COMPANY STANDARD INSTRUCTION

GUIDELINES FOR LOCKOUT, TAGOUT AND TRY (LT & T)

Instruction Number: IN-250-HSE-23

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		SSO	HSESM	TGM	MGM - SC/PE

Revision / Modification History:

Rev #	Date	Section No.	Reason for revision / modification
0	10/10/2018	-	New Instruction
1	10/09/2019	-	Added LDPE3 in the scope. Added hazard analysis form and written plan check list for the actuator valves in the appendix., removed operational activities from the exception list and few minor changes
2	05/07/2020	2 7.2 7.5/7.6.1 7.6	Added LDPE1,2 and Utility Plants are in the scope, Addition of information to access and use of LT & T list through QAPCO Intranet Portal Addition of LT N T locks & tags pictures for more clarification Removal of use of printed tags affix on LT & T tags as per audit recommendations

Contents

1. OBJECTIVE

The objective of this instruction is to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where there is a possibility for injury from unexpected energization or start-up of the machine/equipment or release of stored energy.

2. SCOPE

This instruction is applicable to LDPE-1, 2, 3, LLDPE, Utility, Vinyl, Ethylene Plant (EP2) & Logistic & Warehouse. This instruction has following exemptions and shall not be applicable to the following systems/activities:

- Turn around activities at LDPE-1, 2, 3, LLDPE, Utility, Vinyl, Logistic & Warehouse and maintenance job during plant shutdown (As per the HSE plan for Turnaround)
- Instrument air
- Plant air
- Low Pressure Steam (< 3.5 Kg/cm2),
- Portable water
- Demineralised water
- Raw Water
- Sea Water
- Fire Water

Note: This above system is required to be isolated and tagged out as per the instruction, however there is no need for a lock out on the above exempted systems. If above systems are part of any equipment and work on the equipment need isolation of above system, LT&T should be applied. e.g. work on Nitrogen compressor, in this case MW supply and return will be under LT&T.

3. INSTRUCTION SUMMARY

Lockout, Tag out and Try (LT & T) is one of the critical activity, apply to prevent staff from exposure to electrical and other process Hazards. This instruction is written primarily to address Maintenance or any other department working on equipment owned by another department. Maintenance working on Production owned equipment for example, changing filters elements on an inlet filter/separator where Production owns the equipment however Maintenance leads the work.

4. ABBREVIATIONS / DEFINITIONS

#	Abbreviation / Key word	Definition summary
1	Actuated Valve	A type of valve which is operated by any means (i.e. pneumatic, motors, etc.) other than manual operation.
2	Authorized Employee:	An individual who locks out or tags out machines or equipment in order to perform servicing or maintenance on a machine or piece of equipment (e.g. Production, Maintenance personnel)
3	Blue Lock Control Box:	A custody control box where the execution supervisor controls the blue locks and keys

4	Double Block and Bleed	Two in-line isolation valves and a bleed valve, used to drain or vent trapped fluid between the two closure elements
5	Drop out Spool	A physical isolation device that is designed to be removed to enable complete isolation from the operating process
6	Equipment Owner	The department owning the equipment or area of the Plant. For example: To add substation inside process unit ▪ **Process Equipment –** Production ▪ **Workshop/Substation –** Maintenance
7	Hazardous Energy Source	A source of energy that could lead to personnel injury, fire, equipment damage, spill or a release. The four common categories of hazardous energy are: ▪ **Electrical –** Motor Control Centre (MCC), Power Centre (PC), local panels, etc. ▪ **Chemical –** gases, liquids, flammables, acids, caustics etc. ▪ **Thermal –** steam, heat, etc. ▪ **Mechanical –** hydraulic pressure, springs rotating equipment, etc. ▪ **Pneumatic –** pressure
8	Lockbox	A portable box containing a predetermined set of locks and keys that is used to secure isolation points to positively isolate a system
9	Lockout Device	A padlock, chain, hasp, or other lockable devices used to positively secure hazardous energy sources in a safe position.
10	Shift Supervisor	The Supervisor (e.g. Shift Supervisor) assigned by Equipment owner responsible for verifying the content of the lockbox before affixing the "Orange" lock to the lockbox. The Shift Supervisor may delegate this role to an operator/designee as required. But the Operator should be different from the Operator who is going to sign LT&T list and PTW.
11	LT&T List	A document prepared, controlled and approved by the Equipment Owner listing the exact isolation points. The *LT&T List* (Appendix 9.4) is used to establish the quantity of locks and tags required to isolate the system, document the installation, verification and removal of the locks.
12	Lead Executor	The qualified worker receiving the permit to work and responsible to ensure that all conditions of the permit, agreed to with the Permit Issuer, are being fulfilled at all times throughout the job.
13	LT&T Verifier	The lead executor responsible for verifying the tag out points by hanging blue tags, signing the LT&T List, verifying the contents of the lockbox and finally affixing the "Blue" lock on the lockbox.
14	Electrical Technician	Certified electrical staff responsible for Electrical isolation & de-isolation of electrical equipment. In addition to the LT&T verifier roll, he is responsible for physical isolation /de-isolation of electrical equipment and applying Red lock & Red tag in presence of equipment owner
15	Orange Lock Control Box	A custody control box where the equipment owner (Supervisor/Designee) controls the orange locks and keys.
16	Open Bleeder Tag	A tag affixed on bleeder which is required to remain open during the duration of a job.
17	Partial LT&T Breakage	Opening of lock box for an urgent job such as a test run on a motor or leak check.

