

**SAUDI ARABIAN OIL COMPANY (Saudi Aramco)
GENERAL INSTRUCTION MANUAL**

G. I. NUMBER

6.012

ISSUING ORG. LOSS PREVENTION DEPARTMENT

ISSUE DATE

07/22/2007

REPLACES

07/22/2001

SUBJECT ISOLATION, LOCKOUT AND USE OF HOLD TAGS

APPROVAL

HJK

PAGE NO.

1 OF 8

CONTENTS:

- 1.0 Purpose
- 2.0 Applicability
- 3.0 Responsibilities
- 4.0 General Requirements
- 5.0 Lock, Tag, Clear and Try Electrical Isolation Procedures
- 6.0 Procedure for Emergency Removal of Lockout Devices
- 7.0 Piping and Equipment Isolation Procedures

REFERENCES:

- GI 2.100 - Work Permit System
- OSHA 29 CFR 1910.147 - The Control of Hazardous Energy (Lockout/Tagout). In general, this GI follows the requirements outlined in the OSHA requirements.

*** 1.0 PURPOSE:**

The purpose of this General Instruction is to define minimum requirements for isolation, lockout and use of hold tag procedures at Saudi Aramco facilities to assure protection of assets and personnel involved in maintenance/inspection of equipment.

2.0 APPLICABILITY:

All Saudi Aramco departments shall apply this instruction in situations where equipment could be damaged or personnel injured due to an unexpected release of energy or hazardous materials. Sources of energy include mechanical, electrical, hydraulic and pneumatic systems. Examples of hazardous materials include H₂S or other toxic chemicals, hydrocarbons, radioactive sources, hot water, and steam.

**** 3.0 RESPONSIBILITIES:**

Department managers, division heads and supervisors are responsible for ensuring compliance with this GI.

4.0 GENERAL REQUIREMENTS:

- * 4.1 Whenever personnel work on equipment and could be injured because of energy in the system, the equipment shall be isolated from its energy sources. For fluid systems this could require the installation of blinds, the closure and locking of valves, the removal of

SAUDI ARABIAN OIL COMPANY (Saudi Aramco) GENERAL INSTRUCTION MANUAL		G. I. NUMBER 6.012	
		ISSUE DATE 07/22/2007	REPLACES 07/22/2001
		APPROVAL HJK	PAGE NO. 2 OF 8
ISSUING ORG.	LOSS PREVENTION DEPARTMENT		
SUBJECT	ISOLATION, LOCKOUT AND USE OF HOLD TAGS		
<p>fluid from the system, or the physical removal of piping. For electrical systems, appropriate isolation could include the locking or removal of switches, circuit breakers, fuses or other isolating devices, or disconnection of the power supplies. Residual energy in any system must be removed before work begins. Proper isolation of equipment shall be characterized by the nature of the material to be protected against, the specific work to be conducted, and the piping configuration present at the job site.</p> <p>* 4.2 Operations or controlling organizations shall develop isolation, lock, and hold tag procedures for their operations or adopt this instruction as written if it will satisfy their lock and hold tag requirements. Specific isolation, lock and hold tag procedures shall be developed for any complex equipment or processes and incorporated into departmental Operating Instruction Manuals (OIM's).</p> <p>4.3 Operations and maintenance organizations and each department responsible for implementing the lockout procedures per paragraph 4.2 shall train relevant personnel in all elements of the program.</p> <p>4.4 Operations and maintenance organizations shall provide necessary lockout equipment to employees.</p> <p>5.0 LOCK, TAG, CLEAR AND TRY ELECTRICAL ISOLATION PROCEDURES:</p> <p>* 5.1 Prior to commencing work, operations shall identify isolating locations and types of isolating devices required. If necessary, they shall consult with third parties, such as electrical specialists. Equipment shall then be electrically isolated and locks and tags installed by operations, the work area cleared of equipment and personnel, and the start switch(es) tried. This is a distinct 4 step process to ensure that the equipment is properly isolated.</p> <p>5.1.1 Isolation will have been completed only when no associated control device, such as a push button, control interlock or automatic start-up control circuit, shall have the capability of energizing equipment.</p> <p>5.1.2 In situations where it is not possible to lock out or chain off an isolating device, isolation may be accomplished by removal of fuses, disconnection of electrical cables, or physical removal of a component of the system supplying energy to the equipment. The point of physical interruption shall be identified with a fully completed hold tag.</p>			

