Loss of Life associated with the Proposed Project Facilities

Table 5H.1 Main Risk Contributor to PLL for LNGC and FSRU Vessel Transit to the LNG Terminal at Operational Year (2020)

Ranking	Event	Description	PLL	Percentage
1	Collision_1500_LNGC_A	Flammable effect (pool fire and flash fire) of a large hole size (1,500 mm) release scenario due to collision for LNGC during marine transit approaching the LNG Terminal	1.43E-06	57.1
2	Collision_1500_LNGC_E	Flammable effect (pool fire and flash fire) of a large hole size (1,500 mm) release scenario due to collision for LNGC during marine transit departing the LNG Terminal due to bad weather, emergency events	4.19E-07	16.7
3	Collision_1500_LNGC_T	Flammable effect (pool fire and flash fire) of a large hole size (1,500 mm) release scenario due to collision for LNGC during marine transit	3.46E-07	13.8
4	Collision_750_LNGC_T	Flammable effect (pool fire and flash fire) of a medium hole size (750 mm) release scenario due to collision for LNGC during marine transit	8.74E-08	3.5
5	Collision_1500_FSRU_E	Flammable effect (pool fire and flash fire) of a large hole size (1,500 mm) release scenario due to collision for FSRU during marine transit departing the LNG Terminal due to bad weather, emergency events	8.07E-08	3.2
	Other		1.45E-07	5.8%
	Total		2.51E-06	100.0%

Table 5H.2 Main Risk Contributor to PLL for LNGC and FSRU Vessel Transit to the LNG Terminal at Operational Year (2030)

Ranking	Event	Description	PLL	Percentage
1	Collision_1500_LNGC_A	Flammable effect (pool fire and flash fire) of a large hole size (1,500 mm) release scenario due to collision for LNGC during marine transit approaching the LNG Terminal	1.69E-06	57.3
2	Collision_1500_LNGC_E	Flammable effect (pool fire and flash fire) of a large hole size (1,500 mm) release scenario due to collision for LNGC during marine transit departing the LNG Terminal due to bad weather, emergency events	4.92E-07	16.7
3	Collision_1500_LNGC_T	Flammable effect (pool fire and flash fire) of a large hole size (1,500 mm) release scenario due to collision for LNGC during marine transit	4.00E-07	13.5
4	Collision_750_LNGC_T	Flammable effect (pool fire and flash fire) of a medium hole size (750 mm) release scenario due to collision for LNGC during marine transit	1.01E-07	3.4
5	Collision_1500_FSRU_E	Flammable effect (pool fire and flash fire) of a large hole size (1,500 mm) release scenario due to collision for FSRU during marine transit departing the LNG Terminal due to bad weather, emergency events	9.59E-08	3.3
	Other		1.70E-08	5.8%
	Total		2.95E-06	100.0%

Table 5H.3 Main Risk Contributor to PLL for LNG Terminal at Operational Year (2020)

Ranking	Event	Description	PLL	Percentage
1	HKOLNGT_06_LR_FB	Fireball of a line rupture scenario for Natural gas from Regasification Unit, via metering, to Jetty (including HP Gas Loading Arm)	3.49E-06	75.5%
2	HKOLNGT_01_L_PF	Pool fire of a large leak scenario for LNG Loadout from LNGC, via Jetty, to LNG Storage Tank in FSRU Vessel	8.65E-07	18.7%
3	HKOLNGT_05_LR_FB	Fireball of a line rupture scenario for Regasification Trains	7.75E-08	1.7%
4	HKOLNGT_04_M	Flammable effect (jet fire and flash fire) of a medium leak scenario for LNG Booster Pump to Regasification Unit	1.83E-08	0.4%
5	HKOLNGT_03_L	Flammable effect (jet fire and flash fire) of a large leak scenario for LNG Transfer from LNG Storage Tank Pump to LNG Booster Pump	1.71E-08	0.4%
6	HKOLNGT_04_L	Flammable effect (jet fire and flash fire) of a large leak scenario for LNG Booster Pump to Regasification Unit	1.63E-08	0.4%
7	HKOLNGT_07_LR_FB	Fireball of a line rupture scenario for Natural gas in Jetty to ESDV of Riser for BPPS Subsea Pipeline	1.56E-08	0.3%
8	HKOLNGT_10_LR_FB	Fireball of a line rupture scenario for Natural gas in Jetty to ESDV of Riser for LPS Subsea Pipeline	1.56E-08	0.3%
9	HKOLNGT_04_S	Flammable effect (jet fire and flash fire) of a small leak scenario for LNG Booster Pump to Regasification Unit	1.54E-08	0.3%
10	HKOLNGT_08_LR_FB	Fireball of a line rupture scenario for Riser for BPPS Subsea Pipeline	1.14E-08	0.2%
	Other		8.24E-08	1.8%
	Total		4.62E-06	100.0%