18	P&ID	Piping & Instrumentation Diagram.
19	PRV	Pressure Relief valve
20	Positive Isolation	The condition of energy or equipment after the application of a lockout device at a point of isolation. For example, locking a valve or installation of a physical barrier between a potential energy source and personnel (e.g. inserting a blind).
21	Single Block Valve	Single valve used to achieve positive isolation, used for non-critical process service, such as low-pressure system or nontoxic, non-hydrocarbon, non-hazardous process fluids
22	Tag out Tag	A tag which is affixed to the isolation point because a lock or locking device/accessories cannot be secured to the isolation point.
23	Try	A step taken to ensure isolation and de-energization (zero energy test) before starting work on machines or equipment. Isolations shall be adequately tested (TRY) to prove effectiveness. In electrical isolation it may be achieved through local switch. If local switch is not available, electrical leads may be tested with a voltmeter and /or from DCS on/off switch. The Try test tags must be fixed at the nearest location of the equipment. If it is not possible to try an equipment (such as transformers) then electrical isolation certificate can be considered. Verifier has to clear mention the reason of not making the try.
24	MGM SC/PE	Manufacturing Group Manager SC/PE
25	TGM	Technical Group Manager
26	CHSEQO	Chief HSEQ Officer
27	HSESM	HSE Support Manager
28	SSO	Sr. Safety Officer

NOTE 1
Where-ever possible, two or more means should be used to verify de-energization. For example, when isolating a process piece of equipment, full depressurization should be verified by two or more open bleeders and a pressure gauge. If in doubt that bleeders are open, nitrogen could be used to verify the bleeder is open and flowing.

5. DOCUMENT REFERENCES

#	Document ID	Document name	Summary of dependency or use
1	M-250-PSS-01	HSE integrated Management system Manual	QAPCO Safety Management system
2	PR-PSS- 114	Permit to work procedure	Detail s for QAPCO Work permit system
3	IN-250-HSE-14	HSE Instruction for Electrical Isolation-Deisolation Certificate	Details about the Electrical isolation & Cancellation process

4	IN-250-HSE-15	HSE Instruction for Security by Pass Certificate	Detail process regarding bypassing process and FF securities.
5	PR-251-SF-17	Piping isolation procedure	Details for isolation of circuits and vessels
6	PR-251-SF-05	HSSE Risk Assessment Procedure	Risk Assessment methodology
7	PR-QSS-61	Modification Change Management Procedure	Details about Modification Change Management
8	PR-340-LD-14	Learning and Development Procedure	Details of Training Process
9	Pr-QSS-128	HSE training Procedure	Detail of Training Process

6. RESPONSIBILITIES

#	Job Title	Responsibilities
1	Equipment Owner	• Develop, maintain and control Master LT&T Lists for equipment in their area. • Inspect the lockboxes prior to each use to ensure compliance with the procedure. ➢ Immediately report any discrepancies to the respective Safety Department and work with Safety to rectify the issue. • Control the lockboxes assigned and manage the distribution of lockboxes in their area. • Assign Shift Supervisor s and manage the orange lock control boxes to secure orange locks and keys. • Define the responsibility of applying yellow locks with yellow tags on each isolation points
2	Maintenance Electrical	• Physical isolation /de-isolation of electrical equipment and applying Red lock & Red tag in presence of equipment owner • Retain the utilized red lock key with the isolated equipment lock box maintained by equipment owner
3	Safety Department	• Assemble new lockboxes as requested by the equipment owner • Numbering and record keeping of the lock box • Distribution of lock boxes • Audit the compliance of this procedure and report discrepancies as required.
4	HSE Support	• Conduct the LT&T training to required personnel. • Issue and maintain LT&T ID cards to successful authorized Lead Executor
5	Execution Supervisor	• Assign or delegate LT&T Verifiers and manage the Blue Lock Control Boxes to secure blue locks and keys.

7. INSTRUCTION METHOD

7.1 METHOD OF ISOLATION:

i. The equipment owner must ensure the approved methods of isolation are used to prepare the equipment for work.

ii. Tagging is not a recommended method of isolation as hanging a tag does not achieve positive isolation. However, in below two situations the approved tags, as outlined below, are acceptable.

a) Where a lock or locking device/accessories cannot be secured to the isolation point, it is acceptable to use "Isolation Point TAGGED OUT" tags.

b) On the bleeders which are required to remain open during the execution of the job, an "Open Bleeder Tag" shall be used.

A table showing approved methods of isolation is shown below:

Type of Isolation	General Work	Hot Work	Confined Space
Drop out Spool	Yes	Yes	Yes
Blind Flange	Yes	Yes	Yes
Single block valve	Yes	No	No
Double block and bleed	Yes	No	No

NOTE 2
Pressure relief valves/devices (PRV) shall not be used as an isolation point.

iii. All double block and bleed isolations must have both block valves locked and tagged in the closed position.

a) Bleeds must be tagged in the open position with Open Bleeder Tag.

b) If bleeds are closed for any reason, the job associated with the LT&T must be stopped immediately.

iv. Actuated valves (e.g. pneumatic, hydraulic, motor-operated, etc.) are generally prohibited for use as isolation points for LT&T. However, where process conditions and/or other circumstances require their use, follow the s in Appendix 9.2, 9.10 & 9.11 (s for the use of an Actuated Valve as an Isolation Point for LT & T).

