

GUIDE

LOCK OUT | TAG OUT (LOTO)

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1. Purpose

This instruction has been prepared as a Guideline and it describes the minimum requirements of the locking/tagging program (LOTO) of ACCIONA's Energy Division, with the purpose of establishing the guidelines for the complete isolation of energy during the operation and maintenance of equipment, processes or circuits, with the purpose of preventing incidents for own or hired staff.

The LOTO system (acronym for Lock Out – Tag Out) is part of the Five Golden Rules, as described later on.

The LOTO system includes any type of energy, i.e., it is not solely limited to electrical energy but also includes other sources, such as potential (sudden element drop), elastic (spring activation) and hydraulic energy (escape of pressurised fluids), among other types of energy.

This instruction describes the minimum requirements, i.e., it must be followed by Companies with more restrictive legal requirements or more detailed and/or complex common practices.

2. Scope

This instruction is applicable to the staff of ACCIONA's Energy Division, regardless of their hierarchical position in the organisation and nature of their contract. Likewise, it is applicable to contractors and visitors affected by the same circumstances.

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3. Definitions

- **LOTO (Locking/Identification):** Process that must be followed to attach a lock and tag on a device that must be isolated, in order to prevent its unexpected start-up or release of hazardous energy. The presence of a tag and lock shows that the device is isolated and that it must not be used until the lock or tag is removed.
- **Affected Employee:** An Employee handling or working with interlocked and/or marked equipment or performing a task in an area affected by an interlocked and/or marked unit.
- **Authorised Employee:** This document describes an Authorised employee as a person who locks and/or attaches a tag to equipment or installations (do not confuse with the same term used, for example, in the Spanish regulations related to Work in Installations with Voltages).
- **Employee Responsible for the De-energization Process:** This document describes this employee as the person who activates the Energy Isolation Device of a unit (for example, a switch). The same employee can act as the Employee Responsible for the De-energization Process and Authorised Employee when the duties of the Authorised Employee include the de-energization and locking of the unit.
- **Authorised Manager:** The Authorised Employee that is mainly responsible for the implementation and coordination of activities related to the LOTO procedure in case of multiple locking procedures.
- **De-energized Equipment:** Physically isolated from any source of energy, including the absence of residual or stored energy. The effective absence of energy must be checked before the equipment can be considered as such.
- **Protection Zone (PZO):** Safe limit under which the work can be carried out safely and which has required the isolation, de-energization and tagging of the sources of energy.
- **Energy Isolation Device:** A mechanical device that physically prevents the transmission or release of energy, such as, for example: a manually operated electrical circuit breaker, line breaker, sliding door, sliding shield, screw-down valve, lock or any other similar device used to isolate energy. The term does not include push-buttons, selector switches or other devices of the control circuit type.
- **LOTO Locking Device:** A mechanical element that has been designed to guarantee that the Energy Isolation Device is in a safe position, in addition to allowing the use of a Lock to control its removal.
- **Universal LOTO Lock:** A lock that is not assigned to individual employees. This lock only has one key and no master keys are available. This lock can be used for individual locking purposes when a group locking system is used. This lock can be left on equipment during more than one shift. This type of lock can only be used for the functions described in this LOTO procedure.
- **Individual LOTO Lock:** A lock assigned to individual Employees, with the purpose of implementing this LOTO procedure. These individual locks will be red and can be customised with the name of the Employee, depending on whether they have been handed over to the employee for their permanent use or they have been lent for a determined task or for a determined period of time. In any case, locks will only have one exclusive key.

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- **Red Tag "DANGER-DO NOT OPERATE"**: Red tags are used as a personal protection complement for staff working with locked equipment, warning them about existing risks and the exceptional situation associated to the unit. The tags do not offer protection functions, so they must be attached with the corresponding LOTO locking device, physical disconnection or equivalent protection element.
Tags must have diagonal red and white lines, be resistant to outdoor conditions and be firmly attached to the unit.
The design of the Red Tag must comply with the specifications described in Appendix A01_GAE07036.
- **Yellow Tag "CAUTION-DO NOT OPERATE"**: Yellow Tags simply warn users about equipment or machines that are out of service and must not be operated. They can be used on machines that have not been operated during a long period of time. These tags are not used as equipment locking systems. Any operator that must handle a unit marked with this tag must lock the energy isolation devices with a lock and use the corresponding Red Tags. This Tag does not have to be used with a Lock.
The design of the Yellow Tag must comply with the specifications described in Appendix A01_GAE07036.
- **Transition Lock**: This is the only type of lock that can be used with various keys and is used on equipment or in processes that are not actively being repaired. Control or access to these keys must be limited to a small number of Authorised Employees. This lock must be used in combination with the Transition Tag "Caution-Do Not Use This Machine" to warn about its unsafe condition. This lock must not be used as an individual LOTO lock and can never be used on active equipment in service.
- **Transition Tag "WARNING-DO NOT USE THIS MACHINE"** (Yellow striped tag): Transition Tags are used on Transition Locks, as tags or warning of the exceptional system applied to the locked unit. They can not be used to replace Red Tags with Individual Locks or as Yellow Tags (which do not require the use of a lock).
Transition Tags must be yellow with black diagonal lines, resistant to outdoor conditions and firmly attached to the unit.
The design of the Transition Tag must comply with the specifications described in Appendix A01_GAE07036.