Table 5H.4 Main Risk Contributor to PLL for LNG Terminal at Future Scenario Year (2030)

Ranking	Event	Description	PLL	Percentage
1	HKOLNGT_06_LR_FB	Fireball of a line rupture scenario for Natural gas from Regasification Unit, via metering, to Jetty (including HP Gas Loading Arm)	4.15E-06	75.5%
2	HKOLNGT_01_L_PF	Pool fire of a large leak scenario for LNG Loadout from LNGC, via Jetty, to LNG Storage Tank in FSRU Vessel	1.03E-06	18.7%
3	HKOLNGT_05_LR_FB	Fireball of a line rupture scenario for Regasification Trains	9.22E-08	1.7%
4	HKOLNGT_04_M	Flammable effect (jet fire and flash fire) of a medium leak scenario for LNG Booster Pump to Regasification Unit	2.18E-08	0.4%
5	HKOLNGT_03_L	Flammable effect (jet fire and flash fire) of a large leak scenario for LNG Transfer from LNG Storage Tank Pump to LNG Booster Pump	2.03E-08	0.4%
6	HKOLNGT_04_L	Flammable effect (jet fire and flash fire) of a large leak scenario for LNG Booster Pump to Regasification Unit	1.94E-08	0.4%
7	HKOLNGT_07_LR_FB	Fireball of a line rupture scenario for Natural gas in Jetty to ESDV of Riser for BPPS Subsea Pipeline	1.86E-08	0.3%
8	HKOLNGT_10_LR_FB	Fireball of a line rupture scenario for Natural gas in Jetty to ESDV of Riser for LPS Subsea Pipeline	1.86E-08	0.3%
9	HKOLNGT_04_S	Flammable effect (jet fire and flash fire) of a small leak scenario for LNG Booster Pump to Regasification Unit	1.83E-08	0.3%
10	HKOLNGT_08_LR_FB	Fireball of a line rupture scenario for Riser for BPPS Subsea Pipeline	1.35E-08	0.2%
	Other		9.80E-08	1.8%
	Total		5.50E-06	100.0%

Table 5H.5 PLL for BPPS Subsea Pipeline at Operational Year (2020)

Segment	Description	PLL (/yr)	Percentage
X	Jetty Approach to South of Soko Islands	6.49E-06	11.11%
A	Southwest of Soko Islands	2.82E-06	4.83%
B	Southwest of Fan Lau	2.35E-06	4.03%
C	Southwest Lantau	4.07E-05	69.67%
D	West of Tai O	1.89E-06	3.23%
E	West of HKIA	7.31E-07	1.25%
F	West of Sha Chau	2.79E-08	0.05%
G	West of Lung Kwu Chau	3.09E-08	0.05%
H	Lung Kwu Chau to Urmston Anchorage	1.30E-06	2.22%
I	Urmston Road	1.59E-06	2.71%
Total		5.84E-05	100.0%

Table 5H.6 PLL for BPPS Subsea Pipeline at Future Scenario Year (2030)

Segment	Description	PLL (/yr)	Percentage
X	Jetty Approach to South of Soko Islands	6.50E-06	10.99%
A	Southwest of Soko Islands	2.83E-06	4.78%
B	Southwest of Fan Lau	2.60E-06	4.40%
C	Southwest Lantau	4.08E-05	68.94%
D	West of Tai O	1.89E-06	3.20%
E	West of HKIA	8.11E-07	1.37%
F	West of Sha Chau	3.50E-08	0.06%
G	West of Lung Kwu Chau	3.57E-08	0.06%
H	Lung Kwu Chau to Urmston Anchorage	1.41E-06	2.39%
I	Urmston Road	1.72E-06	2.91%
Total		5.91E-05	100.0%

Table 5H.7 PLL for LPS Subsea Pipeline at Operational Year (2020)

Segment	Description	PLL (/yr)	Percentage
A	Jetty Approach to South of Shek Kwu Chau	1.54E-07	1.76%
B	South of Cheung Chau	2.81E-06	32.21%
C	West Lamma Channel	3.74E-06	42.85%
D	Alternative Shore Approach	2.02E-06	23.18%
Total		8.73E-06	100.0%

Table 5H.8 PLL for BPPS Subsea Pipeline at Future Scenario Year (2030)

Segment	Description	PLL (/yr)	Percentage
A	Jetty Approach to South of Shek Kwu Chau	1.90E-07	2.09%
B	South of Cheung Chau	3.00E-06	33.11%
C	West Lamma Channel	3.77E-06	41.59%
D	Alternative Shore Approach	2.10E-06	23.21%
Total		9.07E-05	100.0%

