

Health and Safety at Work (Hazardous Substances—Reduced Secondary Containment for Certain Above Ground Stationary Tanks) Safe Work Instrument 2017

This safe work instrument is approved under section 227 of the Health and Safety at Work Act 2015 by the Minister for Workplace Relations and Safety, after being satisfied that appropriate consultation has been carried out under section 227(3) of that Act.

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Safe Work Instrument

1 Title

This is the Health and Safety at Work (Hazardous Substances—Reduced Secondary Containment for Certain Above Ground Stationary Tanks) Safe Work Instrument 2017.

2 Commencement

This safe work instrument comes into force on 1 December 2017.

3 Overview

For the purpose of regulation 17.100(3)(b) of the Regulations, this safe work instrument—

- (a) reduces the capacity that a secondary containment system is required to have under the Regulations for stationary tanks with integral secondary containment; and
- (b) specifies the requirements to be met before the secondary containment capacity of a stationary tank with integral secondary containment may be so reduced.

4 Interpretation

- (1) In this safe work instrument, unless the context otherwise requires,—

Act means the Health and Safety at Work Act 2015

aerodrome—

- (a) means any defined area of land or water intended or designed to be used either wholly or partly for the landing, departure, and surface movement of aircraft; and
- (b) includes any buildings, installations, and equipment on or adjacent to any such area used in connection with the aerodrome or its administration; but
- (c) does not include—
 - (i) Auckland Airport; or
 - (ii) Hamilton Airport; or
 - (iii) Wellington Airport; or
 - (iv) Christchurch Airport; or
 - (v) Queenstown Airport; or
 - (vi) Dunedin Airport

AS 1692:2006 means the Australian standard on Steel tanks for flammable and combustible liquids

bulk fuel storage and distribution site means a site that—

- (a) has a storage capacity in excess of 2 000 000 L; and

(b) is used for the storage and distribution of bulk fuels

double skin tank means a stationary tank that—

- (a) has integral secondary containment where,—
- (i) the tanks are configured as—
 - (A) two cylindrical tanks, one inside the other; or
 - (B) a cylindrical primary tank inside a secondary tank; or
 - (C) a rectangular or square primary tank inside a secondary tank; and
 - (ii) the secondary tank—
 - (A) fully envelops the primary tank; or
 - (B) in the case of a primary tank that is rectangular or square in its design, fully envelops the primary tank or extends to the top of the side walls of the primary tank; and
 - (iii) both tanks—
 - (A) have been designed and fabricated in accordance with AS 1692:2006; and
 - (B) have at least the wall thicknesses specified for their size in AS1692:2006, provided that this is no less than 3 mm; and
 - (C) have been certified by a compliance certifier approved for the purpose by WorkSafe; and

(b) may or may not be mounted on a frame with skids

double skin tank – impact protected—

- (a) means a double skin tank that has a secondary tank that fully envelops the primary tank; and
- (b) complies with clause 21 of UL 2085 or clause 5.2 of SwRI 95-03, with compliance to be determined by either—
- (i) testing; or
 - (ii) if the primary tank and secondary tank each have a minimum wall thickness of 6 mm, through analysis or previous experience; and
- (c) has been tested in accordance, and complies, with the provisions of clause 20 of UL 2085 or clause 5.3 of SwRI 95-03; and
- (d) includes a double skin tank produced as part of, or added at a later stage to, a range of a fabricator's double skin tanks, but only if—
- (i) any other double skin tank in the range meets the definition in paragraph (a) (the test tank); and

- (ii) the thickness of the tank shell and the end plates of the double skin tank is at least as thick as those of the test tank; and
- (iii) subject to subparagraph (v), the number of legs or cradles on the double skin tank is no less than the number of legs or cradles on the test tank; and
- (iv) subject to subparagraph (v), the design elements of the double skin tank are substantially the same as the design elements of the test tank, including each leg, each cradle, the hold down configuration and the weld detail; and
- (v) for a range that includes tanks that have cradles or legs—
 - (A) the test tank has legs; and
 - (B) the hold-down configuration of the double skin tank (including the number of bolts, the size and specification of bolts, and the foundation detail) is similar to that of the test tank, regardless of whether the double skin tank has legs or cradles; and
- (vi) the diameter of the double skin tank is not less than 70% nor more than 120% of the test tank

farm means an area of land that is not less than 4 ha in size used principally for the purpose of agriculture

industrial place means an area zoned or used for the purpose of industrial activities, and includes a truck stop, transport yard or construction site located in such an area

integral secondary containment, in relation to a stationary tank, means that the tank—