4. Locking/Tagging

4.1. Five Golden Rules and LOTO

Follow the Five Golden Rules to guarantee the full isolation of energy sources:






- 1) Shut down the energy supply.
- 2) Lock all switches in the open position.
- 3) Make sure there is no voltage.
- 4) Ground and short-circuit.
- 5) Protect against nearby power supply sources and mark the work area with signs.

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The LOTO procedure is related to the second rule of the Five Golden Rules.

1	2	3	4	5
Shut down the energy supply.	Lock all switches in the open position.	Make sure there is no voltage.	Ground and short-circuit	Protect against nearby power supply sources and mark the work area with signs.
				

Source: www.catuelec.com

4.2. General Standards

No device will be handled while the locks and tags are in place, except in the following cases:

- The Authorised Employee checks the lock.
- The Authorised Employee improves the isolation characteristics.
- The Authorised Employee modifies the tag on the unit.

All tags must include the following information:

- Date.
- Position or status of the locked element.
- Name of the employee.
- Contact details.

The lock must be placed on the component being locked or on an element closest to this component, so that the point being locked can be easily identified. In general, temporary locking devices that can not be easily removed will be used. The use of permanent locking devices must be authorised by the Engineering area.

Marking an area as "PZO" does not directly imply that any operation can be carried out within the zone, since it will be associated to the corresponding assessment of risks and a safe instruction, as in any other case. For example, the measurement of environmental conditions related to Confined Spaces might be required in addition to the LOTO procedure.

All LOTO Locks must be checked to guarantee the effective isolation from all hazardous sources of energy.

The verification of the effective isolation of all sources of energy is the expected and preferred method. When this is not possible, an alternative work procedure will be followed, which must be documented and approved.

LOTO Locks and Tags must be used when repairing or servicing a unit or during any other type of work that represents a hazard to the worker in case the machine or system is suddenly activated or stored energy is released.

All identified sources of energy must be disconnected turned off, with no access, locked and tagged.

Red Tags will be used with LOTO Locks (Universal or Individual) and must be placed on the Energy Isolation Device (by the Employee Responsible for the Energy De-energization Process) with all associated locks, such as "locking boxes" (by Authorised Employees).

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Each Authorised Employee can use its own Red Tag and Individual LOTO Lock. The fields on all Red Tags will be filled in and legible.

Red Tags and the elements used to attach them to other units in case they are not of the single format type must be resistant to environmental conditions and designed so that a strength of at least 22 kg (50 lbs) is required to release them. Tags can be written with permanent markers that can be cleaned with alcohol, so they can be reused.

Authorised Employees will receive Locks and Tags required for their everyday work and can also use Universal LOTO Locks (for example, located in a "LOTO Centre") that will be considered as Individual LOTO Locks when they are loaned to these employees for a determined period of time.

LOTO Locks must not be of the conventional type and they must be marked with a serial number and identified as such. They will be assigned to individual employees (either permanently or loaned for a period of time, in the case of Universal LOTO Locks).

LOTO Locks will be designed so that excessive strength or the use of special tools is not required to remove them (they are not anti-intruder security elements). They will be built with materials that resist environmental conditions.

Each lock will have a single key. The use of spare keys is strictly prohibited. In case a key is lost, the lock must be removed and a new one must be requested.

No master keys will be used, except for a single key for a group of Individual Locks assigned to a single specific Employee, so that a different set of keys is not required to open his own personal locks.

The LOTO Locking Devices used to lock the source of energy and the corresponding Lock will be manufactured in a material that withstands outdoor conditions and their design will make sure that these devices can not be bypassed.

LOTO Locks and Red Tags can only be removed by the Authorised Employee that placed them.

Change in Shift or Work Transition: The LOTO lock can be used for a maximum of one shift or while the task is being carried out (the shortest of the two).

In case the work continues during the next shift, the Authorised Employee must install his Locks and Tags in the presence of the Authorised Employee ending his shift, who must remove his tags and locks before abandoning the installations.

Transition Locks are an alternative that has been approved for its use in place of the direct replacement of Individual Locks when there is a period of time during which a system is locked and no staff is present. The use of Transition Locks shows that the system is unsafe for operation and it guarantees the compliance with the LOTO procedure during this transition interval.

