



**Maritec Tanker Management Pvt Ltd**  
Lotus Corporate Park, G wing – 501, 5<sup>th</sup> Floor,  
Graham Firth Compound,  
Goregaon (E) Mumbai – 400063.  
Email: [qhse@maritectankers.com](mailto:qhse@maritectankers.com)

## **SAFETY CIRCULAR**

***05<sup>th</sup> Feb 2019***

TO: Fleet

SUBJECT: *Procedures for deactivation and reactivation of shipboard equipment and systems*

Dear Master,

### **Definitions**

Energy Isolating Device:

A disconnect switch, circuit breaker, manually operated valve, blind flange, or other device used to ensure that power or energy cannot flow to a piece of machinery or equipment.

### **General Responsibilities**

1. The vessel shall provide information, instruction and supervision to workers on proper lockout procedures for each piece of equipment they will be operating.
2. An initial review should be made to determine which switches, valves, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, hydraulic, pneumatic, chemical, thermal,...) may be involved.
3. The vessel should ensure that contractor know which energy sources may need to be controlled. Contractor should check with a chief engineer / chief mate or other knowledgeable person if in doubt about which energy sources may need to be controlled.
4. When equipment is to be locked out, crew , supervisors and contractor should follow accepted lockout principles, including:
  - Pre-planning for the lockout by identifying all energy sources, switches, etc.
  - Where lockout is complex, a written sequence in checklist form should be prepared for equipment access, lockout/tag out, clearance, release and start-up.
  - All workers affected by the lockout should be notified.

- Equipment should be shut down by normal means by turning of switches and closing valves etc.
- Equipment should be isolated from energy sources by disconnecting or blocking the sources of energy.
- Lockout and tag the energy isolating devices by padlock or some other locking device that the worker has control over as well as a tag indicating that the equipment has been shut down.
- Verify that all energy sources have been isolated by attempting to cycle the equipment prior to working on it.
- When work is completed, release equipment from lockout.
- Test equipment.

## **Factors to consider when locking out equipment**

### **Lockout Procedures**

#### **Preparation**

1. Notify all affected crew and workers that a lockout is required and the reason for the lockout.

#### **Machine or Equipment Shutdown and Isolation**

1. If the equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.). Only workers knowledgeable in the operation of the specific equipment should perform shutdown or re-start procedures.
2. Operate the energy-isolating device(s) so that all energy sources (electrical, mechanical, hydraulic, etc.) are disconnected or isolated from the equipment.
3. Electrical disconnect switches should never be pulled while under load, because of the possibility of arcing or even explosion.
4. Stored energy, such as that in capacitors, springs, elevated machine parts, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc., must also be released, disconnected, or restrained by methods such as grounding, repositioning, blocking or bleeding-down.
5. Pulling fuses is not a substitute for locking out. A pulled fuse is no guarantee the circuit is dead. Even if a circuit is dead, another person could inadvertently replace the fuse.
6. Equipment that operates intermittently, such as a pump, blower, fan or compressor may seem harmless when it is not running. Do not assume that because equipment is not operating at a particular point in time that it will remain off for the duration of any work to be performed on it.

#### **Application of Lockout/Tag out**

1. Lock out and tag the energy-isolating device with an assigned, individual lock. A crew member / worker will not be protected unless he/she uses his/her own padlock.
2. If more than one person is working on the same piece of equipment at the same time, each one should lock out the equipment, by placing a personal lock and tag on the group lockout device when he/she begins work, and

should remove those devices when he/she stops working on the machine or equipment.

3. Locks and tags should clearly show the name of the person who applied the device, the date, and the reason for the lockout. This identifies who is servicing the machinery or equipment. In a multiple lockout/tagout situation, it will also identify any worker(s) who may not have finished working.
4. Locks and tags must be durable enough to withstand the environment in which they are to be used. Information on the locks and tags should remain legible.
5. Locks must be substantial enough to prevent removal without the use of excessive force. Tags must be substantial enough to prevent accidental or inadvertent removal.
6. Both locks and tags are to be standardized by colour, shape, or size. Tags should be easily recognized and provide appropriate information about the lockout.
7. For some equipment it may be necessary to construct attachments to which locks can be applied. An example is a common hasp to cover an operating button. Tags must be attached to the energy isolating device(s) and to the normal operating control in such a manner as to prevent operation during the lockout.

### **Verification of Isolation**

1. After ensuring that no workers can be injured, operate the push button or other normal controls to verify that all energy sources have been disconnected and the equipment will not operate.
2. If there is a possibility of re-accumulation of stored energy, such as an increase in pressure to a hazardous level, isolation of the equipment must be periodically verified until the maintenance or repair is completed, or until the possibility of such accumulation no longer exists.
3. Return operating controls to neutral position after the test. A check of system activation (e.g. use of voltmeter for electrical circuits) should be performed to ensure isolation.
4. The equipment is now locked out.

### **Lockout/Tag out Interruption**

1. If a machine is locked/tagged and there is a need for testing or positioning of the equipment/process, the following steps should be followed:
  - Clear the equipment/process of tools and materials.
  - Ensure workers are a safe distance from any potential hazard.
  - Remove locks/tags according to established procedure.
  - Proceed with test.
  - De-energize all systems and re-lock/re-tag the controls before resuming work.

### **Release from Lockout/Tag out**

1. Before locks and tags are removed and energy is restored to the machine or equipment, inspect the work area to ensure that non-essential items have been removed and that machine or equipment components are operationally intact.

2. Ensure workers are a safe distance from any potential hazard.
3. Each lock and tag should be removed from each energy-isolating device by the worker who applied the lock and tag.
4. Notify affected workers that locks and tags have been removed.

### **General Lockout Recommendations for Servicing**

1. Disengage the power and stop the machine before servicing.
2. Do not clean, unplug, lubricate, adjust or repair any machine while it is running, unless it is specifically recommended in the service or owner's manual.
3. Lock out the ignition and put a warning sign over the ignition that tells everyone that you are working on the machine.

### **Restoring Equipment back to service**

1. When the job is completed and equipment is ready for testing or normal service, check the equipment area to see nobody is exposed and all fittings and connections are back in place.
2. When equipment is clear, locks/tags can be removed. The energy isolating devices (electricity, steam, oil,...) can be operated to restore energy to the equipment.
3. Shipyard or contractor responsible and vessel responsible person should sign both an inspection document of the equipment serviced/overhauled.

For every type of equipment the makers guidelines to be followed which to be found in the operators instruction service manual. Only properly skilled and qualified personnel should work on the type of equipment where he is dedicated for.

### **Lockout for Hydraulic Systems, Pumps, Engines, Fans ,...**

1. Crew and workers should always follow instructions in the operator's manual for servicing any systems.
2. Shut off the drive source (steam, gas, electricity,...) that powers the system.
3. When applicable, blanking devices should be used.

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