

Public consultation

*HAZARDOUS SUBSTANCES
SAFE WORK INSTRUMENTS*

June 2022



Te Kāwanatanga o Aotearoa
New Zealand Government

WORKSAFE
Mahi Haumarū Aotearoa



CONTENTS

Purpose	1
How to have your say	1
About safe work instruments	2
Proposed amendments	2

table

SWI clauses and regulations modified	3
--------------------------------------	---

Purpose

WorkSafe New Zealand is consulting on a proposed safe work instrument (SWI) under the Health and Safety at Work Act 2015 (HSWA) for tank wagons, specifically tank wagons used to transport and transfer hazardous bituminous substance with a flash point of more than 60°C (**bitumen tank wagons**) and tank wagons that are loader refuellers (**loader refuellers**).¹

We would like feedback on the proposed requirements outlined further below. Your feedback will help determine whether the proposed requirements are appropriate for these tank wagons.

How to have your say

You can find the SWIs, a response forms, and information on providing a submission here: worksafe.govt.nz

Submissions can be made by email to: regulatory.frameworks@worksafe.govt.nz

The deadline for receiving submissions is **Friday 22 July 2022**.

Your submission may be made public

The Official Information Act 1982 (OIA) allows New Zealand citizens and permanent residents, or anyone in New Zealand, to request official information from the government – including copies of submissions.

WorkSafe will let you know if we receive an OIA request for a copy of your submission. The content of your submission may be made available to the public; however, you can indicate on the response form whether you would prefer your details to be kept confidential.

WorkSafe will manage any personal information you supply in accordance with the Privacy Act 2020.

Next steps

Once consultation has closed, WorkSafe will analyse submissions, and as appropriate, use the feedback to inform the final design of the proposed SWI.

We will then present the SWI to the Minister for Workplace Relations and Safety for consideration. If approved, we will:

- notify the SWIs in the New Zealand Gazette
- publish the SWIs on WorkSafe's website: worksafe.govt.nz
- publish a summary of submissions.

Our contact details

If you have any questions about this consultation, please contact: regulatory.frameworks@worksafe.govt.nz

¹ Only clauses 13 and 14 propose requirements for loader refueller. All the other clauses described below propose requirements for bitumen tank wagons only.

About safe work instruments

A safe work instrument (SWI) is a form of legislation that supports or complements regulations. SWIs allow greater flexibility and more timely updates to the regulatory framework to reflect changes in technology, standards, and health and safety practices.

The WorkSafe New Zealand Act 2013 gives WorkSafe the function of developing SWIs. Section 227 of HSWA allows SWIs to define terms, prescribe matters, or make other provision in relation to any activity or thing, including (without limitation) listing standards, control of substances, and competency requirements. SWIs have legal effect only if they are referred to in regulations.

A SWI must be approved by the Minister for Workplace Relations and Safety. To approve a SWI, the Minister must be satisfied that the appropriate persons and organisations have been consulted.

There is more information about SWIs on our website: worksafe.govt.nz

Why is a SWI needed?

Part 16 of the Health and Safety at Work (Hazardous Substances) Regulations 2017 (the Regulations) specifies requirements for tank wagons and transportable containers, as they are defined in the Regulations.

Tank wagons transporting hazardous substances, including bitumen tank wagons and aircraft refuellers, are required to comply with the Regulations.

The proposed SWI applies to bitumen tank wagons that carry '**hazardous bituminous substance**'. We have developed the term hazardous bituminous substance for the purposes of the SWI, to mean a substance used in roading that contains bitumen and is a hazardous substance as defined in regulation 4 of the Regulations.

Bitumen tank wagons heat hazardous bituminous substance so it remains in a liquid state for spraying or application onto a road surface.

The heating elements in the tank wagons and fittings for spraying or applying hazardous bituminous substance prevent them from meeting some of the design and construction requirements in the Regulations.

When proposing requirements for bitumen tank wagons, we have considered the hazards posed by hazardous bituminous substance and by the tank wagons that carry it.