CAUTION 1
If possible, when a job has to be carried out on equipment that is steam traced or electrically traced, all steam/electrical tracing to that equipment should be isolated, drained and the tracing should be cold, before allowing work to start in the vicinity of the steam/electrical tracing. This requirement should be included in LT & T List whenever appliable.

7.2 PREPARATION LT&T LIST

i. General

a) The *LT&T List* (Appendix- 9.4) shall include all energy isolation points for the equipment or system to be worked on in Section 1.

b) It is required to indicate the TRY location(s) on the *LT&T List*.

c) Required to write "Isolation Point Number" on the LT&T tag that corresponds to the isolation list and P&ID.

d) Attach marked-up P&ID along with LT&T list. A hand sketch can be attached if P&ID is not available in some cases (e.g. steam traps, Level Glass isolation valves etc.) For example - HVAC system. The hand sketches can be prepared by the unit HVAC Supervisor, and approved by the unit Engineer.

e) All bleeders required to remain open must be grouped and listed separately at the end of the *LT&T List* (Section 2).

ii. The equipment owner is responsible for the development and control of LT&T Lists for each of their equipment's and systems.

iii. For easy access, the prepared LT & T list including Marked P & ID is available on QAPCO intranet Portal - safety section for different Plants.

iv. LT&T List must be approved by Shift Supervisor:

a) Shift Supervisor can delegate authority to a second person.

b) The Shift Supervisor or second person must sign the bottom of the LT&T List.

c) The second person can be a concerned area operator, or relevant equipment owner supervisor. (A concerned area operator is trained, approved and assigned to that unit

d) The second person and the operator signing the LT&T cannot be the same person.

v. Each time the LT&T List is revalidated, it must be approved by Shift Supervisor or delegate (Second person).

vi. All closed out LT&T list must be retained by the area owner for one months from the date of closure.

NOTE 3
If the LT&T and blinding is required across multiple units (outside of unit battery limit) the affected unit supervisors shall identify the isolation and blinding points and jointly approve the list and also have a detailed written plan describing the entire energy isolation and return to service processes which also includes roles, responsibilities & proper communication, etc.

7.3 WORKING ON LIVE OR RUNNING EQUIPMENT

An approved work procedure/Risk assessment (Method of Statement)/Check list is required to perform any work on live or running equipment. For example, cleaning, adjustment or lubrication.

7.4 ELECTRICAL ISOLATION

i. To positively isolate electrical energy, supply circuits shall be isolated by one of the following actions after de-energizing/stopping the equipment feeder [follow the electrical isolation and de isolation instruction for physical activities]:

a) Locking a circuit breaker/contactor/isolator in switched OFF position [rack out wherever possible]

b) Physically removing the electrical leads, tape, tag and lock the panel or lead ends

ii. An equipment owner yellow tag and a LT&T verifier blue tag must be installed at any switch or device used of starting the locked-out equipment.

a) Locations of switches or devices (TRY locations) used to start the equipment must be listed in the LT&T List as well as the energy isolation points.

iii. Electrical equipment that has been locked out for work must be TRIED prior to hanging tags at an appropriate Try Location:

iv. Electrical equipment, must be isolated, locked and tagged. Follow the electrical isolation and de isolation instruction (IN-250-HSE—14)

v. Equipment owner will contact the electrical for electrical isolation. Electrical technician after isolation will affix his red lock and red tag on the isolation point.

a) Electrical red locks are kept with the electrical department

b) Electrical red lock and tag must be affixed to the Electrical Feeder [appropriate location on the Cubicle/CB/Contactor/Isolator] in the presence of the equipment owner.

c) Equipment owner witnesses the electrical lockout and try by hanging a yellow tag at the same location and ensure that the red lock key is placed in the lock box maintained by equipment owner.

7.5 MAINTENANCE OF LOCKBOXES

i. The equipment owner must maintain lockboxes for equipment in their own respective area.

ii. Padlocks are color-coded for quick and easy identification.

Table - Lock Colors

Lock Owners	Color	Image of lock	Purpose	Keys
Equipment Owner	Yellow		At field on isolated valves (Except Bleeders)	Each box keyed alike
Shift Supervisor	Orange		At Lock Box	Individually keyed
Electrical	Red		Electrical isolation At Substation	Individually keyed
LT&T Verifier/ Task executor	Blue		At Lock Box	Individually keyed

iii. Lockboxes are initially created with specific numbers of locks and keys.

Table – Lockboxes

Locks in Lockbox	Keys in Lockbox
5 Locks	1 Key
10 Locks	1 Key
20 Locks	2 Key
40 Locks	4 Keys
50 Locks	4 Keys

iv. The equipment owner must audit their lockboxes prior to each use to ensure compliance with table in 7.5 (iii).

a) If a lock is missing and it cannot be located, take the lockbox out of service and bring the complete lockbox to the Safety Department (respective area safety officer) for proper system renumbering or recycling. -

b) If a key is broken, bring the broken key to the Safety Department for key replacement.

v. New lockboxes can be requested from the Safety by sending a detailed e-mail to Area Safety Representative.

a) Safety Department must manage the distribution of the lockboxes and all spare keys associated with them.

b) It is a serious safety violation for any department to order locks, keys or lockboxes for the purpose of LT&T, without Safety Section authorization or direction**.**

NOTE 4
Whenever a job requires multiple lock boxes or isolation requires from different units, follow the guidelines given in Appendix 9.3

7.6 Affixation & Requirement of LT&T Tags

i. The Equipment Owner must hang yellow tags on each isolation point (Including TRY points) listed in Section 1 of the LT&T List.

a) Yellow tags: Information must be filled using permanent marker

b) Yellow tags must be filled out completely to include name of the person installing the tags, unit, date of tagging, lock box number and isolation point.

ii. The Equipment Owner must also hang '*Open Bleeder Tag'* on each bleeder listed in Section 2 of the *LT&T List*.

a) Equipment Owner shall decide which bleeder should remain open during the execution of the job.

b) The Bleeder Isolation Number on the tag should match that on the LT&T List.

c) Attempts should be made to verify the bleeder is open and shall pass flow. Pressurizing and depressurizing with nitrogen is one way to verify flow if other is not clear.

