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OIL COMPANIES INTERNATIONAL MARINE FORUM

**GUIDELINES ON SAFETY MANAGEMENT
SYSTEMS FOR HOT WORK AND ENTRY INTO
ENCLOSED SPACES**

The OCIMF mission is to be the foremost authority on the safe and environmentally responsible operation of oil tankers and terminals, promoting continuous improvement in standards of design and operation.

The Oil Companies International Marine Forum (OCIMF) is a voluntary association of oil companies having an interest in the shipment and terminalling of crude oil and oil products. OCIMF is organised to represent its members before, and consult with, the International Maritime Organization (IMO) and other government bodies on matters relating to the shipment and terminalling of crude oil and oil products, including marine pollution and safety.

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Introduction

Casualties involving Hot Work and Entry into Enclosed Spaces continue to occur, resulting in avoidable loss of life and damage to property. ISGOTT Fifth Edition provides detailed guidance on both topics but assumes that this guidance will be underpinned by an “effective” Safety Management System (SMS). OCIMF has carried out an informal survey of some OCIMF Members, and representative Companies within the industry. This shows that while there may be divergences of opinion on what constitutes an “effective” SMS for Hot Work and for Entry into Enclosed Spaces, those which embrace the spirit as well as the letter of ISGOTT have certain characteristics in common to ensure that the stated objectives are achieved. This Paper has been prepared by the Oil Companies International Marine Forum to heighten awareness of the safety issues and to set out what OCIMF believes to be current industry best practice. The guidance is presented in the form of a list of basic principles which OCIMF believes ship operators should consider when developing specific on-board procedures to suit their operational needs. It should be emphasised that this Paper is not proposing any measures which are not currently being implemented as part of industry best practices. It seeks only to reinforce what many ship operators are doing already and effectively support the implementation of ISGOTT 5.

1. Definitions.

Safety Management System (SMS): A structured and documented system enabling Company personnel to implement effectively the Company safety and environmental protection policy. (ISM Code Part A Regulation 1.1.4).

Hot Work: Work involving sources of ignition or temperatures sufficiently high to cause the ignition of a flammable gas mixture. This includes any work requiring the use of welding, burning or soldering equipment, blow torches, some power driven tools, portable electrical equipment which is not intrinsically safe or contained within an approved explosion-proof housing, and internal combustion engines. (ISGOTT).

Hot Work Permit: A document issued by a Responsible Person permitting specific Hot Work to be done during a particular time interval in a defined area. (ISGOTT).

Enclosed Space: A space that has limited openings for entry and exit, unfavourable natural ventilation, and that is not designed for continuous worker occupancy.

This includes cargo spaces, double bottoms, fuel tanks, ballast tanks, pump rooms, cofferdams, void spaces, duct keels, inter-barrier spaces, engine crank cases and sewage tanks. (ISGOTT)

In recognising the risk of serious injuries and fatalities associated with maintenance or repair work to ships' lifts / elevators it is recommended that this maintenance or repair work is aligned to a rigorous isolation procedure and that lift shafts / elevator trunkings are also included in such list of enclosed spaces.

Entry Permit: A document issued by a Responsible Person allowing entry into a space or compartment during a specific time interval. (ISGOTT).

2. Principles for an Effective Safety Management System for the Control of Hot Work.

2.1 General: The following guidance is intended to supplement not replace the guidance given in ISGOTT Fifth Edition Chapter 9.

The SMS should ensure that: -

- (i) Any Hot Work to be carried out is necessary for:-
 - (a) the safety, and / or,
 - (b) the immediate operation of the ship, andthat **all** viable alternatives have been considered and reasons for rejection are documented
- (ii) Full consideration has been given to performing the Hot Work in a designated space such as the engine room workshop where conditions are deemed safe.
- (iii) Full consideration has been given to **all** hazards associated with the Hot Work process, as identified within a formalised Risk

Assessment, including but not limited to: personal safety, including protection from burns and eye damage; heat exhaustion, ventilation and the maintenance of a safe atmosphere, heat transmission and the electrical integrity of welding equipment.

- 2.2 Pre – agreement:** The requirement for Hot Work outside the designated space should be agreed between the Shipboard Management Team and the Company (office). The discussion may include: evaluation of alternatives (including Cold Work), duration of job, scheduling, ship’s staff and/or contractors, materials and logistics, stability and stress and weather forecasts.

The SMS should incorporate the following broad principles:-

- (i) The ship to provide sufficient information for the Company to make a considered judgement on the proposals and in particular to review, challenge and approve the risk assessment carried out by the ship.. The level of approval from the Office must be documented in the SMS. The Master / Chief Engineer and the Office must be in agreement prior to commencement of hot work. Information provided by the ship should include but may not be limited to:_

- Location and access arrangements;
- Scope of work to be carried out;

Note: Normally only one work site will be considered at a time. Exceptions can be considered on a case by case basis.

- Disposition of all tanks, spaces and other potential sources of fire and explosion including pipelines;
- Precautions to be taken to protect the Hot Work location;
- Method of ensuring continuous ventilation of the work location;
- Precautions to be taken to ensure effective fire protection at the work site and adjacent spaces;
- Experience and competence of personnel involved;
- Equipment to be used.
- If within Port Limits, has the port authority been informed.