Proposed requirements

WorkSafe proposes to establish a SWI that will set out requirements for bitumen tank wagons. Specifically, the SWI will:

- set out **additional requirements** that apply to the design, construction, installation, operation, testing, inspection, or compliance certification of tank wagons
- state which provisions of the regulations will apply to tank wagons in a way that is **modified** by the SWI.

The SWI is made up of 18 separate clauses. The purpose and need for each clause are presented below. All regulatory references are to the Health and Safety at Work (Hazardous Substances) Regulations 2017 unless otherwise stated.

Summary of clauses

Clause 1 to 5 are generic application and scene setting clauses that guide the application and interpretation of the SWI.

Clause 6 to 18 contain proposed additional and modified requirements for the tank wagons to be covered by this SWI. The table below lists the SWI clause number, the regulation proposed to be modified by that clause, and the clause heading.

SWI CLAUSE	REGULATION MODIFIED	CLAUSE HEADING
6	N/A – additional requirements	Additional requirements to withstand expansion
7	16.7	Modified requirements to withstand stress of load where free vent incorporated
8	16.12	Fittings impact resistance
9	16.13	Maximum compartment size
10	16.15	Loss minimisation while transferring liquid or gases
11	16.20	Stability and manoeuvrability
12	16.20	Stability and manoeuvrability requirements for existing tank wagons
13	16.22	Rear-end collision protection
14	16.23	Rear run-under by small vehicle
15	16.34	Requirements for issue of pre-commissioning compliance certificates
16	16.36	Requirements for issue and renewal of in-service compliance certificates
17	16.40	Transfer of liquid or gas
18	16.45	Persons with access

TABLE 1: SWI clauses and regulations modified

CLAUSE 6: ADDITIONAL REQUIREMENTS TO WITHSTAND EXPANSION

What does clause 6 of the SWI do?

Clause 6 of the SWI sets additional requirements for tanks with a minimum capacity of at least 2000L.

It will require the Person Conducting a Business or Undertaking (PCBU) to ensure the tank has a venting configuration that allows for the expansion and contraction of the contents of the tank during heating and cooling cycles.

It will require the PCBU to ensure that the tank enables the release of vapours using a venting configuration that incorporates a free vent or a pressure vacuum vent.

The clause will prescribe requirements for the two types of vents that may be used:

- i. **Free vent**, which is required to be open to the atmosphere, prevent rainwater or foreign matter from entering the tank, be constructed of straight pieces to allow efficient disassembly, and have a minimum nominal bore hole of 50mm.
- ii. **Vacuum pressure vent**, which is required to vent to the atmosphere and to be marked with specific manufacture information; able to minimise any effects of the contents contacting it; accompanied with a secondary venting mechanism; and annually tested to be fit for purpose.

Both vents will be required to prevent unsafe pressures during all operations, including when filling and emptying the tank wagon.

Why are we creating additional requirements for vents on bitumen tank wagons?

The Regulations do not set detailed requirements for vents.

Vents perform an essential function on bitumen tank wagons. Bitumen tank wagons heat hazardous bituminous substance so that it remains in a liquid state for spraying or application onto a road surface. Bitumen undergoes a significant volume change when heated or cooled and may release vapours. Venting alleviates the pressures associated with this change in volume.

The requirements in the SWI will address this by setting minimum safety requirements for the vents used in bitumen tank wagons to manage the risk posed by the content of the tanks.

Free vents are used in tanks that hold heated hazardous bituminous substance, which can congeal and block a pressure vacuum vent. However, some hazardous bituminous substances do not require heating, so the SWI will also include detailed requirements for pressure vacuum vents if they are used.

CLAUSE 7: MODIFIED REQUIREMENTS TO WITHSTAND STRESS OF LOAD WHERE FREE VENT INCORPORATED

What does clause 7 of the SWI do?

Regulation 16.7(1) for bitumen tank wagons requires a PCBU to ensure that when the tank is undergoing stresses it complies with conditions regarding leakage that may occur from the tank.

The regulated conditions vary depending on whether the tank is upright, on its side, or upside down. When the tank is upright there may be no visible leakage; when it is on its side or upside down there may be no more than 0.3L of leakage per day.

