Hydrocarbon management

HM 50

Guidelines for the cleaning of tanks and lines for marine tank vessels carrying petroleum and refined products

4th edition

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HM 50 GUIDELINES FOR THE CLEANING OF TANKS AND LINES FOR MARINE TANK VESSELS CARRYING PETROLEUM AND REFINED PRODUCTS

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The EI's purpose is to develop and disseminate knowledge, skills and good practice towards a safe, secure and sustainable energy system. In fulfilling this mission, the EI addresses the depth and breadth of the energy sector, from fuels and fuels distribution to health and safety, sustainability and the environment. It also informs policy by providing a platform for debate and scientifically-sound information on energy issues.

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It also offers its own Chartered Energy Engineer, Chartered Petroleum Engineer and Chartered Energy Manager titles.

A registered charity, the EI serves society with independence, professionalism and a wealth of expertise in all energy matters.

This publication has been produced as a result of work carried out within the Technical Team of the EI, funded by the EI's Technical Partners. The EI's Technical Work Programme provides industry with cost-effective, value-adding knowledge on key current and future issues affecting those operating in the energy sector, both in the UK and internationally.

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CONTENTS

Page

Foreword **3**

Acknowledgements **4**

1 Introduction and scope **5**

2 Tank cleaning guidelines **6**
2.1 General information 6
2.1.1 Introduction and cleanliness standards 6
2.1.2 Inert gas 6
2.1.3 Static electricity 6
2.2 Bottom and line flushing 7
2.2.1 General 7
2.2.2 Fuel oil cargoes 7
2.3 Elimination of water for critical cargoes 7
2.4 Disposal of residues 8
2.4.1 Cargo residues 8
2.4.2 Scale and solid residues 8
2.5 Tank washing 9
2.5.1 General 9
2.5.2 After black oil cargoes 9
2.5.3 After white oil/clean product cargoes 10
2.5.4 After crude oil cargoes 10
2.5.5 After vegetable oil cargoes 10
2.5.6 After fatty acid methyl ester (FAME) or blended biodiesel cargoes 11
2.5.7 After gasoline/ethanol blended cargoes 11
2.5.8 Use of chemicals 11
2.5.9 Cleaning of sampling equipment and stilling wells 12
2.6 Tank inspections 12
2.6.1 General 12
2.6.2 Inerted tanks 12
2.7 Heating coils 12
2.7.1 Testing 12
2.7.2 Heating coils made from copper-containing alloys 13
2.8 Tank coatings 13
2.8.1 Temperature restrictions 13
2.8.2 Coating compatibility 13
2.8.3 Stainless steel 14
2.8.4 Coating condition 14
2.9 Cargo lines 14
2.9.1 General 14
2.9.2 Cargo compatibility 14
2.9.3 Testing of cargo lines and valves 15
2.10 Tank cleaning 15
2.11 Comments on individual cargoes (cargo types) 16

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Full document details: HM 50 Guidelines for the cleaning of tanks and lines for marine tank vessels carrying petroleum and refined products

Contents continued

Page

2.11.1 Naphthas and light distillate feedstocks (and/or – clean condensate feedstocks, straight run benzene, pentane, natural gasoline, straight run gasoline) . . . 16
2.11.2 Aviation gasoline (and/or – avgas, aviation spirit) and aviation turbine gasoline, wide cut jet fuel, JP4, Jet B) . . . 16
2.11.3 Leaded motor gasoline (and/or - premium/regular motor spirit, motor gasoline, mogas) . . . 17
2.11.4 Unleaded motor gasoline (and/or – unleaded motor spirit, regular unleaded, premium unleaded, super unleaded, toluene, methyl tertiary butyl ether (MTBE), reformate, alkylate, cracked spirit, ethanol,motor spirit/gasoline blending components) . . . 17
2.11.5 Ultra low sulfur gasolines . . . 17
2.11.6 Solvents (and/or – special boiling point solvents, rubber solvent, unleaded cleaning spirit, white spirit) . . . 18
2.11.7 Aviation jet fuel (and/or – aviation kerosene, dual purpose kerosene, Jet, Jet-A1, Avtur, ATK, JP5, JP8, synthetic jet fuel) . . . 18
2.11.8 Premium and regular kerosenes (and/or – kerosene feedstock, burning oil, stove oil automotive diesel oil, DERV, extra light fuel oil, distillate marine diesel . . . 19
2.11.9 Gas oil and automotive diesel fuel (and/or - automotive gas oil, automotive diesel oil, DERV, extra light fuel oil, distillate marine diesel) . . . 19
2.11.10 Ultra low sulfur automotive diesel fuel (and/or – ULSD, ULS turbine gas oil, LS marine gas oil, ULS diesel) . . . 20
2.11.11 Crude oil and condensate . . . 20
2.11.12 Base lubricating oils . . . 21
2.11.13 Vacuum gas oil (and/or – cracker feed, waxy distillate) . . . 21
2.11.14 Medium and heavy fuel oils . . . 21
2.11.15 Low sulfur fuel oil (and/or – low sulfur atmospheric residue (LSAR), low sulfur waxy residue (LSWR)) . . . 21
2.11.16 Light fuel oil . . . 21
2.11.17 Gas to liquids (GTL) products . . . 22
2.11.18 FAME and blended biodiesel . . . 22
2.11.19 Light cycle oil (LCO) . . . 22