- (a) is fabricated with a primary (inner) tank and a secondary (outer) tank; and
- (b) has an interstitial space between the primary tank and the secondary tank that is capable of being monitored

isolated place means a place such as a transport yard, truck stop, construction site, forestry site or mining area that is located in a rural locality and which abuts an area of low intensity land use

multi-hazard tank includes a—

- (a) multi-hazard tank – 2 hour; and
- (b) multi-hazard tank – 4 hour

multi-hazard tank – 2 hour means a stationary tank that—

- (a) has integral secondary containment where—
 - (i) the secondary tank fully envelops the primary tank; and
 - (ii) the primary and secondary tanks are designed and fabricated to the same standard; and

- (iii) the interstitial space may contain material that provides an insulating barrier; and
- (iv) the stationary tank has been designed, fabricated and tested in accordance with—
 - (A) UL 2085; or
 - (B) SwRI 93-01, including impact protection as though impact protection is not provided by guard posts; and
- (b) has been certified by a compliance certifier approved for that purpose by WorkSafe; and
- (c) may or may not be mounted on a frame with skids

multi-hazard tank – 4 hour means a stationary tank that—

- (a) satisfies paragraphs (a)(i) to (iii), (b) and (c) of the definition of a multi hazard tank – 2 hour; and
- (b) has been designed, fabricated and tested in accordance with SwRI 95-03

rural locality means a country or non-urban locality that is—

- (a) used for the production of primary products (for example, agricultural, pastoral, horticultural, or forestry industries) or similar purposes; or
- (b) set apart as a reserve; or
- (c) zoned rural in a district plan

Regulations means the Health and Safety at Work (Hazardous Substances) Regulations 2017

SwRI 93-01 means the South West Research Institute test procedure 93-01 Testing Requirements for Protected Aboveground Flammable Liquid/Fuel Storage Tanks

SwRI 95-03 means the South West Research Institute test procedure 95-03 Testing Requirements for Multi-Hazard Protected Aboveground Flammable Liquid/Fuel Storage Tanks

UL 2085 means the Underwriter Laboratories standard for Protected Aboveground Tanks for Flammable and Combustible Liquids issued 01 December 1999

- (2) Any term or expression that is defined in the Act or the Regulations and used, but not defined, in this safe work instrument has the same meaning as in the Act or the Regulations.

5 Application

- (1) Subject to subclause (2), this safe work instrument applies to an above ground stationary tank that—
 - (a) is in a place required by the Regulations to have a secondary containment system; and
 - (b) is used to contain a hazardous liquid that is a class 3.1 flammable substance.

- (2) This safe work instrument does not apply to an above ground stationary tank that is located in a building, unless the tank—
 - (a) has a 4-hour fire rating that complies with the requirements of SwRI 95-03; and
 - (b) is of a design listed on the record of certified designs and fabricators referred to in regulation 17.95 of the Regulations.

Reduced secondary containment capacity

6 Secondary containment capacity for tanks may be reduced

- (1) The capacity of the secondary containment system for an above ground stationary tank may be reduced in accordance with subclause (2), if—
 - (a) the tank is a double skin tank, a double skin tank – impact protected, or a multi-hazard tank; and
 - (b) the relevant PCBU ensures the tank is designed, manufactured, installed and operated in accordance with clauses 7 to 18 of this safe work instrument.
- (2) The capacity of a secondary tank of a double skin tank, a double skin tank – impact protected, or a multi-hazard tank may be reduced from at least 110% of the primary tank to at least 100% of the primary tank.
- (3) To avoid doubt, the relevant PCBU must ensure that the tank complies with all other applicable requirements prescribed by the Regulations.

Reduced secondary containment requirements

7 Fittings and fill level

A double skin tank, a double skin tank – impact protected, and a multi-hazard tank must comply with the following requirements:

- (a) piping connections to the tank must enter through the top of the tank;
- (b) there must be a means of preventing the release of liquid by siphon flow from the tank;
- (c) the tank must be equipped with a calibrated liquid level indicator (for example, a dipstick or gauge), that is accessible to the person delivering the substance into the tank;
- (d) the safe fill level of the tank must be identified on the dipstick or gauge;
- (e) the tank and any compartments within the same tank must not be interconnected or manifolded unless provision is made to prevent them from being over filled.

8 Overflow prevention

- (1) A double skin tank, a double skin tank – impact protected, and a multi-hazard tank must have a principal means and a secondary means of preventing an overflow of liquid, in accordance with subclauses (2) and (3).

- (2) The principal means of preventing an overflow must be an operational procedure which ensures the tank is not over filled (for example, by checking the ullage and then filling while ensuring this ullage is not exceeded).
- (3) The secondary means of preventing an overflow must be—
 - (a) for a tank that is filled directly by a nozzle,—
 - (i) a nozzle that has an automatic shutdown device (for example, one that senses a change in pressure); and
 - (ii) a means of spill containment that—
 - (A) is separate from the integral secondary containment; and
 - (B) meets the requirements of clause 9 below; or
 - (b) for a tank that is supplied by a transfer pump, a delivery system that is shut down upon activation by a high level probe mounted inside the tank above the safe fill level; or
 - (c) for a tank that is supplied by pump from the delivery tank wagon through a closed connection, a mechanical over fill protection valve; or
 - (d) an audible alarm activated by a probe mounted inside the tank.

