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HOT WORK

1. DEFINITION

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 electric arc or gas welding equipment, cutting burner equipment or other forms of naked flame, as well as heating or spark generating tools, regardless of where it is carried out on board a ship.[1]

2. POLICY

2.1. Hot Work should only be considered if it is necessary for safety and or immediate operation of the ship and there are no practical alternative means of repair.

2.2. No Hot Work is to be carried out on bulkheads of bunker tanks containing bunkers, or on structure which will conduct the heat of hot work into the bunker tank, or within 0.5m from such bulkheads.

2.3. While the vessel is within port limits Hot Work is permitted only in accordance with the applicable National, State, Port and Local Hot Work Regulations or other national safety and health rules[2], and subject to any restrictions that may be imposed.

2.4. The designated Hot Work area on board shall be the engine room workshop or welding shop situated within the machinery space and first consideration shall be given to performing any hot work in this space[3]. A Hot work permit is not normally required for Hot Work in this area.

2.5. A Hot Work permit is required for Hot Work outside of the designated Hot Work area (Engine room workshop or welding shop). No Hot Work should be undertaken in a dangerous or hazardous / flammable area until it has been carefully prepared and isolated and[4] made safe, and has been proved to be safe, and all appropriate approvals have been obtained.

2.6. Company authorisation is first required before carrying out Hot Work anywhere outside of the designated Hot Work Area (Engine room workshop or welding shop) on board.

2.7. Hot Work is prohibited on board during bunkering operations.

2.8. Hot work is prohibited on deck but permitted only in engine room workshop while vessel is carrying dangerous cargo or cargo likely to emit flammable vapours. Refer IMSBC code for properties and hazards of cargo.

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2.9. A separate permit for hot work is to be issued for each distinct location.

3. WORK IN THE DESIGNATED HOTWORK AREA

3.1. Before commencing hot work, the work area is to be checked to ensure that it is free from combustible materials. Portable and fixed firefighting equipment must be readily available and in good working order.

3.2. When working on pipes that may have been exposed to hydrocarbon liquids or vapours, they should be checked to ensure they are free of hydrocarbons.

4. HOT WORK OUTSIDE THE DESIGNATED HOTWORK AREA

Hot Work outside the Designated Hot Work Area is normally authorised by the vessel's Ship Manager or in his absence (after hours) the duty Ship Manager, Marine Superintendent, or DPA[5]

Hot Work outside of the designated Hot Work area is to be carefully assessed before the work starts, as follows:

4.1. The Master is responsible for decide whether Hot Work is justified, is safe, and the extent of precautions necessary. The flow chart at the end of this section should be used as a guide throughout the decision-making process. The flow chart assumes the work is considered essential for safety or the immediate operational capability of the ship.

4.2. Before Hot Work is started a safety meeting under the chairmanship of the Master must be held, at which the planned work and safety precautions should be carefully reviewed. All those with responsibilities in connection with the Hot Work should attend the meeting. A formal risk assessment must be carried out using the companies risk assessment form.

4.3. An Officer must be clearly and unambiguously designated responsible for supervision of the work, and similarly another Officer be designated responsible for safety precautions including means of communication between all parties involved.

4.4. All personnel involved in the preparations and in the hot work operation must be briefed and instructed in their own roles. They must clearly understand which Officer is responsible for work supervision and which for safety precautions.

4.5. Before commencing Hot Work outside of the designated Hot Work Area (Engine room workshop or welding shop) the Master shall inform the Company of details of the work

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proposed and procedures to be followed and obtain authorisation for work to proceed (even if hot work is undertaken by shore personnel to repair the stevedore damages).

We recommend the following information to be sent to the company in order to obtain authorisation for work to proceed:

a. Reason for hot work.

b. Planned start and completion time.

c. Exact location of hot work.

d. Distance to closest compartment (if any) with LEL more than 2% by volume.

e. Details of hot work to be carried out.

f. Confirmation that all precautions have been taken care of as per HSE Procedures Manual 4.11.1

g. Descriptions of any additional precautions.

h. Cargo plan, work plan and risk assessment must be attached to the Company communication.

   i. The request must be e mailed to your Ship Manager and cc to Technical at the email address as per the Contacts list. You will receive a reply within 24 hours, if it's urgent you are to follow up the email with a phone call to your Ship manager, if you cannot get hold of your Ship Manager then contact the DPA. Hot work cannot take place outside the designated Hot Work area without authorization from the company.