Table 1 Cleaning recommendations . . . 23

Annexes

Annex A Glossary of terms . . . 25

Annex B References . . . 28

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FOREWORD

The Energy Institute (EI) Hydrocarbon Management Committee is responsible for the production and maintenance of standards and guidelines covering various aspects of static and dynamic measurement of petroleum. The Hydrocarbon Management Subcommittee 4 (HMC-4) deals primarily with the measurement and loss of crude oil and oil products, focusing in particular on transport in the marine environment.

HMC-4 is made up of experts from the oil industry, cargo inspectors, ship owners and representatives from marine terminals. It is a truly international panel with representatives from most Western European countries, the Middle East, Far East and North and South America. Equipment manufacturers and experts with specific knowledge of measurement techniques are regularly invited to present papers to the committee.

The EI maintains liaison with parallel working groups of the American Petroleum Institute's Committee on Petroleum Measurement, and other organisations concerned with quantitative measurement in other countries and in other industries. The API are permanent invitees to meetings of the HMC-4 committee.

The EI Hydrocarbon Management guidelines (formerly Petroleum Measurement Manual and Petroleum Measurement papers) are widely used by the petroleum industry and have received recognition in many countries by consumers and the authorities. In order to promote international good practice the EI works via the British Standards Institute to develop standards through the International Standards Organization's technical committee TC-28 Petroleum Products and related products of synthetic or biological origin and its subcommittee TC28/SC2 Measurement of petroleum and related products.

A full list of Hydrocarbon Management guidelines is available on request from the EI. The EI Hydrocarbon Management guidelines are recommended for general adoption but should be read and interpreted in conjunction with safety, environmental, weights and measures, customs and excise and other regulations in force in the particular country in which they are to be applied. Such regulatory requirements have precedence over corresponding clauses in the EI document except where the requirements of the latter are more rigorous, when its use is recommended. Users should also consider contractual constraints imposed by charterers, cargo owners, ship owners and any other interested party.

Although it is believed that adoption of the recommendations of this guideline will assist the user, the EI cannot accept any responsibility, of whatsoever kind, for damage or alleged damage arising or otherwise occurring on vessels or in or about premises where this document has been applied, as final responsibility for adequate preparation of the vessel to receive a cargo lies with the parties controlling this task.

Users of these guidelines are invited to send comments, suggestions, or details of relevant experience to:

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1 INTRODUCTION AND SCOPE

This publication has been compiled with the aim of sharing the experiences of oil companies and other bodies represented on the HMC-4 with other branches of the oil industry, by providing guidance with regard to cleaning and washing of tanks on board petroleum tank vessels, particularly when carrying refined products and changing from one product to another.

Although the guidelines are written principally for sea-going ships they may also be applied to inland barges.

This document addresses issues relating to most classes of refined product but does not cover chemicals or gases.

Guidelines for crude oil washing are contained in HM 40 *Guidelines for the crude oil washing of ships' tanks and the heating of crude oil being transported by sea*, published by the EI.

Instructions regarding washing are normally issued by the charterers or vessel owners either in the form of a specific instruction or a general tank cleaning guideline provided on board. This publication is intended to provide additional guidance to those involved with issuing such instructions and to other parties who may be involved in confirming that suitable procedures have been followed.

This publication has been prepared primarily with the aim of maintaining product quality through the use of minimum effective tank washing procedures.

Further information relating to handling and quality of aviation fuels can be found in EI/ JIG 1530 *Quality assurance requirements for the manufacture, storage and distribution of aviation fuels to airports*.

Safety and environmental issues are paramount in the operations described and for detailed guidance on these issues the latest revisions of ISGOTT, ISGINTT, MARPOL and SOLAS regulations should be referred to and will take precedence over any recommendations made here.

Nothing in the guidance contained in these guidelines suggests or encourages deviation from the carriage and cleaning requirements required by MARPOL Annex II Noxious Liquid Substance (NLS) regulations. MARPOL Annex II elevates the carriage and cleaning standards for specific cargoes. The cleaning standards, carriage requirements and slop disposal provisions of MARPOL are developed to protect the environment, not necessarily to prepare a tank for the next cargo. Products addressed in these guidelines to which Annex II NLS regulations may apply include but are not limited to: biodiesels, lube additives, toluene, methanol, MTBE, all vegetable oils, and many gasoline blending components.