9 Secondary containment for fill point

- (1) Every fill point on a double skin tank, a double skin tank – impact protected, and a multi-hazard tank must be provided with a means of secondary containment that will ensure any spillage of liquid during delivery operations is captured.
- (2) Subject to subclause (3), the means of secondary containment for the fill point must be of sufficient capacity to contain the volume of liquid that would be left in the pipe work and delivery hose, if the coupling was disconnected without the pipe work and delivery hose being drained free.
- (3) The capacity required by subclause (2) must be not less than 15 L in any case.
- (4) Despite subclause (1), secondary containment at the fill point is not required if—
 - (a) dry break couplings are used; and
 - (b) a secondary isolating valve is fitted.
- (5) In this clause, **means of secondary containment** includes an impermeable area around the fill point.

10 Venting of tanks

The venting of the primary tank and the space between the primary and secondary tanks of a double skin tank, a double skin tank – impact protected, and a multi-hazard tank must—

- (a) comply with Regulations 17.7 and 17.8; and
- (b) be based on the lowest flash point substance in any of the compartments.

11 Marking of tanks

In addition to complying with the requirements for marking in regulation 17.76 of the Regulations, if a double skin tank, a double skin tank – impact protected, or a multi-hazard tank is a multi-compartment tank, the tank must have fill points tagged with durable symbols identifying the hazardous substance stored in the tank and its compartments.

12 Means of monitoring interstitial space and primary tank

A double skin tank, a double skin tank – impact protected, and a multi-hazard tank must have a means to monitor the interstitial space between the primary and secondary tanks.

13 Release of flammable vapour or liquid

If flammable vapour or liquid could be released from a double skin tank, a double skin tank – impact protected, or a multi-hazard tank, a hazardous area must be established in accordance with regulation 10.6(1) of the Regulations.

14 Tanks with multiple compartments

If a double skin tank, a double skin tank – impact protected, or a multi-hazard tank is a multiple compartment tank, the compartments may be either,—

- (a) used for the same substance or for different grades of the same substance (such as 91 octane and 95 octane motor gasoline), in which case, if the primary tank is of steel construction, the bulkhead between the compartments must be welded on both sides; or
- (b) used for dissimilar substances, in which case, if the primary tank is of steel construction—
 - (i) there must be a double bulkhead with a monitored interstitial space between the compartments; or
 - (ii) the bulkhead between the compartments must be—
 - (A) welded on both sides; and
 - (B) at least 2 mm thicker than the wall of the primary tank.

15 Affixing tanks to ground

A double skin tank, a double skin tank – impact protected, and a multi-hazard tank must be fixed to the ground if—

- (a) a pipe extends from the tank to a dispenser, pump or other item of equipment that is separate from the tank and its support structure; or
- (b) an electrical cable is attached to the tank and there is insufficient allowance for tank movement (for example, through the use of a cable coil or loop).

16 Testing tanks for leakage

- (1) A double skin tank, a double skin tank – impact protected, and a multi-hazard tank must be tested for leakage prior to use.
- (2) Subject to subclause (3), leakage testing must be carried out in accordance with the specifications of the standard to which the tank is designed.
- (3) In the absence of a specification, testing must be carried out in accordance with the following:
 - (a) the primary tank must be leak tested by—
 - (i) applying an internal air pressure of 35 kPa; and
 - (ii) while maintaining that pressure, ensuring there is no evidence of leakage, which is to be determined by—
 - (A) observing no drop of air pressure during a period of at least one hour; and
 - (B) where it is practicable to do so, completing a soapy water test around all joints; and
 - (b) if the secondary tank is of steel construction, it must be tested by one of the following methods and there must be no evidence of leakage:
 - (i) pressurising the interstitial space to 35 kPa while maintaining pressure on the primary tank in accordance with paragraph (a) above; or
 - (ii) vacuum testing the interstitial space for 1 hour to at least -10 kPa.
- (4) If there is evidence of leakage before or after a double skin tank, a double skin tank – impact protected, or multi-hazard tank has been installed, the tank must not be used until—
 - (a) the leakage has been identified and remedied; and
 - (b) the tank has been re-tested; and
 - (c) there is no evidence of any leakage.
- (5) If a double skin tank, a double skin tank – impact protected, or multi-hazard tank is transported to site under pressure or vacuum and this is not maintained upon arrival at the site, the tank must—
 - (a) be re-tested in accordance with the provisions of subclauses (2) or (3); and
 - (b) if necessary, repaired, and the repairs documented.

