

## DANGEROUS GOODS PETRO INDUSTRIAL TANK COMPLIANCE CHECKLIST FORM

<b>Tank Manufacturer :</b> PETRO Industrial Pty Ltd	<b>Consultant Ref No.</b> Kelvin Cooper - Accreditation Number 6IM055	<b>File No.</b> KGC 150213
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<b>Proposed Storage :</b>  Petro Industrial 12   25   30   65   80   110 kL (nominal capacity) tanks LTT AND PT Series
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<b>Regulations or Australian Standard (s) used in this assessment :</b>  Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007 AS 1940 - 2004 AS 1692 - 2006
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**1.0 AS1692 - 2006 Review**

**Status**   OK  

<b>General :</b>  Review based on PETRO Industrial tank models - LTT and PT Series  Tank a category 3 - "Rectangular tanks and tanks of unconventional shapes, for above ground use, and intended principally for use on farms and other open space locations".			
Details	AS 1692 Clause No.	Status (is it ok?)	Notes/ Comments
General Requirements	2.2		

Design suitability	2.2.1	ok	Stress analysis reports completed using FEA; welded fitting compatible with tank construction material (mild steel with Yield Strength of 207 MPa and Ultimate Tensile Strength of 345 MPa.)
Materials of construction	2.2.2	ok	Mild steel
Welded joints	2.2.3	ok	Welding to AS 1554 - Tank assembly drawing LTT62DB-02-0002
Finishes and protective coatings	2.2.4	ok	Tank externally painted (epoxy primer and poly urethane top coat), no internal lining
Tank supports	2.2.5	ok	Tank corner mounts based on a standard 40 foot container "twist lock" fittings
Connections to underground tanks	2.2.6	n/a	Above ground
Liquid seal	2.2.7	ok	Pipe assembly drawing has suction inlet 25mm above the bottom pipe notch cut for both the dip and fill pipes
Access ladders and structures	2.2.8	ok	Certificate of compliance - design supplied for AS 1657 compliance
Liquid Level Indication	2.3		
General	2.3.1	ok	Dip stick supplied with tanks
Dipsticks	2.3.2	ok	Dip opening with cap; dip pipe (DN50) with 600 micron gauze cover pressure equalisation hole at top
Sight tubes	2.3.3	n/a	No sight tube fitted
Filling Provisions	2.4		
General	2.4.1	ok	Fill point location in front tank bay
Fill Pipe	2.4.2	ok	Fill pipe with drop tube (DN80)

Pressure equalisation	2.4.3	ok	Pressure equalisation hole at top of pipe with 600 micron gauze mesh covering
Head-high filling	2.4.4	ok	Fill point connection below top of tank
Draining and Normal Draw-Off	2.5	n/a	No low point drain. Water drain by suction spear via top tank opening
Manholes	2.6		
General	2.6.1	ok	2 x manways fitted
Size of manholes	2.6.2	ok	Tank access manway DN600
Multiple manholes	2.6.3	n/a	Horizontal tank
Manhole covers	2.6.4	ok	Flanged manway covers
Tank Vents	2.7		
General	2.7.1	ok	Free venting tank
Size of vent	2.7.2	ok	Vent riser pipe DN50. Minimum suggested vent diameter for filling at 1500 lpm being 32mm.
Vent terminal	2.7.3	ok	Vent discharge Donaldson filters
Testing	2.8	ok	
Leakage test	2.8.1	ok	Each tank subjected to leak test prior to surface treatment. Clause indicates that a hydrostatic test method should be used with the definition of "should" being a recommendation. Liquid penetrant test inspections completed for each tank.
Hydrostatic testing	2.8.2	Refer notes	Hydrostatic testing undertaken on range of tanks for design approval.

Air testing	2.8.3	Refer notes	Petro Industrial conduct a 35 kPa air test for 2 hour duration for every tank in the interstitial to provide leak testing for both inner and outer tank. Additional hydrostatic testing at random, however at a frequency of at least once per 100 units manufactured.
Handling and Transport	2.9	ok	Container style tank for lifting and transport
Tanks with Fire-Rated Coverings	2.10	n/a	Tank not fire rated