Table 5H.9 Main Risk Contributor to PLL for Construction Year (2020) at the BPPS

Ranking	Event	Description	PLL	Percentage
1	GRS_01_LR_IF_FB	Fire ball scenario due to a line rupture of Above ground piping from shore end to pig receiver of Y13-1 GRS	2.53E-07	15.51%
2	GRS_05_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from gas heaters to pressure reduction station, including PRS of Y13-1 GRS	2.30E-07	14.09%
3	GRS_04_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from inlet gas filter separator to gas heater of Y13-1 GRS	2.04E-07	12.46%
4	GRS_18_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from PRS to manifold, including HIPPS of Dachan GRS	1.52E-07	9.32%
5	GRS_03_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from slug catcher to inlet gas filter separators of Y13-1 GRS	1.00E-07	6.13%
6	GRS_06_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from pressure reduction station to outlet gas filter separator of Y13-1 GRS	9.17E-08	5.62%
7	GRS_02_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from receiver to slug catcher of Y13-1 GRS	8.64E-08	5.29%
8	GRS_12_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from receiver to gas filter of Dachan GRS	7.04E-08	4.31%
9	GRS_11_LR_IF_FB	Fire ball scenario due to a line rupture of Above ground piping from shore end to pig receiver of Dachan GRS	6.55E-08	4.01%
10	GRS_08_LR_IF_FB	Fire ball scenario due to a line rupture of Pig receiver of Y13-1 GRS	6.15E-08	3.77%
	Other		3.19E-07	19.5%
	Total		1.63E-06	100.0%

Table 5H.10 Main Risk Contributor to PLL for Operational Year (2020) at the BPPS

Ranking	Event	Description	PLL	Percentage
1	GRS_01_LR_IF_FB	Fire ball scenario due to a line rupture of Above ground piping from shore end to pig receiver of Y13-1 GRS	2.17E-07	11.58%
2	GRS_05_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from gas heaters to pressure reduction station, including PRS of Y13-1 GRS	1.79E-07	9.58%
3	GRS_04_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from inlet gas filter separator to gas heater of Y13-1 GRS	1.62E-07	8.66%
4	GRS_18_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from PRS to manifold, including HIPPS of Dachan GRS	1.38E-07	7.38%
5	NGRS_05_LR_IF_FB	Fire ball scenario due to a line rupture of WBH piping of New GRS	1.07E-07	5.73%
6	NGRS_07_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Pressure Reduction Station to Mixing Station of New GRS	1.05E-07	5.61%
7	NGRS_04_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Metering Station to WBH of New GRS	8.34E-08	4.45%
8	GRS_03_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from slug catcher to inlet gas filter separators of Y13-1 GRS	5.98E-08	3.20%
9	GRS_12_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from receiver to gas filter of Dachan GRS	5.49E-08	2.93%
10	NGRS_04_LR_IF_FF	Flash fire scenario due to a line rupture of Piping from Metering Station to WBH of New GRS	5.10E-08	2.72%
	Other		7.14E-07	38.2%
	Total		1.87E-06	100.0%

Table 5H.11 Main Risk Contributor to PLL for Future Scenario Year (2030) at the BPPS

Ranking	Event	Description	PLL	Percentage
1	GRS_01_LR_IF_FB	Fire ball scenario due to a line rupture of Above ground piping from shore end to pig receiver of Y13-1 GRS	2.23E-07	11.56%
2	GRS_05_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from gas heaters to pressure reduction station, including PRS of Y13-1 GRS	1.87E-07	9.70%
3	GRS_04_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from inlet gas filter separator to gas heater of Y13-1 GRS	1.68E-07	8.71%
4	GRS_18_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from PRS to manifold, including HIPPS of Dachan GRS	1.43E-07	7.42%
5	NGRS_05_LR_IF_FB	Fire ball scenario due to a line rupture of WBH piping of New GRS	1.10E-07	5.71%
6	NGRS_07_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Pressure Reduction Station to Mixing Station of New GRS	1.10E-07	5.70%
7	NGRS_04_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Metering Station to WBH of New GRS	8.60E-08	4.46%
8	GRS_03_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from slug catcher to inlet gas filter separators of Y13-1 GRS	6.20E-08	3.21%
9	GRS_12_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from receiver to gas filter of Dachan GRS	5.55E-08	2.87%
10	NGRS_04_LR_IF_FF	Flash fire scenario due to a line rupture of Piping from Metering Station to WBH of New GRS	5.21E-08	2.70%
	Other		7.32E-07	37.9%
	Total		1.93E-06	100.0%