17 Classes of hazardous substance and capacity of tanks permitted at specified locations

- (1) Subject to subclause (2), a double skin tank, a double skin tank – impact protected, or a multi-hazard tank at a location specified in column 1 of the table in the Schedule may only contain a class of hazardous substance permitted for a tank of that type at that location, as specified in column 2, 3, 4, or 5 (as applicable), provided that—

- (a) the capacity of the tank does not exceed the relevant maximum capacity; and
 - (b) in the case of a double skin tank - impact protected, the tank meets all other relevant conditions.
- (2) In the case of a tank with multiple compartments containing different hazardous substances, the tank must comply with subclause (1) as if the tank is used to contain only the lowest flash point hazardous substance.
- (3) In subclause (1),—
- (b) **relevant conditions** means the conditions prescribed in column 3 of the table in the Schedule and under which a double skin tank – impact protected is permitted to contain the specified class of substance when the tank is at the corresponding location specified in column 1 of the table:
 - (c) **relevant maximum capacity** means the maximum capacity—
 - (i) prescribed in column 2, 3, 4, or 5 (as applicable) of the table in the Schedule for a type of tank that is permitted to contain the specified class of substance when the tank is at the corresponding location specified in column 1 of the table; and
 - (ii) calculated on the basis of the aggregate volume of the total tank.

18 Barriers

If there is a reasonably foreseeable risk that a double skin tank, a double skin tank – impact protected, or a multi-hazard tank may be subjected to an impact that will result in loss of containment, the PCBU with management or control of the tank must ensure it is protected from the potential sources of such an impact by a barrier positioned—

- (a) at a distance from the tank that is sufficient to prevent the impact; and
- (b) in every case, at a distance of at least 400 mm from the tank.

Schedule

Classes of hazardous substance and capacity of tanks permitted at specified locations

Clause 17

Location	Type of tank			
	Double skin tank	Double skin tank - impact protected	Multi-hazard tank - 2 hour	Multi-hazard tank - 4 hour
A farm, isolated place or a bulk fuel storage and distribution site	Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 60 000 L	Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 110 000 L	Permitted for a tank containing a class 3.1A or 3.1B substance and having a maximum capacity of 60 000 L Permitted for a tank containing a class 3.1C or 3.1D substance and having a maximum capacity of 110 000 L	Permitted for a tank containing a class 3.1A, 3.1B, 3.1C or 3.1D substance and having a maximum capacity of 110 000 L
An aerodrome	Not permitted for classes 3.1A, 3.1B, 3.1C, or 3.1D	Permitted for a tank containing a class 3.1C or 3.1D substance and having a maximum capacity of 50 000 L, if— (a) the area beneath the tank and extending at least 6 m from the plan area of the tank is kept free of other hazardous substances and combustible materials and weeds; and (b) the minimum	Permitted for a tank containing a class 3.1C or 3.1D substance and having a maximum capacity of 60 000 L	Permitted for a tank containing a class 3.1A, 3.1B, 3.1C or 3.1D substance and having a maximum capacity of 110 000 L

Location	Type of tank			
	Double skin tank	Double skin tank - impact protected	Multi-hazard tank - 2 hour	Multi-hazard tank - 4 hour
		<p>distance between the tank and the aircraft fill point is 8 m; and</p> <p>(c) the minimum separation distance from an area of regular habitation is 50 m</p>		
An industrial place	Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 30 000 L	<p>Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 30 000 L</p> <p>Permitted for a tank containing a class 3.1D substance and having that a maximum capacity of between 30 000 L and 80 000 L, if the tank is at a truck stop, transport yard or construction site</p>	<p>Permitted for a tank containing a class 3.1C substance and having a maximum capacity of 30 000 L</p> <p>Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 80 000 L</p>	<p>Permitted for a tank containing a class 3.1A, 3.1B or 3.1C substance and having a maximum capacity of 60 000 L</p> <p>Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 110 000 L</p>
Locations other than the above	Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 30 000 L	Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 30 000 L	Permitted for a tank containing a class 3.1D substance and having a maximum capacity of 70 000 L	<p>Permitted for a tank containing a class 3.1A, 3.1B or 3.1C substance and having a maximum capacity of 60 000 L</p> <p>Permitted for a tank containing class 3.1D</p>

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Location	Type of tank			
	Double skin tank	Double skin tank - impact protected	Multi-hazard tank - 2 hour	Multi-hazard tank - 4 hour
				substance and having a maximum capacity of 110 000 L

Dated at Wellington this [date] day of [month] [2017].

[Name],
Minister for Workplace Relations and Safety

Date of notification in *Gazette*:

This safe work instrument is administered by WorkSafe New Zealand.