

# CHEMICAL TANKERS: ‘STANDARD TANK CLEANING PROCEDURES’ AND ‘CLEANLINESS STANDARDS’

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## INTRODUCTION

Chemical tankers transport a wide variety of chemical types. The risks of cargo admixture due to leaking cross over valves or last cargo tank residue contamination due to inadequate pre-load cleaning therefore always exist. This Risk Bulletin focuses on the cargo tank cleaning and associated tank cleanliness risk which will be reviewed within the context of the following issues:

- Adherence to current standard cleaning procedures and tank cleaning guidelines together with the INTERTANKO tank cleanliness standards.
- Compliance with MARPOL Annex II, the IBC Code (SOLAS Chap. 7) the MLC and the ISM Code (SOLAS Chap. 9) during the tank cleaning process.

- Observance of MMIA's tank cleaning warranty and the P&I insurance obligation to adhere to 'standard tank cleaning procedures'.

## BACKGROUND TO CHEMICAL TANK CLEANLINESS AND CLEANING STANDARDS

Tank cleanliness standards and tank cleaning procedures standards are closely related but they are not the same thing. In brief, cleanliness standards specify the goal which must be attained through the selection and application of the appropriate cleaning standards. This relationship and the four steps required to meet cleanliness obligations are explained in more detail in [MM Risk Bulletin No. 36](#).

## CHEMICAL TANKER TANK CLEANLINESS STANDARDS

The INTERTANKO publication [Cargo Tank Cleanliness Standards for Chemical Tankers, Ed. 2017](#) may be viewed as an international industry standard for assessing tank cleanliness. The INTERTANKO cleanliness standards range from the basic Standard No. 1, 'Visually Clean Standard', through to the highest Standard No. 4, 'Ultra-High Purity Standard', as required for chemical cargoes more sensitive than methanol.

The tank pre-load cleanliness INTERTANKO standard selected and the manner in which this is to be assessed by inspection and testing will depend upon the nature of the 'last' cargo, 'next' cargo and the stated requirements of the shipper and or charterer. Standard 1 requires visual inspection only, Standard 2 requires inspection and optional testing while Standards 3 and 4 require both inspection and testing. The testing referred to is conducted by what is known as 'Wall Washing' (WWM) or Wash Water (WW) processes and analysis. These processes are both well described in the INTERTANKO publication. A well-known standard and methodology for the WWM process is prescribed by [ASTM E2664-16](#), and is available from ASTM International .

## CHEMICAL TANKER STANDARD TANK CLEANING PROCEDURES & TANK CLEANING GUIDES

Presently, there are no internationally agreed standard tank cleaning procedures which are specific to the chemical trades. However, comprehensive cleaning guides have been developed by the 'chemical majors' and 'independent experts. These two types of tank cleaning procedures/guides, which are both

based on a 'last' and 'next' cargo colour coded matrix, are explained below. Their content and availability are described below:

## 'CHEMICAL MAJOR' STANDARD TANK CLEANING PROCEDURES

The term 'chemical majors' includes chemical manufacturers, the owners and/or operators of large chemical tanker fleets and their ships managers have created detailed chemical tank cleaning procedures. Examples include Stolt Nielsen, as chemical tanker owners/operators, and OSM, as ship managers. Due to copyright reasons, full copies of these procedures are not readily available for comparison with the content of the independent guides referred to below. However, there appear to be close similarities.

## INDEPENDENT CHEMICAL TANK CLEANING GUIDES

The Independent Guides are well respected and can be considered as representing 'industry best practice'. Two of the most frequently cited Guides are:

- [Dr. Verwey's Tank Cleaning Guide, 10th Ed. 2019.](#)
  - Published by Witherby in hard copy or E-format at a cost of GBP 375.00.
  - Advertised as providing cleaning guidelines for more than 400 bulk liquid cargoes (inclusive of petroleum, chemical and vegetable oil products) and a cleaning matrix of "some 140,000 combinations of 'last' to 'next' cargo".
- [Miracle Tank Cleaning Guide and Cargo Database.](#)
  - Published and updated continuously by ChemServe GmbH. Available as an interactive software product only at a cost of about USD 900.00.
  - Cleaning guidelines extend to about 9,000 petroleum, chemical and vegetable oil products which is supported by a cleaning matrix.

## CHEMICAL TANK CLEANING REGULATORY COMPLIANCE

Space does not permit a detailed review of the IMO and flag state regulatory obligations applicable to Chemical Tankers and tank cleaning. The bulleted outline which follows is therefore intended to highlight the sources of the regulatory compliance required throughout the entire tank cleaning process.

- **MARPOL Annex II** – Provides the Regulations for the Control of Pollution by Noxious Liquid Substances (NLS) in Bulk. They are applicable to all tankers carrying NLS which are 150 GT or over, whether engaged in international or domestic trade.

NOTE 1. Members should refer to the IMO Publication, MARPOL Consolidated Ed. 2017 as updated by the MARPOL Supplement of 2020.

NOTE 2: Res. [MEPC.315\(74\)](#) further amends Annex II and sets out the requirements to pre-wash vegetable oil tanks after discharge at European ports. It comes into force on 1 Jan 2021.

