Sherpa Ref: 20307-LET-001 REV0.DOCX

9 January 2009

Attention: Chris Ritchie
Manager – Manufacturing and Rural Industries
Major Development Assessment
NSW Department of Planning
23-33 Bridge Street
Sydney

Dear Mr Ritchie

RE: Warwick Farm Printing Project, Application Number 08_0088

Further to your request for information in Attachment A of your letter Ref S07/01943, I give the following responses.

Item 1 – In case of a fire involving inks, the fire fighting water will be contaminated. Brief information on the arrangements for containing contaminated fire fighting water should be provided.

The Fire Safety Study, following the requirements of HIPAP 2 (DoP, 1993), and undertaken prior to construction, would normally be used to describe the arrangements for contaminated firewater containment. The design of any firewater retention system required would follow the requirements of 'Best Practice Guidelines for Contaminated Water Retention and Treatment Systems',(McCracken, 1994).

Based on preliminary design information, the following details can be given which will be expanded upon in the Fire Safety Study to include design details for firewater containment:

- bunding for the toluene storage tanks, will be in accordance with the requirements of AS1940 (ME-017, 2004) including an allowance in the bund capacity for firewater application over 20 minutes.
- The printing machines will be fitted with a sophisticated fire detection and extinguishing system using carbon dioxide. This will limit the requirements for water to be used in this area.
- The paper storage area will incorporate a sprinkler system, but is segregated from plant items containing toluene to mitigate fire escalation and contaminated firewater generation.

In general, the design strategies against firewater contamination will consist of:

- Minimising available contaminants and remedial measures to minimize the likelihood of release
- Reducing the likelihood of fire
- Minimising the fire-fighting water requirements
- Containment of spillages and run-off

A detailed assessment of contaminated firewater containment will be undertaken in the Fire Safety Study when the detailed design is available.

Item 2 – The base leak frequency for a valve provided in Table 6.1 - Base Leak Frequencies used should be updated with information on the size of the valves to which the information applies. Furthermore it should be clarified if the frequency used is total frequency (i.e. accommodates all leak sizes and guillotine rupture) or is specific for a certain leak size.

The base valve leak frequency was extracted from HID data (HSE, 2002) for block valves sized <=3" and 3" to 11".

The leak sizes considered were for an equivalent hole diameter of <10mm and 10mm to 25mm, accounting for over 80% of the total leak frequency for each block valve size.

Item 3 – The event 1.01 PF: Bulk Storage - Fire in the Toluene Storage Bund is included in the frequency analysis because it has off-site impact. However, the frequency of a leak or rupture of a storage tank is not taken into account in the risk analysis. Although these type of failures are less likely to occur, an assessment should be performed and added to the overall frequency of 1.01 PF event.

The leak, or rupture of the storage tank may be added to the calculation in Table 6.2 of the PHA report (Johnson, 2008), and Table 1, in this letter, shows two larger leak sizes associated with the vessel in addition to the <=25mm leak size given in Table 6.2 of the PHA Report. An explanation of the parameters that were changed for the two new hole sizes in Table 1, in this letter, are given below:

- *Leak frequency* is taken from a study by the UK HSE (Nussey, 2006)
- *Operator Fails to Stop Leak* is assumed to have a probability of 1, ie he cannot stop a large leak
- *Ignition Probability* is related to the leak size, in this case the maximum probability is used for a 'mixed' material (Cox, et al., 1990) for the catastrophic leak; for the 50mm leak the release rate would be approximately 35kg/s which would relate to an ignition probability of 0.07.

Other probabilities are the same as those used in the initial assessment.

Table 1: Fire Frequency for Event 1.01 PF

Description	Frequency/Probability for each event		
	<=25mm	50mm	Catastrophic
Leak Frequency	7.30×10^{-3}	5.00×10^{-6}	2.00×10^{-6}
Operator Fails to Stop Leak	0.1	1	1
Ignition probability	0.01	0.07	0.3
Leak Fills Bund	1	1	1
Fire Detection and Protection ineffective	0.1	0.1	0.1
Wind in correct direction	0.4	0.4	0.4
Thermal Radiation Barrier Ineffective	1	1	1
Frequency	2.92×10^{-7}	1.40×10^{-8}	2.40×10^{-8}
Total Frequency	3.06×10^{-7}		

As seen in Table 1, above, the fire frequency for the revised calculation is 3.06×10^{-7}/year, increased from 2.92×10^{-7}/year. When added to the frequency of the other fire scenarios considered in the PHA Report, the overall risk does not significantly change, ie the overall risk reported in Table 6.7 of the PHA report and in the relevant sections of the EA remains 16×10^{-6} per year.

Yours sincerely

Phil Johnson
Principal Engineer
Sherpa Consulting Pty Ltd

References

Cox, A. W., Lees, F. P. and L., Ang M. 1990. *Classification of Hazardous Locations.* s.l. : Institution of Chemical Engineers, 1990.

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HSE. 2002. *Offshore Hydrocarbon Releases Statistics: 2001 HID Statistics Report.* 6th Edition. s.l. : HSE HID, 2002.

Johnson, Phil. 2008. *Preliminary Hazard Analysis - Warwick Farm Printing Project For Independent Print Media Group Pty Ltd.* Sherpa Consulting Pty Ltd. 2008. PHA.

McCracken, John. 1994. *Best Practice for Contaminated Water Retention and Treatment Systems.* NSW Govt. Hazardous Materials Policy Co-ordinating Committee. 1994.

ME-017. 2004. *AS 1940 The storage and handling of flammable and combustible liquids.* s.l. : Standards Australia, 2004.

Nussey, Clive. 2006. Failure frequencies for major failures of high pressure storage vessels at COMAH sites: A comparison of data used by HSE and the Netherlands. 2006.