Table 5H.12 Main Risk Contributor to PLL for Construction Year (2020) at the LPS

Ranking	Event	Description	PLL	Percentage
1	GRS_01_LR_IF_FB	Fire ball scenario due to a line rupture of Above ground existing piping from shore to existing GRS Trains	2.13E-08	32.09%
2	GRS_10_LR_IF_FB	Fire ball scenario due to a line rupture of Pig Receiver of the existing GRS	1.06E-08	15.91%
3	GRS_08_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Heater to Pressure Reduction Station (L9 Stream)	7.17E-09	10.78%
4	GRS_07_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Metering Skid to Heater (L9 Stream)	7.02E-09	10.56%
5	GRS_06_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Filter Skid to Metering Skid (L9 Stream)	5.57E-09	8.38%
6	GRS_02_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Filter Skid to Metering Skid (GT57 Stream)	3.05E-09	4.58%
7	GRS_03_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Metering Skid to Heater (GT57 Stream)	2.54E-09	3.83%
8	GRS_04_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Heater to Pressure Reduction Station (GT57 Stream)	2.35E-09	3.53%
9	GRS_01_LR_IF_FF2	Flash fire scenario due to a line rupture of Above ground existing piping from shore to existing GRS Trains	1.95E-09	2.93%
10	GRS_09_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Pressure Reduction Station (L9 Stream) to L9	1.15E-09	1.72%
	Other		3.78E-09	5.69%
	Total		6.65E-08	100.0%

Table 5H.13 Main Risk Contributor to PLL for Operational Year (2020) at the LPS

Ranking	Event	Description	PLL	Percentage
1	GRS_01_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Above ground existing piping from shore to existing GRS Trains	1.70E-08	17.03%
2	NGRS_01_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Above ground 20" piping from shore to Inlet of each New GRS Metering Train A	9.65E-09	9.65%
3	NGRS_27_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Pig Receiver of New GRS	7.91E-09	7.91%
4	NGRS_02_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Piping from Existing Gas Header to Inlet ESDVs of each New GRS Metering Train B	7.00E-09	7.00%
5	GRS_10_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Pig Receiver of the existing GRS	6.70E-09	6.70%
6	NGRS_28_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Piping from Existing Gas Header to Inlet ESDV (L10 Stream A)	6.08E-09	6.08%
7	GRS_08_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Piping from Heater to Pressure Reduction Station (L9 Stream)	5.47E-09	5.47%
8	NGRS_33_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Piping from New Gas Header to Inlet ESDV (L10 Stream B)	5.32E-09	5.32%
9	GRS_07_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Piping from Metering Skid to Heater (L9 Stream)	4.84E-09	4.84%
10	GRS_06_LR_IF_FB	Fire ball scenario due to a line rupture scenario of Piping from Filter Skid to Metering Skid (L9 Stream)	4.17E-09	4.17%
	Other		2.58E-08	25.83%
	Total		1.00E-07	100.0%

Table 5H.14 Main Risk Contributor to PLL for Future Scenario Year (2030) at the LPS

Ranking	Event	Description	PLL	Percentage
1	GRS_01_LR_IF_FB	Fire ball scenario due to a line rupture of Above ground existing piping from shore to existing GRS Trains	2.04E-08	17.03%
2	NGRS_01_LR_IF_FB	Fire ball scenario due to a line rupture of Above ground 20" piping from shore to Inlet of each New GRS Metering Train A	1.16E-08	9.65%
3	NGRS_27_LR_IF_FB	Fire ball scenario due to a line rupture of Pig Receiver of New GRS	9.49E-09	7.91%
4	NGRS_02_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Existing Gas Header to Inlet ESDVs of each New GRS Metering Train B	8.40E-09	7.00%
5	GRS_10_LR_IF_FB	Fire ball scenario due to a line rupture of Pig Receiver of the existing GRS	8.04E-09	6.70%
6	NGRS_28_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Existing Gas Header to Inlet ESDV (L10 Stream, Train 1)	7.30E-09	6.08%
7	GRS_08_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Heater to Pressure Reduction Station (L9 Stream)	6.56E-09	5.47%
8	NGRS_33_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from New Gas Header to Inlet ESDV (L10 Stream, Train 2)	6.38E-09	5.32%
9	GRS_07_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Metering Skid to Heater (L9 Stream)	5.81E-09	4.84%
10	GRS_06_LR_IF_FB	Fire ball scenario due to a line rupture of Piping from Filter Skid to Metering Skid (L9 Stream)	5.00E-09	4.16%
	Other		3.10E-08	25.85%
	Total		1.20E-07	100.0%