

Table 4E1. Calculation details for Event Frequency Associated with Helicopter Crash in Table 4.7

Scenario	ID given in the previous EIA	Equation*	Values used in the previous report	Values used in this study	Event Frequency Associated with Helicopter Crash
LPG Fire Loss Area (building collapsed)	D-LF-EX	(Freq of extreme initialising event × Number of LPG Cylinders × Probability of Storing 50kg LPG Cylinders) ^(number of cylinders for instantaneous release with offsite impact)	Freq of extreme initialising event = 1E-6 Number of LPG Cylinders = 500 Probability of Storing 50kg LPG Cylinders = 2.74E-04 number of cylinders for instantaneous release with offsite impact = 5	Helicopter Crash Rate = 1.91E-7 Freq of extreme initialising event = 1E-6+1.91E-7=1.19E-6 Number of LPG Cylinders = 500 Probability of Storing 50kg LPG Cylinders = 2.74E-04 number of cylinders for instantaneous release with offsite impact = 5	1.15E-34 (<< 1E-9)
Major Warehouse Fire (building collapsed)	D-WF-EX	Freq of extreme initialising event	Freq of catastrophic loss of a toxic inventory = 1E-6	Freq of catastrophic loss of a toxic inventory = 1E-6	1.19E-6
Pentane Fire Loss Area (building collapsed)	D-PF-EX	Freq of extreme initialising event	The probability of storing toxic inventory=2.74E-4	The probability of storing toxic inventory = 1E-6 The probability of storing toxic inventory=2.74E-4	1.19E-6
Chlorine toxic release (building collapsed)	DG-CT-W	Freq of catastrophic loss of a toxic inventory × The probability of storing toxic inventory			3.26E-10
Ammonia toxic release (building collapsed)	DG-AT-W	Freq of catastrophic loss of a toxic inventory × The probability of storing toxic inventory			3.26E-10

*See Appendix 11.4.2 of the previous EIA report

Table 4E2 Calculation details for Event Frequency Associated with Helicopter Crash in Table 4.6

Station 7	1	Cold catastrophic failure of LPG vessel (per year)	4.58E-07						
	OR								
	2	Spontaneous failure (per year)	3.60E-07						
	AND								
	4	Spontaneous failure (per vessel)	1.80E-07						
	5	No. of storage vessel	2						
	3	Vehicle Impact (per operation)	9.82E-08						
	AND								
	6	Failure of Pressure Relief Valve (per demand)	1.00E-04						
	7	Failure of Pump Overpressurization Protection (per demand)	1.00E-04						
8	No. of Operations per year	2454							
9	Failure of Overfilling (per operation)	2.00E-02							
10	Staff Fails to Rectify (per demand)	0.2							

The original fault tree can be found in Appendix 11.5.4

Catastrophic failure of LPG vessel in this study = Cold catastrophic failure of LPG vessel + helicopter crash rate = $4.58E-7 + 5.05E-8 = 5.08E-7$