SAUDI ARABIAN OIL COMPANY (Saudi Aramco) GENERAL INSTRUCTION MANUAL		G. I. NUMBER 6.012	
		ISSUE DATE 07/22/2007	REPLACES 07/22/2001
		APPROVAL HJK	PAGE NO. 3 OF 8
ISSUING ORG.	LOSS PREVENTION DEPARTMENT		
SUBJECT	ISOLATION, LOCKOUT AND USE OF HOLD TAGS		
<p>5.1.3 When isolation has been completed (or before if appropriate), operations will de-energize equipment and ensure that it contains no residual energy.</p> <p>* 5.2 Other organizations or individuals working on equipment shall also install their locks and tags at locations identified by operations. Multiple lockout clips shall be used if necessary. Multiple lockout clips, locks and tags are available in B2B, (see appendix for SAP stock numbers.)</p> <p>5.3 Each lock on a piece of equipment, or on a multiple lockout clip, must be identified. A tag (Saudi Aramco Form 525) shall be installed on each lock indicating plant number or location, equipment name, date and time of lockout, name, badge number, organization, contact phone and signature of the individual who installed the lock and the reason for the lock's installation.</p> <p>* 5.3.1 Each organization issuing locks shall have a system of uniquely identifying locks. Acceptable methods include color coding, stamping or engraving locks appropriately.</p> <p>5.3.2 Each lock shall be keyed separately, with no duplicate key, to ensure removal only by the authorized user.</p> <p>5.4 Verification tests, in which all affected parties participate, shall be conducted by Operations on each isolating device and on each piece of equipment isolated.</p> <p>5.4.1 Each isolating device, such as a disconnect switch, shall be physically tested by moving its operating mechanism against the padlock, multiple lockout clip, or chain, to confirm that it cannot be operated.</p> <p>5.5 When a craftsman leaves the job site temporarily, but intends to return to complete work, his locks and tags may be left installed, provided this is acceptable to controlling organizations. Operations may require craft locks and tags to be removed. Upon his return to work, the employee shall verify his locks and tags are still in place ensuring the equipment is still isolated prior to restarting his work.</p> <p>** 5.6 Sometimes it is necessary for large numbers of maintenance personnel to lock and tag process equipment and/or electrical breakers, such as during a T&I or repair of a compressor. Each person must be afforded individual protection. In those cases, a "group lockout" procedure can be employed to ensure individual protection while avoiding large numbers of locks and tags on an isolation point as follows:</p>			