Clause 7 will replace the leakage conditions in clause 16.7(1) for an upright bitumen tank wagon by:

- i. requiring the free vent to be positioned in a way that eliminates spillage through sloshing, and
- ii. requiring a container to be placed to collect liquid or condensate produced by the tank during normal operation and heating.

It will also require a bitumen tank wagon to retain at least half its liquid contents when it is on its side, or all its contents when it is upside down.

Why are we proposing these modifications?

Bitumen tank wagons operating free vents are unable to meet the required leakage conditions in regulation 16.7. Clause 7 will enable free vents to be installed while ensuring there are mechanisms in place to minimise a leakage event.

These requirements will make the PCBU responsible for ensuring the tank is designed in a way that minimises the extent of leakage when the tank is upright, on its side, or upside down. If there is an emergency and there is leakage from the tank, the Regulations require the PCBU to put in place an emergency response plan to contain the spill and manage its effects.

CLAUSE 8: FITTINGS IMPACT RESISTANCE

What does clause 8 of the SWI do?

Regulation 16.12 sets requirements for tank fittings below the upper liquid level of a full tank, specifically that if a fitting is damaged, there must be no visible leakage of liquid from the tank.

Clause 8 will modify this to require a PCBU to ensure fittings below the safe fill level on a tank are provided with a shut-off valve that is located as close as reasonably practicable to the tank shell. In addition, it sets out requirements to:

- i. ensure that fittings are properly serviced
- ii. minimise the likelihood that fittings are accidentally damaged or broken off
- iii. control a leakage if fittings are damaged or broken off.

Why are we proposing these modifications?

Bitumen tank wagons cannot meet the requirements in regulation 16.12 because their fittings must be located below the tank's safe fill level to transfer hazardous bituminous substance from the tank.

Clause 8 modifies regulation 16.12 to allow fittings to be placed on bitumen tank wagons as required, while requiring preventative measures to avoid accidental damage.

CLAUSE 9: MAXIMUM COMPARTMENT SIZE

What does clause 9 of the SWI do?

Regulation 16.13(1)(b) of the Regulations sets a maximum compartment size of 10,000L for a tank wagon. Clause 9 will modify this requirement by providing a maximum compartment size of no more than 35,000L for tank wagons with heating capability.

Why are we proposing these modifications?

In general, tank wagons carrying substances other than hazardous bituminous substances are divided into compartments that meet the requirements of regulation 16.13.

However, bitumen tank wagons have a single compartment to accommodate heating equipment and to allow for convection.

In the existing fleet of bitumen tank wagons, single-compartment tanks have a maximum capacity of 35,000L. Baffling is usually built into these tanks to manage the longitudinal surging associated with these greater volumes.

Clause 9 of the SWI will recognise this maximum capacity.

CLAUSE 10: LOSS MINIMISATION WHILE TRANSFERRING LIQUIDS OR GASES

What does clause 10 of the SWI do?

Regulation 16.15(1) to (3) requires a tank to be constructed with at least two independently operating means of shutting off the flow of a liquid from the tank, able to be activated within 10 seconds by the person transferring the liquid. Once activated, they must shut off the flow within three seconds. One must be at the tank wall, and the other must be at the delivery connection.

Clause 10 of the SWI will provide an alternative means of compliance to regulation 16.15(1) to (3). It will require the pipe for transferring hazardous bituminous substance to be designed and constructed with at least two means of shutting off the flow. Each must do so within 20 seconds of being activated. One must be located at the tank wall, while the location of the second is not specified.

Clause 10 will enable a PCBU to comply with the alternative method it specifies or with the existing regulation.

Why are we modifying these requirements?

In the existing bitumen tank wagon fleet, a single valve on the tank wall is used to shut off the flow into and out of the pipes. The valves work more slowly than specified in regulation 16.15(2), but the narrow valve openings minimise potential spillage during the time it takes to close the valve.

Clause 10 will provide an alternative method to regulation 16.15 to allow the use of the valves described above. It will not replace regulation 16.15, because these requirements may be able to be met as new technologies become available.