Annex II includes:

- Categorization of NLS into Cat. X 'major hazard', Cat Y 'hazard', Cat Z 'minor hazard');
  - Surveys and certification;
  - Chemical tanker design and equipment;
  - Restrictions on the discharge of NLS tank washings, inclusive of the prohibition of the use and discharge of any cleaning chemicals not listed in the [IMO Provisional Categorization of Liquid Substances MEPC.2/Circ.15, Annex 10](#).
  - Obligation to provide a Procedures and Arrangements (P&A) Manual in a standard format and endorsed by flag state
- **IBC Code** – Provides the detail for the SOLAS and MARPOL requirements for the safe carriage of NLS in bulk by prescribing the standards for the design, construction, equipment and operation of chemical tankers.

NOTE: Members should refer to the IMO Publication IBC Code 2020 Ed. which incorporates the latest IMO amendments Res. [MEPC.318\(74\)](#) and [MSC.460 \(101\)](#).

The IBC Code includes:

- Defining the 3 chemical tanker Types, being:
  - **Type 1** – Certified to carry products with very severe environmental and safety hazards which require maximum preventive measures to preclude an escape of such cargo.

- **Type 2** – Certified to carry products with appreciably severe environmental and safety hazards which require significant preventive measures to preclude an escape of such cargo.
- **Type 3** – Certified to carry products with sufficiently severe environmental and safety hazards which require a moderate degree of containment to increase survival capability in a damaged condition.
- Requiring a Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk (COF Certificate) and International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk (NLS Certificate).
- Safety requirements for the protection of personnel;
- Operational requirements inclusive of personnel training;
- Additional measures inclusive of the requirement for a flag state approved Procedures and Arrangements (P&A) manual:
- Table of over 250 NLS chemicals specifying on which chemical tanker Type 1, 2 or 3 these NLS may be carried, the UN Dangerous Goods Number, and any special handling requirements;
- Table listing the substances which do NOT fall within the scope of The IBC Code (e.g. alcohol and vegetable oils).
- **SOLAS and MLC** – Provide the obligation to provide safe working practices on board inclusive of safe entry and work by the crew in the cleaning of cargo tanks.

NOTE 1: Reference should be made to MM's Risk Bulletin on the UK MCA's Code of Safe Working Practices (COWSP), a publication long recognised as providing best practice standards for crew safety.

NOTE 2: The industry accepted best practice guide to safety on board Chemical Tankers is the ICS Tanker Safety Guide (Chemicals). The 5<sup>th</sup>. Ed. of this guide, published as a hard copy or e-book will be available from 1 Jan 2021.

- **ISM Code** (SOLAS Chap. 9) – which requires that all shipboard operational procedures (including chemical tank cleaning) are detailed and kept updated in the SMS manual, inclusive of specific references to applicable regulation, industry best practice and, logically, the IBC Code P&A Manual referred to above.

## MMIA STANDARD TANK CLEANING PROCEDURES WARRANTY

The MMIA P&I terms of entry for a Chemical Tanker will normally include the following tank cleaning warranty:

*“Warranted vessel to comply with the standard tank cleaning procedures and the use of appropriate cleaning agents in respect of loading of different grade of cargoes and/or product. Otherwise the Association reserves the right to reject in whole or in part, any claims arising therefrom”.*

A question sometimes raised by members is whether the words ‘the standard tank cleaning procedures’ refer to the cleaning procedures already contained in their vessel’s operating manual and/or the approved ISM Code Manual (or NCVS equivalent) procedures or whether these words may refer to compliance with an external set of industry tank cleaning procedures?

As discussed above, there are – as yet – no internationally agreed ‘standard tank cleaning procedures’ for chemical tankers. However, ‘chemical major’ and independent guidelines are readily available which can be considered as representing current ‘industry best practice’ for tank cleaning in the chemical trades. These cleaning guidelines and the INTERTANKO Tank Cleanliness Standards should be adhered to as explained below.

## CONCLUSION AND TAKEAWAY

To meet the requirements of shippers and/or charterers and the MM tank cleaning warranty and optimise their P&I cover, Chemical Tanker Members should ensure that:

- i. If time chartered in by a chemical major or similar organisation, tank cleaning is accomplished to the charterer’s own specified cleaning guidelines which should preferably be to the same standard or higher than the Dr Verwey’s or Miracle Tank Cleaning Guide.
- ii. If not time chartered in by an oil major or similar organisation, tank cleaning is accomplished in accordance with the Dr Verwey’s or Miracle Guides together with any special tank cleaning procedures specified by the shipper and/or voyage charterer.
- iii. Whether time chartered in or not, tank cleanliness standards are agreed well in advance of pre-loading tank inspection and preferably by reference to the INTERTANKO Cargo Tank Cleanliness Standards.

MMIA's recommendations Chemical Tanker Members are as follows:

1. Ensure that a copy of this Risk Bulletin, together a copy of the INTERTANKO Tank Cleanliness Standards, are provided to all Chemical Tanker master's in your fleet and to your ship managers.
2. Instruct your ship managers and DPA to check the content of Chemical Tanker Operating Manuals and/or IBC Code P&A Manuals and/or ISM Code or NCVS equivalent SMS Procedures to ensure they include specific reference to:
  - a. The Dr Verwey's or Miracle Guide and the necessity for their application when cleaning cargo tanks for a chemical cargo product or grade change.
  - b. INTERTANKO Cargo Tank Cleanliness Standards as a clear and unambiguous tank cleanliness benchmark.
  - c. Compliance with flag state regulations relating to tank cleaning and associated MARPOL, MLC and SOLAS obligations or NCVS equivalents.
3. Shippers and/or Charterers should be requested to provide the full details of all tank cleaning and cleanliness requirements, preferably by reference to the Dr Verwey's or Miracle Guides or their own 'chemical major' tank cleaning guidelines and the INTERTANKO Cargo Tank Cleanliness Standards.