This fourth edition has dispensed with previous Tables 1, 2, and 3, moving their content into the main text. The cleaning table, now Table 1, has been significantly revised. The recommendations acknowledge that enhanced stripping and drying may be an acceptable alternative to mopping. Some comments on inert gas systems were considered out of scope and have been removed.

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2 TANK CLEANING GUIDELINES

2.1 GENERAL INFORMATION

2.1.1 Introduction and cleanliness standards

Tank cleaning is carried out to:

- Prepare tanks for the carriage of the next cargo.
- Prevent the build-up of oily residues.
- Facilitate gas-freeing and tank entry for repairs/tank mopping.
- Comply with charter party requirements.
- Comply with MARPOL regulations.
- In extreme circumstances, prepare tanks for the carriage of clean ballast.

It can be accomplished by means of portable or fixed tank washing machines, or sometimes a combination of both using hot, cold, fresh or sea water and/or tank cleaning chemicals singly or in combination.

In order to reduce unnecessary bunker consumption, impact on the environment and associated costs, vessels should only tank clean when necessary. Also, introducing water into the cargo system is not always the best action as it can increase contamination if tanks and lines are not properly cleared.

Cargo tanks should be cleaned to the standard necessary to meet the requirements for the next cargo or, where applicable, for clean ballast or for tank-entry and repairs. The tank cleaning Table 1 is to be used as a guide to the degree of cleaning necessary between cargoes.

Depending on the intended use of the product concerned, the standard of cleanliness required by some charterers/receivers may be different from that found within these guidelines. It is therefore extremely important to ensure that cleaning recommendations are provided in writing. Any deviations from recommendations should be confirmed in writing.

2.1.2 Inert gas

The inert gas system, where fitted, should be operated appropriately during tank washing, gas-freeing and tank preparation operations. Additional safety precautions should be taken for vessels which do not have inert gas systems, although the tank washing recommendations provided in this document still apply. Safety recommendations contained in ISGOTT should be followed.

Inert gas systems and scrubbers which are not operated correctly or are poorly maintained can result in cargo contamination with water, soot, SO_2 or SO_3. For aviation jet fuel cargo this can lead to filtration issues and reduce the effectiveness of static dissipators.

2.1.3 Static electricity

Precautions to prevent static discharge during washing operations should be followed at all times. These are detailed in ISGOTT.

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Particularly hazardous conditions may exist when washing under non-inert conditions or when using hot water wash which can increase the temperature of cargo residues closer to their flashpoint.

2.2 BOTTOM AND LINE FLUSHING

2.2.1 General

It may be acceptable to flush the tank bottoms with the next grade to be loaded. This flushing medium is normally then discharged ashore or segregated on board. Discharges to shore can only take place after discussion with all parties involved. There will be costs associated with this procedure (in particular the flushing medium), and all parties will need to agree to these costs and how they are to be met.

Flushing pumps and lines using water can only be considered when suitable reception facilities are available ashore or where washings can be pumped to a suitable slops tank. On completion, all lines and pumps should be well drained, but the practice of draining to the pump room bilge should be avoided.

2.2.2 Fuel oil cargoes

When changing from a higher quality product to a lower quality product (e.g. low to high sulfur), it may be possible, under certain circumstances, to reduce the tank preparation procedures. In these cases, the ROB should still be minimised.

Provided that any contamination would not adversely alter the quality of the cargo to be loaded, then load on top may be possible. However, this matter should always be clarified with, and agreed to by, all interested parties. Where uncertainty exists, the tank washing guidelines should be followed.

When loading vacuum gas oil/waxy distillate or other feedstock products, it will be necessary to remove salt residues from any tank which has previously contained salt water ballast or has been cleaned using salt water (see Table 1), typically using a fresh water rinse.

2.3 ELIMINATION OF WATER FOR CRITICAL CARGOES

When it is necessary to mop tanks dry for critical cargoes such as aviation kerosene, lubricating oil, or FAME, care should be taken to achieve a compatible standard of preparation throughout that portion of the cargo system allocated to the critical product. The following procedures should be followed:

The cargo lines which are to load and discharge the critical product should be opened and well drained. This includes manifolds, drop lines, pump discharge lines and tank suction lines.

Cargo pumps and their associated air vessels, strainers and bypasses should be opened and well drained. This is to include any vacuum breakers.

Individual tank suction valves should be opened and remain open during the mopping process. Valve inspection covers should be opened as necessary.

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