LIQUIP W.A.

6 Bracks Street North Fremantle W.A. 6159
P O Box 293 Como W.A. 6152
Tel: (08) 9430 6230 Fax: (08) 9430 5051
Belgate Holdings P/L T/F The Spry F/T ACN 009 369 804

Ref: LIQDG1

May 10th 2001

Liquip Sales Pty Limited
13 Hume Rd
Smithfield NSW 2164

Attention: Mr David Gregory

Dear David

Re: Shell Terminal North Fremanlte

Please find enclosed a copy of the pressure testing carried out on tankers that load out of the Shell terminal, North Fremantle W A.

All of the vapour recovery hose couplings that are located at each load bay are very old Treloar couplings.

The following is what I found on a Caltex tanker loading at the Shell terminal on 10/5/01. The main problem as I see it is the vapour recovery hose and couplings, the pressure on the gantry gauge 3 kpa and the gauge on the tanker side of the hose (with 3 arms loading), is around 10-11 kpa.

We also had a gauge on the # 1 & # 6 hatch fill points, with 3 arms loading the # 1 compartment 10 ½ kpa and # 6 compartment 9 kpa.

These results are only for your records as they may be of value if asked to identify a problem.

Yours faithfully

Alan Spry
Manager

Encl.

Road Tanker Pressure Vacuum Vent Investigation Report

Shell North Fremantle Road Tanker Loading Gantry

Prepared by Katrina Lord (NFR:SE8)
Shell Engineering Limited

Distribution

Paul Goddard	NFR:OLW2
Dougal Cromar	NFR:OLW21
Tom Lewis	NFR:SE

CONTENTS

APPENDICES

1 SUMMARY

Paul Goddard (NFR:OLW2) requested Shell Engineering to investigate the high occurrence of road tanker PV vents venting off during loading at the Shell North Fremantle Gantry.

Pressure readings were recorded over three days while road tankers were loading at the Shell North Fremantle Gantry. Pressure readings were recorded at:

- The road tanker compartment
- The vapour valve between the road tanker and the vapour recovery hose
- Just upstream of the flame arrester in the pipework.

The following criteria were used to assess whether the results were acceptable:

1. Prevention of vapour escaping from road tanker compartments during loading, while maintaining the requirement of AS 2809.2 – Road Tank Vehicles for Dangerous Goods Part 2: Tankers for Flammable Liquids, section 2.3.6, for pressure vents on the road tanker compartments be set to open at 15 kPa and emergency vents to open at 30 kPa.

2. The requirement of AS 1940 - The Storage and Handling of Flammable and Combustible Liquids, section 7.2.5, that the back pressure on any tank vehicle caused by a vapour recovery system be no greater than 10 kPa.

In all recorded instances when loading occurred in any of the bays, either the road tanker compartment pressure reached 15 kPa and or the back pressure on the tanker from the vapour recovery system reached 10 kPa.

Restricting loading road tankers to three arms at time would significantly reduce the extent to which the pressure in the road tanker compartment reaches 15 kPa and the back pressure on the tanker from the vapour recovery system reaches 10 kPa.

Current practice at both the Shell Newport and Parramatta Terminals is for loading to be restricted to three arms per bay at a time. That rational for restricting loading to no more that three arms per bays is to meet the conditions set down in Australian Standards and AIP CP6. The practice of restricting loading to only three arms per bay is currently under review by Dennis Kimberley (MLB:OLM4) with a view to making it a national Shell standard.

Other options recommended in order to reduce the pressure losses in the vapour recovery system include:

- Investigate whether the poppet fittings on the vapour recovery hoses and vapour recovery connection in each bay are opening fully
- Investigate the option of each road tanker carrying its own hose with an open/straight through camlock fitting at the road tanker of the end of the hose and a poppet style fitting at the gantry end of the hose
- Install a "blower" in the line to push the vapour through the system.

Results recorded for the Haulplus "Thomas Tankers" are not included in the results section, on the basis that when tested, the "breather" vent at the rear of the combing was venting off, and or it appeared that their PV vents were venting off at pressures at less than 15 kPa.

2 METHOD

To measure the pressure losses that were occurring in the vapour recover system when a road tanker was loading at the gantry, the following procedure was used.

1. Two or more pressure gauges were mounted on the compartment dip points on top of the road tanker. A coupling with a pressure gauge was inserted between the vapour outlet of the road tanker and the vapour hose.

2. During loading of the road tanker pressure reading were observed at:
   - The road tanker compartments
   - The road tanker side of the vapour hose
   - Just upstream of the flame arrester (pressure gauge already insitu in line)

3. During loading, the maximum pressure reading at each gauge was recorded

4. Where possible a note was made of loading activities, which were occurring in other bays at the same time.

Pressure measurements and data recording were carried out by Michael Westbrook (Road Tanker Repairs) and Katrina Lord (NFR:SE8 Shell Engineering)

3 RESULTS

The following graphs show the pressure losses that occurred in the vapour recovery system during loading on:

- All days of recording
- Days two and three of recording.

Refer to Appendix A for tabulated results of pressure readings.

Refer to Appendix B for pressure losses through the vapour system when loading at each bay.