NOTE 5
It must be ensured that the chain used to lock the isolation valve is secured snugly in a way that the valve cannot be operated.

iii. LT&T Verifier is required to hang blue tags at the try location (Hand Switch) only.

a) Blue tags: Information shall be filled using permanent marker

b) Blue tags must be filled out completely to include the name of person verifying the isolation point, discipline, date of verification and isolation point number.

iv. The electrical maintenance must hang red tags from each electrical isolation point where a red lock is used to positively isolate an electrical system.

a) Red tags: Information shall be filled using permanent marker

b) Red tags must be filled out completely to include the name of the person installing the tags, discipline, date of tagging, lock box number and Isolation Point.

c) All information on LT&T tags shall be filled using permanent/paint marker and it should be legible. During course of time, if any information on tag is not legible, it should be replaced immediately.

7.6.1 Using the Isolation Point TAGGED OUT Tag

i. The equipment owner hangs Isolation Point TAGGED OUT Tag at the location and clearly identifies in LT&T List that the isolation point is tagged only.

ii. Where a tag cannot be affixed directly to the energy isolation device, the tag shall be located as close as possible to the device, in a position that will be immediately visible to anyone attempting to operate the device.

iii. LT & T Tags images:

NOTE 6
LT&T Tags should be used ONLY for LT&T purpose.

7.7 Lockout Devices

i. Lockout devices shall be affixed to each isolation devices by authorized employees and deposit the key in equipment assigned lock box maintained by equipment owner.

- Yellow locks By Equipment owner
- Red lock by Electrical

ii. Lockout device where used, shall be affixed in a manner to that will hold the energy isolation devices in a "safe" or "off" position.

7.8 LT&T Verification

i. The execution supervisor or his designate is responsible for the LT&T verification process.

a) The verification process may be delegated to the first Lead Executor on the job.

ii. When LT&T includes electrical isolations, the LT&T Verifier must witness the TRY attempt before he/she secures a blue LT&T Verifier tag on the try location.

a) Witnessing the try attempt requires the operator to TRY the equipment in the presence of the verifier. Verifier will affix the blue tag on the try point.

iii. LT&T Verifier must visit try point as mentioned in LT&T list and hang Tag out tag.

iv. LT & T Verifier shall remove stubs (lower part) of the Isolation Point TAGGED OUT Tag and put the stubs inside the assigned lock box.

v. LT&T Verifier must sign the LT&T list and verify the contents of the lockbox:

a) Inspect the lockbox with the Shift Supervisor or his delegate to ensure the right number of locks and keys are in the lockbox.

b) Ensure that the isolation and blind list are approved by equipment owner for the job scope and that the verification step is an independent verification.

c) LT&T Verifier completes the verification process affixing the blue lock on the lockbox simultaneously with the Shift Supervisor affixing the orange lock

d) LT&T Verifier and Shift Supervisor or his delegate must determine if the job will be completed during the same shift.

e) If the job requiring the LT&T is planned to be done within the same shift, the LT&T Verifier may keep the blue lock key in his/her possession.

f) If the job requiring the LT&T is planned to exceed the same shift, then the LT&T Verifier must return the blue lock key to the blue lock control box.

g) Shift Supervisor must return the orange lock key to the orange lock control box.

h) LT&T is generally verified one time for the duration of the job, unless a partial LT&T break is required

i) If multiple work requires to be carried out, each Lead Executor has to affix his blue lock on the lock box by using a hasp.

7.9 Lock Tracking Sheet

i. After affixing orange lock on the lock box, shift supervisor/equipment owner shall enter the details of the lock such as department name, work permit no, Lock number color of the lock, locked by etc.in the lock tracking sheet (Appendix-9.5)

ii. Each Lead Executor will affix the blue lock on the lock box by using a hasp and shall enter the details of the lock on the lock tracking sheet (Appendix-9.5)

iii. If any other functional discipline (mechanical, automation, engineering etc.) wants to work on the same equipment, the concerned Lead Executor has to fix his own lock and details should be entered on the lock tracking sheet (Appendix-9.5)

iv. The additional blue lock keys shall be retained by the concerned functional leaders/technicians.

v. The lock tracking sheet must be secured with LT&T box pouch

vi. Each Lead Executor working on a locked-out system must ensure that a blue lock and orange lock are properly installed on the lock box

vii. If orange or blue lock are broken/missing on the lockbox, the Lead Executor must assume the LT&T is compromised and contact the Equipment Owner (Shift Supervisor) and Execution Supervisor to arrange for LT&T verification.

7.10 Removing the Verification Lock (Blue Lock) and Tag

i. When the job is complete, the Lead Executor should remove his blue locks after closing the PTW,

a) Execution Supervisor may authorize a technician to retrieve the blue lock key from the control box and remove the blue lock.

b) The execution supervisor cannot remove the blue lock unless the PTW is closed.

ii. Once the job is completed and the blue lock is removed, the LT&T is immediately compromised or broken.

a) If any additional work must be completed on the locked-out system, the LT&T must be completely re-verified with a new LT&T List.

iii. An acceptable practice to save time and better utilize resources allows the equipment owner to remove the blue tags when removing the yellow locks and tags from isolation point.

a) This is not a compromise of LT&T since the lockbox is open and the job is complete.