<b>Specific Requirements for Category 3 Tanks :</b>			
Tank a category 3 - "Rectangular tanks and tanks of unconventional shapes, for above ground use, and intended principally for use on farms and other open space locations".			
<b>Details</b>	<b>AS 1692 Clause No.</b>	<b>Status (is it ok?)</b>	<b>Notes/ Comments</b>
Category 3 Tanks	3.4	ok	
Material	3.4.1	ok	Tank material mild steel
Plate stiffness	3.4.2	ok	Stress analysis reports completed using FEA
Reference to Table 3.1		ok	Tanks manufactured with 6 mm SS400. FEA testing for bulging shows 46mm deflection at 25 psi (172 kPa)

## 2.0 AS1940 - 2004 Review

Status OK

Review of the requirements for above-ground tanks with integral secondary containment			
Details	AS 1940 Clause No.	Status (is it ok?)	Notes/ Comments
Requirements for tank with integral secondary containment	5.9		
General	5.9.1	ok	Double walled tank
Requirements for all tanks having integral secondary containment	5.9.2		
Tanks not used for PG I storage	5.9.2 a	ok	Combustible C1 product
Tank capacity shall not exceed 110kL for combustible liquids	5.9.2 b	ok	Tank capacity < 110 kL
Primary (inner tank) shall be construction to AS1692 or equivalent standard	5.9.2 c	ok	Constructed to AS1692 and UL 142 (Steel above ground tanks for flammable and combustible liquids) & ULC-S601 (Steel above ground tanks for flammable and combustible liquids)
Secondary containment shall be adequately designed and constructed to contain entire contents	5.9.2 d	ok	Stress Analysis reports completed using FEA.
System to monitor integrity of primary tank	5.9.2 e	ok	Interstitial monitoring dip point provided
Tank installation as per Cl 5.11 or 5.12.6	5.9.2 f	n/a	Tank installation or footing details outside scope
Escape of flammable vapours?	5.9.2 g	n/a	Combustible liquid only

Spacing between tanks	5.9.2.h	n/a	Single tank compliance however multiple tanks to be > 600 apart
Tank impact protection	5.9.2 i	n/a	Required for installation scope
Tank anti-syphon valve	5.9.2 j	ok	Model PI-ASV3 fitted. Opening pressure at 27.5 kPa at 3 m head
Level gauging; piping details;	5.9.2 k	ok	Tank supplied with calibrated dip stick. Access to dip stick by tank access ladder
Piping connections	5.9.2 l	ok	Safe Fill Limit at 95% of tank overall capacity for full compliance with this clause. Dipstick SFL and graduation markings documented on dipstick drawings.
Tank manifolding	5.9.2 m	n/a	Based on single tank installation. However if manifolded tanks unable to be overfilled
Overfill protection - alarm sys & control valve	5.9.2 n	ok	High level alarm fitted and connected to alarm sounder in pump bay
Spill containment system (min 15 l)	5.9.2 o	ok	Spill containment within pump bay and at top of tank dip point. Capacity > 15 litres. Spill box on tank top 0.644m x 0.237m x 0.100 m = 15.3 litres.
Separation distance (multi compartment)	5.9.2 p	n/a	Single compartment tank
Venting	5.9.2.q	ok	Vent connection DN50
Interstitial space venting	5.9.2 r	ok	Model PI-IV4 (O-ring sealed cap) with opening pressure at 13 kPa
Additional requirements for double-walled tanks	5.9.3		
Primary and secondary steel construction	5.9.3 a	ok	Inner and outer constructed of steel
Separation distances as per clause 5.7	5.9.3 b	n/a	Separation distance site specific

External fire-rated covering	5.9.4	n/a	Not fire rated
Integrated spillage compounds	5.9.5	n/a	No integrated spillage compound

**3.0 SUMMARY**

PETRO LTT and PT Series Tank **complies** / ~~does not comply~~ with the Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007.

**Additional Notes**

Review is to ensure that storage tank is designed so that it is adequate for any load and pressure to which it might be subjected (AS1692 Clause 2.2.1 Design Suitability) and complies with the Dangerous Goods Safety (Storage and handling of non-explosives) Regulations 2007 and in particular Regulation 135 which states:

A manufacturer or supplier of a storage or handling system or dangerous goods pipeline must ensure that the system or pipeline has been designed and built so that, so far as practicable, it can be operated with minimal risk to people, property and the environment.

**NAME OF CONSULTANT**      Kelvin Cooper

**DATE** : 15<sup>th</sup> February 2013

**SIGNATURE** 

**Rev 1** : 4<sup>th</sup> March 2013