

Title	Demonstrate knowledge of sewage plants and systems, and their major components and operation on board ships		
Level	4	Credits	5

Purpose	<p>This unit standard has been developed for personnel responsible for the servicing and maintenance of sewerage plants and systems installed on board ships.</p> <p>People credited with this unit standard are able to demonstrate knowledge of: IMO regulation in relation to the prevention of pollution from ships (MARPOL); the sewage and waste water treatment plants on board ships; safety precautions in relation to sewage treatment plants on board ships; and functions of components and operation of sewage treatment plants on board ships.</p>
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Classification	Mechanical Engineering > Maintenance and Diagnostics in Mechanical Engineering
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Available grade	Achieved
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Explanatory notes

1 References

International Convention for the Prevention of Pollution from Ships (MARPOL)
Adoption: 1973 (Convention), 1978 (1978 Protocol), 1997 (Protocol - Annex VI);
Entry into force: 2 October 1983 (Annexes I and II). Available from International Maritime Organization (IMO) on:

[http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx)

Safe Working in a Confined Space. Available at:

<http://www.osh.dol.govt.nz/order/catalogue/pdf/confined.pdf>

AS/NZS 2865:2001 *Safe working in a confined space*.

2 Definitions

Industry standards and recommended practices are those set in place by the Maritime Industry.

Ships regulations refers to the written instructions/manuals on board a ship and may relate to – personnel safety, precautions, processes and procedures, operation of plants and systems, disaster management, rules and regulations, operating instructions, maintenance procedures, record keeping, reporting, standards, handling and disposal of toxic and hazardous substances, prevention of pollution.

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of IMO regulation in relation to the prevention of pollution from ships (MARPOL).

Evidence requirements

- 1.1 The IMO regulation in relation to the prevention of pollution from ships (MARPOL) is explained.
- 1.2 The need for sewage and waste water treatment is explained in accordance with MARPOL.
- 1.3 The difference between terms black water and grey water waste is explained and their sources listed.
- Range evidence of four sources of black water and eight sources of grey water is required.

Outcome 2

Demonstrate knowledge of the sewage and waste water treatment plants on board ships.

Evidence requirements

- 2.1 Two types of sewage treatment plants used on board ships are described.
- Range biological, electro-chemical.
- 2.2 The operation of the biological sewage treatment plant is explained by describing the functions of its three main stages.
- Range three stages: aeration, settlement, disinfection.
- 2.3 The operation of the electrochemical sewage plant and its advantages over the biological treatment system is explained.
- 2.4 The purpose and operation of the black water system is described highlighting all principal components of the system.
- 2.5 The purpose and operation of the grey water system is described highlighting all principal components of the system.
- 2.6 The reason for the installation of grease traps and their locations are explained.
- 2.7 Reasons for not flushing detergent or disinfectant down the toilets on ships are given in accordance with the ships regulations and industry standards.

Outcome 3

Demonstrate knowledge of safety precautions in relation to sewage treatment plants on board ships.

Evidence requirements

- 3.1 The “*working in confined spaces*” regulation in relation to the precautions to be observed when entering sewage treatment plant compartment is explained in accordance with AS/NZS 2865.
- 3.2 Hazards associated with sewage treatment plants on ships are described in accordance with the ships regulations and industry standards.
- Range toxic hazards of gases produced, asphyxiating hazards of oxygen deficiency, flammable and explosive gasses, hazards from treatment chemicals, biological hazards from contact with sewage, mechanical machinery and equipment, electrical.
- 3.3 Pre-entry routines prior to entering compartments containing sewage treatment plant are explained in accordance with the ships regulation.
- 3.4 The terms “personal protection” and “gas detectors” in relation to potential hazards and safety on ships are explained.

Outcome 4

Demonstrate knowledge of functions of components and operation of sewage treatment plants on board ships.

Evidence requirements

- 4.1 The functions of the components of a sewage treatment unit are described.
- Range surge tanks, effluent tank, electro-catalytic book cell, air ejector, dole flow control valve, macerator pump, discharge overboard pump, seawater system, shore discharge, system alarms.
- 4.2 The functions of components of a sewage vacuum collection unit (SVCU) are described.
- Range collection tank, centrifugal ejector pump, ejector, motor operated discharge valve, control panel associated level and pressure switches, check valve.
- 4.3 The operation of a sewage treatment unit is explained.
- 4.4 The operation of a sewage vacuum collection unit (SVCU) is explained.
- 4.5 Describe the routine maintenance tasks for a sewage treatment plant in accordance with the ships regulations and industry standards.

Planned review date	31 December 2017
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	14 December 2012	N/A

Consent and Moderation Requirements (CMR) reference	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.