7.11 Removing the Equipment Owner Lock and Tags

Once the job is completed all permit closed and the blue lock is removed from the LT&T lock box, equipment owner will retrieve the orange lock key from the control box and open the LT&T lock box. Retrieve the yellow & red lock key from the box and remove the lock from the isolated equipment.

i. Yellow locks & tags: By Equipment owner

ii. Electrical locks & tags [red locks & tags] By -Electrical

7.12 Removal of Locks and Tags (If Lock not opening OR Key Lost)

i. Emergency removal of lockout locks and tags must only be granted as the extreme last resort.

a) All efforts must be made to find the key or the person who installed the lock, tag, LT&T ID.

ii. Emergency removal of lockout locks and tags must satisfy the conditions on the Emergency LT&T Removal Form (Appendix -9.7).

iii. Once the Emergency LT&T Removal Form has been completed, Fire Coordinators, are the only individuals authorized to cut off a lock and tags

a) It is a serious safety violation to cut off a lock or tag or lockbox without the proper authorization and approval.

iv. Any cut lock must be brought to the Safety Department, along with the associated lockbox.

7.13 Partial LT&T Breakage

i. Partial LT&T breakage can be granted if the equipment owner requires immediate access to equipment included in the locked-out system.

ii. Partial LT&T breakage is a last resort and is considered after all other options are exhausted.

a) Partial LT&T breakage may be required for an urgent job such as a test run on a motor or a leak test

NOTE 8
Partial LT&T breakage does not apply to bleeders

iii. The equipment owner must complete the Partial LT&T Breakage List Form (Appendix-9.6) following the joint approval process.

Three approvals required are from the Equipment Owner Supervisor, the Execution Supervisor and the Safety Representative. (Appendix 9.8)

iv. All applicable parties must approve the Partial LT&T Breakage Form by observing the equipment and appropriate safeguards at the job location.

a) The approving team must determine if all work permits must be terminated during the partial LT&T breakage or if work may continue on parts of the locked-out system.

b) This evaluation must be made on a case-by-case basis depending on the equipment and safeguards.

c) The equipment owner must ensure all steps are followed through the entire LT&T breakage process

7.14 Closing/Opening the Bleeder Valve

i. All double block and bleed isolations must have both block valves locked and tagged in the closed position.

ii. Bleeds must be tagged in the open position with Open Bleeder Tag.

iii. Before approving any isolation list, Shift Supervisor must ensure that adequate and correct bleeders are identified and addressed in the isolation list. Consideration should be given to identify the high point vent & low point drain in the system as "open bleeders" to clear any trapped gases/liquids.

iv. Appropriate bleeders to be used for gas testing shall be identified in the isolation list and included in the open bleeder list.

v. If open bleeders identified in the LT&T list are closed for any reason, the job associated with the LT&T must be stopped immediately**.**

vi. After closing the permit, if it is considered necessary to close the bleeder(s) to safeguard against the risk of isolation valve passing and developing a hazardous atmosphere when unattended (e.g. in flammable, toxic service), Equipment Owner must remove this tag from the bleeder and secure it to the applicable LT&T box pouch. The Section 2 of *LT&T List* (Appendix-9.4) is signed-off by Permit Issuer.

vii. Before re-issuing the permit, the Permit Issuer must ensure that all bleeders are open, and the tags are put back at the respective bleeder points. In addition, the Section 2 of the *LT&T List*" must be filled in.

7.15 Restarting Equipment

i. Before energy is restored to the equipment that has been locked out, it is the Equipment Owner responsibility to:

a) Inspect the equipment and area.

b) Verify that all lock devices and tags are removed from the isolation points and corresponding sections of the isolation list is filled out and signed off.

c) Ensure that all bleeder valves are closed, and the Open Bleeder Tags are returned to the LT&T box.

d) Confirm that all tags & locks are returned to the corresponding LT&T box

e) Ensure replacement of any machine guards and other safety equipment.

f) Ensure all personnel are safely positioned or removed from the area.

7.16 Temporary or Permanent Decommissioning of Equipment

i. Locks, tags and other accessories used for isolation shall remain in place if systems or equipment are taken out of service temporarily.

ii. Systems or equipment that are decommissioned or taken out of service permanently shall be physically separated from in-service systems and equipment through the Management of Change (MOC) process.

iii. Locks, tags, and other accessories used for the LT&T program shall not remain on the decommissioned equipment.

7.17 Training

i. Training for QAPCO employees and Contractors shall be administered as per QAPCO approved Training Matrix

ii. Contractor Lead Executors shall attend and successfully pass the classroom training.

iii. The HSE division must evaluate changes made to the procedure to determine if retraining is required.

a) Retraining must be conducted if significant changes are made to the procedure.