SAUDI ARABIAN OIL COMPANY (Saudi Aramco) GENERAL INSTRUCTION MANUAL		G. I. NUMBER 6.012	
		ISSUE DATE 07/22/2007	REPLACES 07/22/2001
		APPROVAL HJK	PAGE NO. 4 OF 8
ISSUING ORG.	LOSS PREVENTION DEPARTMENT		
SUBJECT	ISOLATION, LOCKOUT AND USE OF HOLD TAGS		
<p>5.6.1 An operations representative shall lock and tag each isolation point with single-keyed locks as per written isolation procedure described in Section 4.2.</p> <p>5.6.2 The maintenance supervisor/foreman shall also lock and tag the isolation points.</p> <p>5.6.3 The maintenance supervisor/foreman's key(s) to these locks are placed in a Group Lockout box. Lockout boxes can be acquired through B2B (see appendix for SAP stock numbers).</p> <p>5.6.4 Multiple lock clips (hasps) are then attached on the closed group lockout box.</p> <p>5.6.5 The operations representative shall place his lock and tag on the box/hasp first and maintain possession of his key(s) until job is complete.</p> <p>5.6.6 Each member of the maintenance crew shall then place his lock and tag on the multiple lock clip and maintain possession of his key(s) until job is complete.</p> <p>5.7 When a craft shift change occurs and work is not complete, the oncoming shift may either:</p> <p>5.7.1 Install their own locks and tags at locations where the previous shift had them - in which case the off-going shift shall remove their tags and locks.</p> <p>5.7.2 Effect a transfer of keys between shifts. This transfer requires the craft foremen or supervisors to conduct a detailed review of installed locks and tags. Craft tags may be endorsed by the oncoming shift or new tags may be installed.</p> <p>5.8 When an operations shift change occurs, the oncoming supervisor shall review locations and placement of isolated equipment, locks and tags. These operations tags and locks may be left installed and do not require endorsement at each shift change. Keys to locks shall be transferred at the time the review is made.</p> <p>5.9 When a craftsman completes his work, or leaves the job site permanently, his tags and lockout devices shall be removed. The craft foreman or supervisor shall advise the Operations Supervisor that the craftsman has completed his work and is removing his locks and tags.</p> <p>5.10 Operations or controlling organizations shall always be the first to install a lock and tag on a piece of equipment and the last to remove them. This lock and tag shall not be removed until operations personnel have checked and examined equipment to ensure it can be safely energized.</p>			

SAUDI ARABIAN OIL COMPANY (Saudi Aramco) GENERAL INSTRUCTION MANUAL		G. I. NUMBER 6.012	
		ISSUE DATE 07/22/2007	REPLACES 07/22/2001
		APPROVAL HJK	PAGE NO. 5 OF 8

ISSUING ORG. LOSS PREVENTION DEPARTMENT

SUBJECT ISOLATION, LOCKOUT AND USE OF HOLD TAGS

* 6.0 PROCEDURE FOR EMERGENCY REMOVAL OF LOCKOUT DEVICES:

6.1 No padlock/lockout device shall be cut or forcefully removed, without the permission of the lock owner's superintendent or the operating shift superintendent.

6.1.1 (a) The operations shift superintendent will attempt to contact the individual who installed the lock, or his supervisor, to confirm that the work is complete, that the employee is safe and that the padlock can be removed.

(b) If the individual, his supervisor, or superintendent cannot be contacted, the shift superintendent may remove the lock(s) and tag(s) only after reviewing the equipment/process to be energized, to ensure that personnel and facilities are safe from injury or damage.

6.1.2 The shift superintendent shall verbally advise the operations division superintendent of the action taken and record the removal of the lockout device in the operations log book. He will then document the incident in a written memo to the operations division superintendent stating why the lockout device was removed, the original purpose of the lockout device, and employees involved.

** 7.0 PIPING AND EQUIPMENT ISOLATION PROCEDURES:

There are four primary methods for isolating process lines and equipment to prevent the release of harmful energy or materials into the work area during maintenance or construction activities. Operations or controlling organizations shall ensure specific lock, tag and hold procedures are in place to protect personnel. The methods are arranged below in general order of protection provided, but the specific isolation method is determined by the task to be performed and the material/stored energy to be protected against. These include:

7.1 Single block and tag.

7.1.1 This is the least desirable method for use in hydrocarbon service; it may be suitable for routine maintenance activities such as sock filter changes, temporary isolation while a blind is being installed, or cleaning of inline strainers. It is not acceptable for hot work permit activities or entry into confined spaces.