CLAUSE 11 STABILITY AND MANOEUVRABILITY

What does clause 11 of the SWI do?

Regulation 16.20(1)(a) sets stability and manoeuvrability requirements for tank wagons, to ensure they do not roll over when subject to specified forces, including a static roll threshold (SRT) of 0.45g.

Clause 11 of the SWI will modify this regulation specifically for bitumen tank wagons designed and constructed to spray or apply hazardous bituminous substance onto road surfaces. It will allow these tank wagons to meet the SRT of 0.35g specified in the Land Transport Rule: Vehicle Dimensions and Mass 2016 (the Land Transport Rule).

This clause will be subject to clause 12, which establishes a date by which the existing fleet of bitumen tank wagons must meet the stability and manoeuvrability requirements in the Regulations.

Why are we modifying these requirements?

The SRT in the Regulations is higher than that in the Land Transport Rule due to the different types of hazardous substances carried in tank wagons that are subject to the Regulations.

Tank wagons that spray or apply hazardous bituminous substance have design features that are relevant to determining the SRT. They also carry less hazardous bituminous substance than bulk tank wagons.

Tank wagons that spray or apply hazardous bituminous substance are designed to maximise the volume of bitumen above the heating tubes on the tank floor. This reduces the risk of explosion due to tubes being exposed to vapour in the tank but makes it difficult to meet the SRT in the Regulations.

The SRT calculation does not include the weight of the spray bar and fittings on tank wagons that spray or apply hazardous bituminous substance. As this weight improves the SRT, the SRT calculated for bitumen tank wagons may be conservative.

For the reasons outlined above, the SRT specified in the Land Transport Rule is appropriate for tank wagons that spray or apply hazardous bituminous substance.

CLAUSE 12 STABILITY AND MANOEUVRABILITY REQUIREMENTS FOR CERTAIN EXISTING TANK WAGONS

What does clause 12 of the SWI do?

Regulation 16.20(1)(a) sets requirements for the stability and manoeuvrability of a tank wagon, to ensure it does not roll over when subject to specified forces.

Clause 12 of the SWI will modify this regulation so that bitumen tank wagons in the existing fleet built to a SRT of 0.35g can continue to meet this SRT, provided they:

- were built before the commencement of this SWI
- are not covered by clause 11 above (that is, are not sprayers or applicators)
- have not undergone major works since the commencement of this SWI (that is, a change to, or replacement of, the chassis or bogie of a tank wagon that influences the tank wagon's SRT)
- meet rule 3.15 of the Land Transport Rule.

This clause will remain in effect for eligible tank wagons for 20 years.

Tank wagons covered by this clause will be required to meet all other applicable requirements in the Regulations and the SWI.

Why are we modifying these requirements?

The existing fleet was built before the Regulations came into effect in 2017. They were built to the SRT of 0.35g specified by previous regulations and which remains in the Land Transport Rule.

Much of the current fleet of bitumen tank wagons would need to be replaced or substantially modified to achieve compliance with regulation 16.20(1)(a), despite meeting the other requirements in the Regulations or in the SWI.

Twenty years provides sufficient time for existing bitumen tank wagons to reach the end of their useful life and be replaced with tank wagons built to the current standard.

However, if an existing tank wagon undergoes major works before then, we consider that the PCBU must take that opportunity to carry out any additional works needed to ensure the tank wagon can meet the SRT of 0.45g set in the Regulations.

CLAUSE 13 REAR-END COLLISION PROTECTION

What does clause 13 of the SWI do?

Regulation 16.22(1) sets requirements to ensure a tank wagon is designed to withstand a static load (a constant force) of 0.45g against its rear. When subject to this force, the tank must not leak more than 0.1L of liquid per minute.

Clause 13 of the SWI will provide an alternative by allowing the draw beam of a tank wagon used to spray or apply hazardous bituminous substance onto a road surface, or the loading bucket of a tank wagon that is a loader-refueller, to be considered when determining compliance with the regulation.

The proposal will not modify the amount of static load the tank wagon must withstand, but rather the place where the tank wagon must withstand this static load (the draw beam or bucket).