7.18 Audits

i. Periodic audits shall be conducted by the HSE.

ii. Lock Tag & Try (LT&T) Audit Checklist (Appendix-9.9) shall be used for carrying out the periodic inspection/audit.

iii. All periodic inspection reports shall be kept with the safety/owner department for record keeping.

iv. Respective owner department shall review each periodic audit findings and all action items to be initiated through internal tracking system

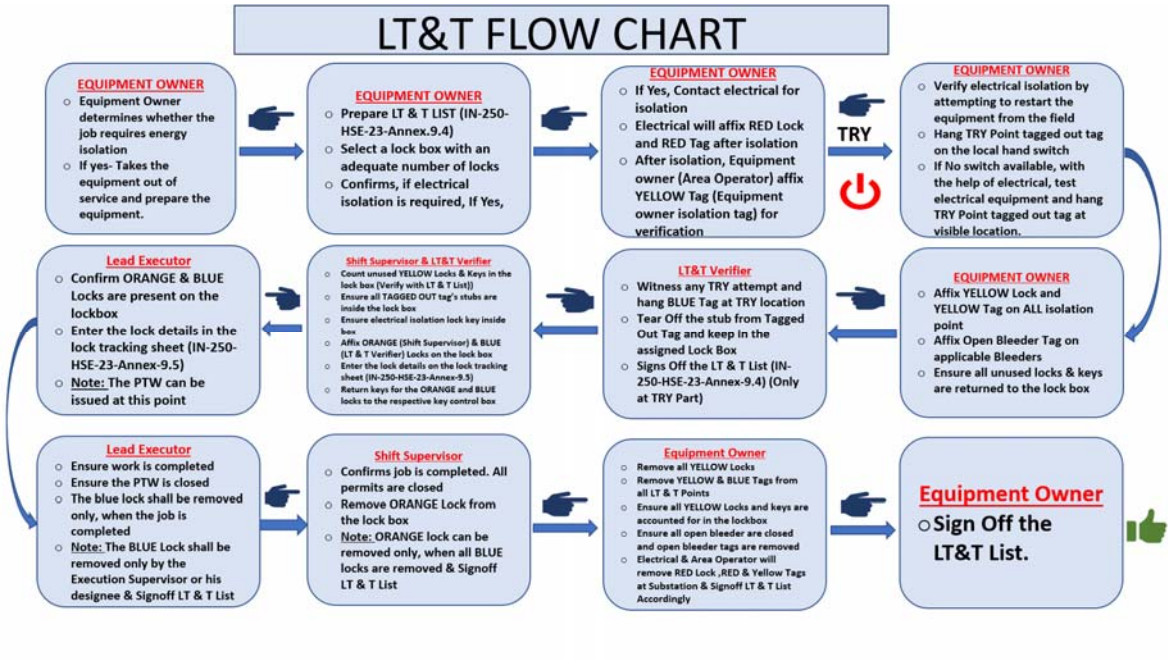
8 RECORDS

The following records shall be maintained in support of this Instruction:
The owner / executor of change shall maintain the following, but not limited to, records / documents for reference:

#	Record ID	Record name	Responsibility
1	NA	Master List for LT &T	Equipment Owner
2	NA	Closed LT & T list	Equipment Owner
3	NA	Emergency LT& T Removal form	Safety
4	NA	Partial LT & T Breakage form	Equipment Owner
5	NA	LT & T Audit Record	Safety/Owner Department
	NA	Training record for employee/contractor	L&D/ Contractor in charge

9 APPENDIX

9.1 LT&T FLOW CHART



9.2 Guidelines for the Use of an Actuated Valve as an Isolation Point for LT&T

Actuated valves (e.g. pneumatic, hydraulic, motor-operated, etc.) are generally prohibited for use as isolation points for LT&T unless the provisions of these s are complied with. When utilizing this procedure, the equipment owners shall identify all the actuated valves used as Isolation points and implement a plan, wherever possible to install manual valves in the appropriate locations to minimize repetitive use of the actuated valves as an isolation point

The equipment owner shall complete the following items:

1. A written hazard analysis from initial isolation through completion of return to service

2. A detailed written plan describing the entire energy isolation and return to service processes which includes:

   - All physical isolations and reversals;
   - All isolations and reversals of pneumatic, electronic, hydraulic or other control sources that may actuate an isolation valve;
   - All software, logic, or control sequence isolations and reversals;

   Following points may be considered for hazard analysis and written plan.

1. All the energy source(s) necessary for actuation of the valve are physically disconnected and locked out.

2. Install a blind separating the actuated valve from the equipment to be opened or identify other engineering and administrative controls that support not installing a blind.
3. Any valve with an actuator powered by pneumatic, electrical, hydraulic, or other motive force is considered an actuated valve, even if it has a hand jack/disengaging gear/manual override

4. The hazard analysis and written plan can be used for subsequent isolations of the same actuated valve. Any change in the sequence or method need approval from concerned people.

5. Physical disconnect of instrument air tubing is required for each air operated actuated valve utilized for isolation for line opening and must be included in the written plan.

6. Each instrument air isolation points (i.e., valves) shall be included in the LT&T list.

Note: Closing and locking out the instrument air supply without physical disconnect does not meet the requirements of this s.

7. If more than one actuated valve is required for isolation for line opening, the sequence of isolating multiple actuated valves shall be determined in the written hazard analysis and detailed written plan

8. For an actuated valve that is fail-closed or fail-last, use of a restraining device does not eliminate the requirement to physically disconnect the motive force to the actuator.

9. For actuated valves that are fail-open, extreme caution must be exercised when using a fail-open actuated valve isolation for line opening purposes. The written hazard analysis and detailed written plan must include explicit instructions of how to properly manage and sequence the isolation of the fail-open actuated valve, including use of an engineered restraint.