   ii. If hot work is agreed and the Master gives final approval, the Company must be informed when the hot work has been actually completed.

i. Any changes in the conditions which formed the basis for issuing the original hot work permit should invalidate it. Hot work should cease, and not be restarted until all safety precautions have been re-checked and a new hot work permit has been issued, and agreement reached with the Company as appropriate.

j. A senior licensed Deck or Engineer Officer should always be present at the site of the hot work when it commences and must make a final inspection after the hot work is completed. An Officer adequately trained to the satisfaction of the Chief Officer (on board Safety Officer) must constantly monitor the operation throughout, especially for the presence of flammable gases and other assessed hazardous situations.

k. Before Hot Work commences, a Hot Work Permit must be issued by ships staff utilising the Company Hot Work Permit Form, irrespective of any other hot work permit already issued by a shipyard or the Port Authority.

4.6. Before commencing hot work, the work area a written plan for undertaking the work should be completed, discussed, and agreed by all who have responsibilities in connection with the work. This plan should define the preparations needed before work commences, the

procedures for actually carrying out the work and the related safety precautions. The plan should also indicate the person authorising the work and the people responsible for carrying out the specified work, including contractors if appropriate.

4.7. A risk assessment should be carried out to identify the hazards and assess the risks involved (using CFM[6]). This will result in a number of risk reduction measures that will need to be taken to allow the task to be carried out safely. The Plan and Risk Assessment is to be forwarded to the vessel's Ship Manager for his acceptance.

4.8. Fire safety precautions and fire extinguishing measures should be reviewed. Adequate fire-fighting equipment must be prepared, laid out and be ready for immediate use. The atmosphere of the area should be tested and found to be less than 1% LFL. Isolation of the work area and fire precautions should be continued until the risk of fire no longer exists.[7]

5. HOT WORK ON PIPELINES

Hot work on pipelines and valves is permitted only as follows:

5.1. Wherever possible pipelines must be detached from the system by cold work, and the remaining system blanked off; and removed to the designated hot work area.

5.2. Wherever possible, sections of pipelines and related items, such as strainers and valves, should be removed from the system and taken to the designated space for repairs.

5.3. The item to be worked on should be cleaned and gas freed to a "safe for hot work" standard. At least one end of the pipeline must be open to atmosphere. Heating coils and hydraulic oil lines should be flushed and saltwater lines and freshwater lines emptied and opened to ensure they are clean and free of hydrocarbons.

6. CHECKS TO BE COMPLETED BY OFFICER RESPONSIBLE FOR SAFETY

6.1. Immediately before hot work is started the Officer responsible for safety precautions should examine the area where the hot work is to be undertaken and ensure that the oxygen content is 20.8% by volume.

6.2. LEL should not me more than 1%.

6.3. Adequate fire-fighting equipment must be laid out and be ready for immediate use. Fire watch procedures must be established for the area of hot work, and in adjacent spaces where the transfer of heat or accidental damage may create a hazard e.g., damage to hydraulic lines, electrical cables, thermal oil lines etc. Monitoring should be continued for

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sufficient time after completion of hot work. Effective means of containing and extinguishing welding sparks and molten slag must be established.

6.4. The work area must be adequately and continuously ventilated. The frequency of atmosphere monitoring must be established. Atmospheres should be re-tested after each break in work periods, and at regular intervals. Checks should be made to ensure there is no ingress of flammable vapours or liquids or toxic gas from adjacent or connected spaces.

6.5. The results of the initial and repetitive atmosphere checks are to be recorded in the space provided on the Hot Work Permit or, if in an enclosed space, on the Enclosed Space Entry Permit. When recording the readings on the Enclosed Space Entry Permit, it must be kept and then eventually filed with the relevant Hot Work Permit.

6.6. Welding and other equipment employed should be carefully inspected before each occasion of use to ensure it is in good condition. Where required it must be correctly earthed. Special attention must be paid when using electric-arc equipment ensuring that:

6.6.1. electrical supply connections are made in a gas free space.
6.6.2. existing supply wiring is adequate to carry the electrical current demanded without overloading, causing heating.
6.6.3. insulation of flexible electric cables laid across the deck is in good condition.
6.6.4. the cable route to the worksite is the safest possible, only passing over gas free spaces; and
6.6.5. the earthing connection is adjacent to the work site with the earth return cable led directly back to the welding machine.

HOT WORKFLOW CHART