- (ii) Company approval process should include input from both technical management and HSE departments.

- (iii) Presence of shore based Company representatives on board the vessel should not exonerate the shipboard management team from complying with the approval process described in (ii) above.

2.3 Permits: The SMS should require that:

- (i) A Hot Work permit is normally completed for every Hot Work operation that is carried out. If multiple jobs are being carried out in a particular area then the issuing of a single permit should take in to consideration available

resources to control the risks and the number of jobs to be concurrently undertaken.

(ii) The maximum validity of the Hot Work permit is stated (normally not to exceed 12 hours) and any time limits applicable to the work which it authorises. If work is scheduled to take longer than the stated maximum then the SMS should require that working conditions are reassessed before the issue of a continuation permit.

(iii) The responsibilities of those overseeing and those carrying out the work are clearly set out.

(iv) A copy of the Permit is displayed at the work site.

(v) Permit to be invalidated and require a new Risk Assessment whenever there is a change to any conditions within the original Risk Assessment

(vi) The Ship is to notify the Company of the positive start and conclusion of the work.

(vii) Where no enclosed space permit is applicable then repetitive gas tests are carried out at as specified in the SMS and the results recorded by the Responsible Officer.

3. Principles for an Effective Safety Management System for the Control of Entry into Enclosed Spaces

3.1 General: The following guidance is intended to supplement not replace the guidance given in ISGOTT Fifth Edition Chapter 10.

The atmosphere of any enclosed or confined space is potentially dangerous. The space may be deficient in oxygen and/or contain flammable or toxic fumes, gases or vapours. Whenever possible, alternative means of working which avoid entering the space should be identified.

3.2 List of principles for Entry into Enclosed Spaces: The SMS should consider the following:-

(i) That best practice examples consistently show the benefit of Single Permit use for individual spaces. However, in certain limited cases it might be appropriate to utilise a single permit covering multiple enclosed spaces. In such cases then the Safety Management System must ensure an equivalency of Risk Management afforded by a Single Permit. In particular the adequacy of:

(a) Resources (including stand-by / rescue personnel and equipment) to be available for immediate use at the entrance to each space

and

(b) Controls(including effective communications between the Responsible Officer and personnel within the space)

should be as fully described within Section 10.5 of ISGOTT.

- (ii) A Responsible Officer is to be designated as the permit holder and the SMS is to contain procedures for a change of permit holder.
- (iii) Entry restricted to one enclosed space at a time. If it is necessary to enter two or more spaces simultaneously then sufficient resources – people, emergency / rescue equipment, gas monitoring equipment etc. – must be available
- (iv) Irrespective of the number of spaces being entered, each space to have its own designated stand-by person i.e. one person per space, in constant attendance in the immediate vicinity of the entrance and in direct contact with the Responsible Officer. The role of the designated person at the entrance to the enclosed space is important in order to conduct the last check prior to entry and ensure that:
 - entry is restricted to personnel who have signed the Permit, or an Attachment to the Permit, thus recording the names of the individuals within the enclosed space
 - personnel entering the Enclosed Space have the appropriate PPE including gas monitors
 - the tank is being ventilated
- (v) The Responsible Officer is to ensure that a record of all persons entering and leaving the space, as reported by the stand-by person, is maintained.
- (vi) The maximum period of validity of the permit is normally not to exceed 12 hours.
- (vii) Permits to specify which gases are to be tested for, but as a minimum should include O₂, HC and toxic gases, prior to and during entry and which equipment is to be used.
- (viii) Repetitive tests to be carried out as specified in the SMS and the results recorded by the Responsible Officer. Best practice is to carry out repetitive tests at periods of not more than two hours while personnel are within the space.
- (ix) Ventilation of the space(s) to be continuous throughout occupancy and during breaks.
- (x) Each person entering an enclosed space to have his/her own personal gas monitor measuring HC, Oxygen, H₂S & CO levels. If this is not possible due to the number of people involved (riding gangs e.g.) then personal gas monitors should be issued to a representative number and personal monitoring should be supplemented by area monitoring within compartments of the space. The alarms on the personal gas monitor must be set in accordance with

Company's instructions. On hearing the alarm, personnel must vacate the enclosed space.

- (xi) Permit to be invalidated and new Risk Assessment to be carried out whenever there is a change to any conditions within the original Risk Assessment.
- (xii) When an accident involving injury to personnel occurs in an enclosed space, the first action should be to raise the alarm. Although speed is vital, a rescue attempt must not be made until all necessary equipment and personnel are ready.
- (xiii) Cargo and ballast pumprooms are to be considered as “special” places (See ISGOTT Fifth Edition Chapter 10.10). Best practice shows a clear requirement for a document to control pumproom entry which may not be a full entry permit for enclosed spaces.

FURTHER READING

IMO MSC Circular MSC/Circ 1084 – Principles for Hot Work on Board all Types of Ship.

IMO Assembly Resolution A.864 (20) Recommendations for entering enclosed spaces aboard ships.

OCIMF Information Paper on Pumproom Safety (Reprinted 1995)*

* Downloadable from the OCIMF website