Note: For an actuated valve that is fail-open, disconnecting the motive force cannot be a step in the written plan

9.3 HANDLING OF MULTIPLE LOCK BOXES

Handling of Multiple Lock Boxes within Unit

Any job that requires more than one lock box can be handled as follow:

As an example, if job within unit that requires using lock box # A, B & C then:

i. Perform LT&T of the system per isolation list of lock box-A.

a) Have orange lock installed on it.

b) Have blue lock installed on it by Lead Executor after doing verification of isolation points.

ii. Perform LT&T of the system per isolation list of lock Box-B.

a) Have orange lock installed on it.

b) Have blue lock installed on it by Lead Executor after doing verification of isolation points.

iii. Perform LT&T of the system per isolation list of lock box-C.

a) Have orange lock installed on it.

b) Have blue lock installed on it by Lead Executor after doing verification of isolation points.

iv. Equipment owner wishing to get work done on common system shall provide lock box –D (can be named as multiple lock box coordination box).

v. Isolation list for lock box-D should include lock box –A, lock box-B & lock box-C as isolation points.

vi. Lead Executor wishing to work on common system which involves lock boxes A, B & C should verify that there are orange Locks & blue locks installed on lock boxes A, B & C. That will ensure that entire system is under LT&T and then he can sign in on the isolation list for lock box-D.

vii. Equipment owner now puts all the orange keys of lock box-A, B and C into lock box-D and provides one orange lock on it. Key for this orange lock of lock box–D is then secured in orange lock control box which is located in Shift Supervisor office.

viii. Lead Executor who verified the isolation list of lock Box-D now shall provide blue lock on lock Box-D and secures blue lock key in blue lock control box which is located in Execution Supervisor office

ix. Lead Executor wishing to work on common system shall put his/her LT&T ID on lock box-D.

x. In the event of partial LT&T breakage requirement; Equipment owner and Lead Executor shall apply Partial LT&T breakage procedure for lock box-D and have the orange key removed of the affected lock box and then again perform partial LT&T breakage procedure for that respective affected lock box.

NOTE 11
Equipment owner can use any spare orange lock box as lock box-D leaving all the locks either within in it or taken out and secured.

9.4 LT & T LIST

	SAFETY	Rev. 1
	LT&T LIST	01-Oct-2018

Date :	Unit :	Area :	Lock Box # :
Job Scope :			Equipment #:
LT&T Verifier Name:	Discipline/ Area Assigned :	Emp. #	Blue Lock key Location: In Possession ☐ In Key Box ☐

Section 1 : Energy Control Isolation Points			Verified - Isolation Carried Out				Verified - Lockout & Tag Out Devices Removed	
			Equipment Owner		LT&T Verifier(Only on Try Part)		Equipment Owner	
Isolation Point # -	P&ID #	Isolation Point Description	Date	Name	Date	Name	Date	Name

Section 2 : Open Bleeder Tags			Equipment Owner		LT&T Verifier		Equipment Owner	
Bleeder Point #	P&ID #	Bleeder Point Description	Date	Name	Date	Name	Date	Name

Is there a blinding job related with this isolation? Yes ☐ No ☐

☐ Certified that affected and authorized employees are instructed on the purpose and use of Energy Control Procedure

Name of the Supervisor : _____ Signature _____ Date : _____

9.5 LOCK TRACKING SHEET

	SAFETY	
		Rev. 2
	Lock Tracking Sheet	**05-07-2020**

Department	Permit Number	Lock Color	Lock Number	Locked By	File Number	Date	Work Completed By	Date	Lock Removed By	Date

9.6 PARTIAL LT & T BREAKAGE LIST

Date:	**Unit:**	**Area:**	**Equipment #**	**Lock Box #**
Job Scope:				
LT&T Verifier's Name: **Discipline/Area Assigned:** **Emp. #**				
Blue Lock key Location: In Possession ☐ In Key Box ☐			Blue Lock Key Location: In Possession ☐ In Key Box ☐ (After Partial LT&T Breakage)	

Equipment Owner			LT&T Verification				Lock Opening Verification				Lock reinstalling Verification				Lock reinstalling not required			
			Equipment Owner		LT&T vérifier		Equipment Owner		LT&T Verifier		Equipment Owner		LT&T Verifier		Equipment Owner		LT&T Verifier	
Isolation Point #	P&ID #	Isolation Point Description	Date	Sign	date	Sign	Date	Sign	Date	Sign	Date	Sign	Date	Sign	Date	Sign	Date	Sign

Approved by Shift Supervisor or his designee: _____ Date: _____

9.7 LT&T REMOVAL FORM (If Lock not Opening OR Key Lost)

Section A: Originator Information (completed by Originator)		
Name:	Signature:	Emp. Number:
Unit:	Radio:	Date:
Lockbox Number:	Lock Number:	Time:

Section B: Job Information (completed by Originator)	
Location / Equipment:	Job / WO No.
Job / LT&T Description:	

Section C: LT&T Locks and Tags to be Removed (completed by Originator)

	Yes	No	Comments
1. LT&T Supervisor ORANGE LOCK	☐	☐	
2. Production / Equipment Owner YELLOW LOCK	☐	☐	
3. Execution Verifier BLUE LOCK	☐	☐	
4. Electrical RED LOCK	☐	☐	

Section D: Approvals

The LT&T locks and tags can be removed only after the Production, Maintenance and Safety all agree that a thorough inspection has been done and conditions are safe to remove the lock and/or tag.