For a bitumen tank wagon to meet this alternative, its draw beam or bumper will need to extend past the rear of the tank by a minimum of 0.5m and the tank's rear wall must be forward of the rear most point of the tank wagon's wheel rims.

Why are we modifying these requirements?

The proposal recognises the design and construction of tank wagons that spray and apply hazardous bituminous substance and of loader refuellers.

The draw beam (and associated spray equipment) on tank wagons that spray and apply hazardous bituminous substances provides rear-end collision protection in the same way as the bumper required by the Regulations. Loader refuellers are fitted with a large bucket used to refill aircraft, protecting the rear of those tank wagons.

The position of the tank with regards to the draw beam and bumper and rear wheel rims provides additional protection for the tank wagons that opt for this alternative.

CLAUSE 14 REAR RUN-UNDER BY SMALL VEHICLE

What does clause 14 of the SWI do?

Regulation 16.23(1) and (2) set requirements to protect rear run-under by a small vehicle by establishing the amount of static load that a tank wagon must be able to withstand at a determined location on the tank wagon.

Clause 14 of the SWI will provide an alternative means of compliance to regulation 16.23 for tank wagons used to spray or apply a hazardous bituminous substance onto a road surface and for loader refuellers.

The alternative will deem the PCBU to have complied with this regulation if the rear wall of the tank is forward of the rear-most point of the wheel rims on the tank wagon.

Why are we modifying these requirements?

In addition to the fittings on a bitumen tank wagon used to spray or apply hazardous bituminous substance onto a road surface and the bucket on a loader refueller, the wheel rims on these tank wagons provide further protection against rear run-under.

As the tanks holding hazardous bituminous substance on a bitumen tank wagon are mounted forward of the rear wheels, they are protected by the wheel rims.

Additionally, loader refuellers frequently cross rough ground to reach their destination. Rear run-under protection can inhibit this. The alternative means of compliance described in this clause will provide equivalent protection to that described in the regulation.

CLAUSE 15 REQUIREMENTS FOR ISSUE OF PRE-COMMISSIONING COMPLIANCE CERTIFICATES

What does clause 15 of the SWI do?

Regulation 16.34 sets requirements for the issue of a pre-commissioning compliance certificate.

To issue a pre-commissioning certificate under regulation 16.34(4)(a), a compliance certifier must be satisfied that items requiring a pre-commissioning certificate were constructed and installed to a design with a design compliance certificate issued under regulation 16.31.

Clause 15 of the SWI will allow a compliance certifier to issue a pre-commissioning certificate if satisfied that the items in Schedule 24 of the Regulations were constructed and installed to the standard applying to the tank wagon when it was built.

If the compliance certifier is not satisfied of this, this clause will require the PCBU to give WorkSafe a compliance plan for our consideration that sets out:

- the compliance certifier's view of the extent to which each design component was constructed and installed to the standard that applied at the time of its construction

- the information the compliance certifier relied on to form that view, and
- the timeframe in which the design component will be altered to meet the standard.

Clause 15 also states that a PCBU complying with a compliance plan described above before the **due date** does not need a pre-commissioning certificate. The due date will be three years after the commencement date of the SWI.

If WorkSafe declines to approve the plan, the SWI will allow the PCBU to make the amendments needed for WorkSafe to approve it. The PCBU will have 20 working days from the date WorkSafe advises the PCBU of its decision (or any further time that WorkSafe allows) to make the amendments.

Why are we modifying these requirements?

Many existing tank wagons were authorised under a previous regime. They remain in service but may not be able to achieve a pre-commissioning certificate for all the items listed in Schedule 24 of the Regulations.

A design certificate is needed to obtain a pre-commissioning certificate, and many existing tank wagons do not have design certificates, which were not a requirement when they were built.

Due to how long they have been in service, the technical drawings and other specifications for tank wagon components listed in Schedule 24 may no longer be available for design certification under the current Regulations.

In the absence of this evidence, the SWI will allow compliance certifiers authorised to issue certificates for tank wagons to use their expertise and experience to make a judgement about whether the tank wagons were built to the standard that applied at the time they were built.