7.1.2 The block valve shall be fully closed, locked and tagged.

SAUDI ARABIAN OIL COMPANY (Saudi Aramco) GENERAL INSTRUCTION MANUAL		G. I. NUMBER 6.012	
		ISSUE DATE 07/22/2007	REPLACES 07/22/2001
		APPROVAL HJK	PAGE NO. 6 OF 8
ISSUING ORG.	LOSS PREVENTION DEPARTMENT		
SUBJECT	ISOLATION, LOCKOUT AND USE OF HOLD TAGS		
<p>7.1.3 The fluid shall be removed from the system safely and the valve shall be tested for leakage before work begins.</p> <p>7.2 Double block and bleed.</p> <p>7.2.1 This method is superior to single lock and tag. It consists of the locking and tagging of two consecutive valves on the same line that have a drain valve installed between them that shall be opened as a drain to determine if the locked valves are passing. It shall not be allowed for personnel entry into confined spaces.</p> <p>7.2.2 The drain valve shall be checked to verify that it is not clogged or plugged and be securely piped or hosed away from the work area to ensure that any fluids leaking by the closed valves do not endanger the ongoing work.</p> <p>7.3 Disconnection</p> <p>A less frequent method of isolation for long term maintenance activities. The act of dropping out a spool piece to form a physical disconnect in the piping, often because the piping design will not allow the insertion of a fully rated blind. Steps shall be taken to ensure no hazardous materials can leak or be discharged from the open ends of piping, e.g. blind flanging as described in 7.4 below.</p> <p>7.4 Blinding</p> <p>The installation of a solid metal plate between two pipe flanges or on the end of a disconnected pipe to prevent any materials from being released.</p> <p>7.4.1 A blinding procedure and sketch shall be created showing blinding locations for each piece of equipment requiring more than two isolation blinds. The blinding procedure will include precautions to complete the work safely such as: proper line entry, lock and tag locations, blind rating, location and size of blind, etc.</p> <p>7.4.2 The breaking of any flange containing hazardous materials shall always be done under the assumption that the line is pressurized. Appropriate personal protective equipment (PPE) will be utilized. The stud bolts will be loosened so that any leak from pressurized fluid will occur at the “5:00” position (down and away from the person doing the work).</p> <p>7.4.3 Blinds shall be fully rated for their service per ANSI/ASME B31.3 to withstand potential internal pressures. Each blind shall be stamped with the pressure rating.</p>			

SAUDI ARABIAN OIL COMPANY (Saudi Aramco)
GENERAL INSTRUCTION MANUAL

G. I. NUMBER

6.012

ISSUING ORG. LOSS PREVENTION DEPARTMENT

ISSUE DATE

07/22/2007

REPLACES

07/22/2001

SUBJECT ISOLATION, LOCKOUT AND USE OF HOLD TAGS

APPROVAL

HJK

PAGE NO.

7 OF 8

Factory produced blinds are recommended. Facility built blinds may be used but must be approved by local engineering for service and rating and the results documented.

- 7.4.4 Blinds shall be installed with matching gaskets to ensure effective isolation, with all stud bolts in place and properly tensioned.
- 7.4.5 Slip blinds shall be equipped with a tail or "T"-handle drilled with a hole to attach a tag.
- 7.4.6 Blinding shall be the only acceptable method of equipment isolation for entry into confined spaces.
- 7.4.7 A blind list shall be prepared when more than two blinds are used to isolate equipment to ensure proper installation and removal. The list shall, at a minimum, include blind information on the following: blind number, date of installation, location, blind rating, installer name, date of removal, and remover name.
- 7.4.8 Blinds shall be tagged with a unique number to ensure proper identification on the blind list.
- 7.4.9 Blinds when not in use shall be properly stored to protect mating surfaces.

APPROVED: _____
 MANAGER,
 Loss Prevention Department

DATE: _____

SAUDI ARABIAN OIL COMPANY (Saudi Aramco)
GENERAL INSTRUCTION MANUAL

G. I. NUMBER

6.012

ISSUING ORG. LOSS PREVENTION DEPARTMENT

ISSUE DATE

07/22/2007

REPLACES

07/22/2001

SUBJECT ISOLATION, LOCKOUT AND USE OF HOLD TAGS

APPROVAL

HJK

PAGE NO.

8 OF 8

APPENDIX

LOCK/HOLD TAG

SAUDI ARAMCO FORM #525

* LOCK-OUT; MULTIPLE

SAP # 1000128114

SAP # 1000128118

* LOCK

SAP # 1000162049

** GROUP LOCKOUT BOX

SAP # 1000774337

** CIRCUIT BREAKER LOCKOUT DEVICE

SAP # 1000774338