	Print Name	Signature
Unit Operator		
Unit Supervisor		
Execution Supervisor / Lead Executor		
Fire and Safety Coordinator (FSC)		

Section E: Safety Section Use Only (completed by Safety Rep or FSS)

	Yes	No	Comments
1. Lock removed by using a SPARE KEY (returned)	☐	☐	
2. Duplicate key was permanently issued	☐	☐	
3. Lock was removed by cutting the shackle	☐	☐	

Notes:

*** Fire & Safety Coordinator is the only Authorized Person to cut a LT&T Lock**
*** Return this approved form to the Safety Section**

9.8 PARTIAL LT & T APPROVAL FORM

Equipment Owner Name:		**Emp. #:**		**Date of Request:**
Time Limitation:	**From Time:**	**Date:**	**To Time:**	**Date:**
Equipment #:		**Lock Box #:**		**Unit:**
Original Job Scope:				
Reason for Partial LT&T Breakage:				
Additional Safety Precautions and Safeguards Planned:				
APPROVALS				
Affected Unit Supervisor	**Name** _____	**Sign:** _____	**Date:** _____	
Maintenance Representative	**Name** _____	**Sign:** _____	**Date:** _____	
Safety Representative	**Name** _____	**Sign:** _____	**Date:** _____	

Note: Attach approved form to the lockbox until the job is complete.

9.9 LT & T AUDIT CHECKLIST

Date:	
Department	
Specific Equipment Number:	
Name of the person audited :	

Questions	Yes	No
Are all affected and authorized employees trained in the energy isolation procedure?		
Are all energy sources identified and properly isolated? (Physically verify)		
Are locks, tags, and other lockout / tag out devices installed properly? (Physically verify)		
Are tags legible and understandable?		
Have authorized employees verified that the equipment cannot be energized?		
Have any deviations/deficiencies from the established procedures been observed?		
Are "try" locations indicated on the LT&T list?		
Do the isolation point numbers on the LT&T tags correspond to the numbers on the LT&T list?		
Are the bleeders listed in the LT&T list open and tagged?		
Is the LT&T list approved by the shift supervisor or his/her designee (second person)?		
Is the second person a certified area operator or an equipment owner supervisor?		
Is the second person not the one installing the LT&T?		
Is the method of isolation appropriate for the type of work e.g. blind or drop-out spool for CSE		
Does each Lead Executor working on the system have attended the training on LT&T ?		
Does Lead Executor has entered the lock details in the lock control detail list ?		

Describe any deviations/deficiencies:	
1	
2	
3	

What actions have been taken to correct any deviations/deficiencies?		Action Owner
1		
2		
3		

☐ Review conducted between auditors and each authorized employee of the employee's responsibilities under the energy control procedure being inspected

Auditors			
Name	Signature	Name	Signature

9.10 HAZARD EVALUATION FOR ISOLATION WITH ACTUATOR VALVE

Date:	Unit:	Area:
System/Equipment Isolated:		
Work/Activity:		
Number of Actuated Valves Involved:	Team Members	
Tag Number:	1.	
	2.	
	3.	

Task/Activity (What are the general steps?)	**Hazards/Potential Incidents** (What can go wrong? What scenarios can result in untoward events? What errors/failures can lead to significant consequences?)	**Mitigation** (What measures are in place to eliminate or mitigate the hazards?
Isolation		
• Isolation of actuated valves		
• Isolation of manual valves		
• Racking out breakers		
• Application of LT&T		
Line Opening		
• First break		
• Equipment removal		
Box-Up		
• Boxing-up lines		
• Reinstating equipment		
Return to Service		
• Purging		
• Removal of LT&T		
• Lining up manual valves		
• Lining up actuated valves		

NOTES:

1. Review task categories and add any other task that is not listed.
2. Review each task and identify hazards and potential incidents which could have significant consequences. Brainstorm what-if scenarios to determine the impact of equipment failure and/or human error during the activity.
3. For every hazard or potential incident, identify and implement mitigating measures. Ensure that these measures completely mitigate the consequence and do not pose an additional risk.

9.11 WRITTEN PLAN FOR ISOLATION INVOLVING ACTUATED VALVES

Date:	**Unit:**	**Area:**
System/Equipment Isolated:		
Work/Activity:		
Number of Actuated Valves Involved:		
Tag Numbers:		

Step Description	**Yes/No**
NOTE: Where multiple actuated valves are involved, list down and repeat steps for each valve.	
1. Verify impact of (valve tag number) isolation on interlocks and process control sequences.	
2. Ensure impacts from above are mitigated and communicated to affected personnel.	
3. Isolate (valve tag number) from the interlock and/or process logic.	
4. Isolate the energy source to (valve tag number).	
5. Physically disconnect and lock-out the energy source to (valve tag number).	
6. Where applicable, install physical restraint on the valve.	
7. "Try" and ensure valve will not move.	
8. Isolate manual valves as per the isolation list.	
9. Install blind downstream of (valve tag number) to separate it from the equipment to be opened.	
10. After completing the activity, box-up all lines, vessels, and other equipment.	
11. Remove any other blind installed in the system except for those downstream of the actuated valves.	
12. Perform purging as required.	
13. Close all vents, drains, and bleeders in the system.	
NOTE: Where multiple actuated valves are involved, list down and repeat step 1-9 for each valve.	
14. Where applicable, remove physical restraint from (valve tag number).	
15. Physically reconnect energy source to (valve tag number).	
16. Remove LT&T from the energy source to (valve tag number).	
17. Line-up energy source to (valve tag number).	
18. Restore (valve tag number) to its normal process control configuration	

Sign Shift Supervisor/Prod Engineer …… **Principal Engineer……**