If components of the tank wagon no longer meet that standard, the compliance plan will provide a mechanism and time for the PCBU to bring them up to this standard.

CLAUSE 16: REQUIREMENTS FOR ISSUE AND RENEWAL OF IN-SERVICE COMPLIANCE CERTIFICATES

What does clause 16 of the SWI do:

Regulation 16.36 sets requirements for issuing and renewing in-service compliance certificates. In-service compliance certificates are issued two years after the manufacture of the tank wagon or the issue of a pre-commissioning certificate.

Clause 16 will modify regulation 16.36(1) to allow the in-service compliance certificate to be issued three years after the issue of the pre-commissioning certificate or manufacture of the tank wagon.

Why are we modifying these requirements?

Industry guidelines for bitumen tank wagons recommend bitumen tank wagons undergo tests and checks every three years, in addition to and complementary to those required by the Regulations.

These tests and checks are undertaken by persons with specific expertise and are likely to be the same people that carry out the checks required by the Regulations.

Aligning the in-service compliance certificate cycle of the Regulations with the industry inspection cycle will mean they can be combined, allowing a thorough examination that reinforces both regulatory requirements and industry best practice.

CLAUSE 17: TRANSFER OF LIQUID OR GAS

What does clause 17 of the SWI do?

Regulation 16.40 requires a worker to ensure:

- a tank wagon does not move from the time the transfer of a hazardous substance commences until it is completed
- before a tank wagon is moved, all tank openings are securely closed after the transfer of hazardous substance is complete.

Clause 17 of the SWI will require the worker to ensure the tank wagon does not move unless it is spraying or applying a hazardous bituminous substance onto a road surface as part of a road sealing process. It will also require the worker to ensure all tank wagons are securely closed after the transfer is complete only, removing the reference to the tank wagon being moved.

Clause 17 will also require the PCBU to ensure a tank wagon that is spraying or applying a hazardous bituminous substance onto a road surface as part of a road sealing process is either:

- under the direct supervision of a competent person (a person who has received information, instruction and training in accordance with regulation 4.5 of the Regulations), or
- incorporated into a mobile chain of in-situ stabilisation equipment.

Why are we modifying these requirements?

Bitumen tank wagons cannot meet the requirements of regulation 16.40 while they spray or apply hazardous bituminous substance onto a road surface. These tank wagons move along the road as they spray or apply the substance to ensure they create a uniform surface.

Tank wagons must either be supervised as this transfer takes place or connected to a stabilisation train. When a stabilisation train is used, it moves the tank wagon along with it, meaning personnel do not need to be on the tank wagon.

Clause 17 will allow this to take place.

CLAUSE 18: MODIFIED REQUIREMENTS FOR PERSONS WITH ACCESS

What does clause 18 of the SWI do?

Regulation 16.45(1) requires a PCBU to ensure no person is in or on the tank wagon except those people necessary for its operation and who carry out maintenance, inspection, training, or management duties.

Clause 18 of the SWI will expand this requirement to include those necessary for the tank wagon's operation **or** the transfer of its contents, in addition to those who carry out maintenance, inspection, training or maintenance duties. It will also make the clause apply so far as is reasonably practicable.

Why are we modifying these requirements?

Bitumen tank wagons travel to isolated places, sometimes requiring them to transport additional staff. These people may be involved in transferring the substance, rather than operating the tank wagon.

There may be other reasons why an additional person is required on the tank wagon, which is why clause 18 requires the requirement to be met 'so far as is reasonably practicable'. If the duty has not been met, the PCBU will have to ensure there is a justification, taking into account the meaning of reasonably practicable in section 22 of HSWA.

Thank you for taking part in this consultation.

Published: June 2022

PO Box 165, Wellington 6140, New Zealand

worksafe.govt.nz



Except for the logos of WorkSafe, this copyright work is licensed under a Creative Commons Attribution-Non-commercial 3.0 NZ licence.

To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc/3.0/nz>

In essence, you are free to copy, communicate and adapt the work for non-commercial purposes, as long as you attribute the work to WorkSafe and abide by the other licence terms.

