

Appendix 11.2.2

***Assumptions of the Hazard Assessment for the
Existing Ma Tau Kok Gas Works North Plant
(MTKGWNP) and its Associated Facilities***

Appendix 11-2-2 – Assumptions for QRA modeling ^{Note A}

Item no.	Item	Parameter	Value	Unit	Ref
MTKGWNP					
1	naphtha tank 1	capacity	1779	cu.m	HKCG
2	naphtha tank 2	capacity	1779	cu.m	HKCG
3	naphtha tank	pressure (max)	4 (1)	" wg (kPa)	HKCG
4		diameter	12.2	m	HKCG
5		height	15.3	m	HKCG
6			670	kg/cu.m	HKCG
7	naphtha density		670	kg/cu.m	HKCG
8	Total capacity	capacity	3558	cu.m	HKCG
9	naphtha bund	area	866	sq.m	layout plan
10		height (assuming the bund can contain 105% of one tank volume) (= 1.05*(volume of 1 naphtha tank)/(bund area excluding naphtha tank) = 1.05*1779/632 = 2.96)	3	m	calculated
11		Aboveground ground naphtha pipeline	10	m	Assumed
12	gas holder No.4	capacity (volume)	25740	cu.m	HKCG
13	(for normal operation)	Capacity (weight)	18	ton	HKCG
14		diameter	39	m	HKCG
15		height	24	m	HKCG
16		pressure (max)	16 (4)	" wg (kPa)	HKCG
17	gas holder No.2 (backup and used when No.4 is under maintenance)	capacity	12740	cu.m	HKCG
18		Capacity (weight)	9	ton	HKCG

Item no.	Item	Parameter	Value	Unit	Ref
19		diameter	30	m	HKCG
20		height	21	m	HKCG
21		pressure (max)	16 (4)	" wg (kPa)	HKCG
22	gas holder inventory (in QRA model)	weight	19	ton	HKCG
23	no. of gas-making train in operation	any time (max)	4	train	HKCG
24		usually	2	train	HKCG
25		night shift (23:00 - 07:00)	0	train	HKCG
26	gas production train	throughput	1.3	MMSCFH per pair 2 trains	HKCG
27		No. of process vessels	2	Unit	Assumed
28		Length of aboveground pipeline	50	m	Assumed
29	General operation	Vehicle movements (north/south gate each)	10	Vehicles	Assumed
30	General operation	Length of access road (north/south gate each)	100	m	Assumed
31	Aboveground gas pipeline	Between production train and new compressor house	60	m	Assumed
32	Aboveground gas pipeline	Between new compressor house and main outlet	20	m	Assumed
Naphtha Jetty					
33	jetty replenishment operation	frequency	36	per year	HKCG
34	hose (stainless steel)	size (diameter)	0.2	m	HKCG
35	reverse flow control	automatic			HKCG
36	pressure	from jetty to storage tank	4	bar	HKCG
37	Tanker	Nominal Unloading Quantity	450	ton	HKCG
38		pressure	1	atm	HKCG
39		unloading time	3	hrs	HKCG
40		operating time	mid-night only		HKCG

Item no.	Item	Parameter	Value	Unit	Ref
41		Nominal flow rate	42	Kg/s	calculated
42	pipe to storage tank	size (diameter)	0.2	m	HKCG
43	Aboveground pipeline	Length	10	m	HKCG
44	safety measures	- double wall stainless steel loading arm - differential flow trip system - excess flow valve - non-return valve			HKCG
Pigging Station					
45	pipe size	size (diameter)	0.4	m	HKCG
46	operating pressure	(IP)	700	kPa	HKCG
Offtake Station					
47	IP Pipeline	size (diameter)	0.6	m	HKCG
48		pressure	700	kPa	HKCG
49	MP pipeline	size (diameter)	0.5	m	HKCG
50		pressure	240	kPa	HKCG
51	Aboveground pipeline	Length (MP pipeline)	8	m	Assumed

Properties of Naphtha

Property	Details
Flammability	Flammable
Auto-Ignition Temperature	>220 °C
Flash Points	-20 °C
Flammable Limits	1.1% (LOWER) – 5.9% (UPPER)
Specific Gravity	0.67 (water = 1)
Vapor Pressure	0.6 kPa (@ 20 °C)
Vapor Density	4 (air = 1)

Compositions and Properties of Towngas

Composition	% (By Volume)	Physical Properties	Values
Hydrogen	57.8%	Calorific Value MJ/M ³	17.27
Methane	2.7 %	Density @ 1atm (kg/m ³)	0.624
Carbon Dioxide	11.5 %	Wobbe Index	24
Carbon Monoxide	12.1 %	Weaver Flame Speed	35
Nitrogen, Oxygen & others	15.9 %		

Note A: Hong Kong China Gas Limited was consulted