Transition Locks must be used with the corresponding Transition Tags (Yellow Tags with black diagonal lines). No other Tag can be used with Transition Locks.

Transition Locks and Tags can not be used for any other purpose than Transition LOTO Locking. They can not be used as Individual Locks.

Access to Transition Locks and Tags is exclusively controlled by a reduced group of Authorised Employees.

When the person that attached the Lock and Tag is not present to remove these elements, the lock can only be removed under the orders of the person authorised by him and who has enough knowledge about the equipment and work being carried out.

The employee must make sure that it is safe to remove the Tag or Lock before doing so. If necessary, the employee will call the Employee's house number to make sure that he is not working in a danger zone.

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He must fill in format F01_GAE07036 to document the exceptional procedure and the measures that were adopted.

Lock shears or similar devices can be used. The use of "master" keys or copies of the Individual Lock keys is strictly prohibited. Any copy of a key received with the lock from the factory must be destroyed before the equipment is handed over to the employee with the corresponding personal protective equipment.

Notify the installation's supervisor and available prevention staff after a LOTO Tag or Lock has been removed with these devices. Likewise, the employees whose Locks and/or Tags have been removed with these procedures must be notified by their immediate supervisors before returning to work.

All new equipment acquired by ACCIONA Energía will be designed so that this LOTO Procedure can be applied.

The Installation's Supervisor is responsible for guaranteeing that the necessary equipment and devices are available to apply this LOTO procedure, for example:

- Red Tags
- Yellow Tags
- Transition Tags
- Individual LOTO Locks
- Universal LOTO Locks
- Transition Locks
- Electrical Energy Locking Devices
- Hydraulic Energy Locking Devices
- Pneumatic Energy Locking Devices
- Locking box groups

4.3. Specific Instructions for LOTO equipment

Preferably and whenever possible, any intervention on equipment or the installation will entail the preparation of Specific LOTO Instructions as a preventive measure, which must include the identification of the sources of energy with a potential risk, the location of Energy Isolation Devices, ideal Locking Devices in specific cases, etc.

The Instruction and Equipment or Energy Isolation Device codes must be traceable whenever possible, so that this facilitates their search in the documentation data bases.

Appendix F02_GAE07036 includes a model or template that describes how these Specific LOTO Instructions must be followed.

Specific LOTO instructions are drafted in the local language and will be translated into English when they are to be used for similar work in other countries, as an exercise for the exchange of good practices and for the homogenisation of work procedures.

These must include the following, regardless of the format used:

- Common name of the equipment.
- Location of the equipment.
- Magnitude of the energy (in other words, the power in watts or the pressure in bar/p.s.i) supplied to the equipment.
- Exact location of the equipment's power supply source.
- A description of how energy must be isolated from the equipment (including the types of Locking Devices used).
- Date of the Instruction's last revision.
- Name of the person editing the Instruction.

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Specific LOTO Instructions will be reviewed in accordance with the country's legislation and preferably once a year and by an authorised person.

4.4. Additional requirements

Devices that can not be locked: The risk assessment must state what Energy Isolation Devices can not be locked with a LOTO system.

In these cases, the Red Tags will be used to warn about the exceptional risk situation, regardless of the alternative method that is approved.

Examples of alternative measures (only authorised when the Isolation Device can not be locked): removing fuses, locking control switches, opening additional disconnection devices or removing a valve handle.

All Authorised Employees must be trained to understand the limitations of these exceptional situations.

These exceptional situations where only a Red Tag is used must be documented in the corresponding Specific LOTO Instruction, as in the case of Locks (depending on the procedure).

Locks with various Employees: In case various persons must work on the same equipment or system, a Main Supervisor of the work will be appointed ("Authorised Manager"), who will be responsible for coordinating the correct locking and tagging procedures carried out by all Authorised Employees.

Multiple LOTO Locking Devices: A "Multiple LOTO Locking Device" must be used when more than one person is working on a unit or area and the Locking Device can not accept more than one LOTO Lock. This might require the use of a LOTO Jaw for various Locks or a LOTO Locking Box (there are various conventional designs in the market, but specific solutions can be used when they follow the same operating concept).

LOTO Locking Box: LOTO Locking Boxes can be very useful when various Authorised Employees, professionals and companies are working within the same PZO at the same time. In any case, the following must be taken into account:

- The Authorised Manager will make sure that each source of energy has been locked, using the necessary Locks and Tags.
- The Authorised Manager will insert the key(s) into the Locking Box (as needed), locking the Box with one of the Individual Locks.
- Each Authorised Employee will use their own Individual Lock and Red Tag on the Locking Box, so that it can not be opened while one of this Locks is on.
- Each Authorised Employee will remove their Individual Locks and Red Tags from the Locking Box after the work at the installation is complete.
- The Authorised Manager can open the Locking Box and take the key(s) that were deposited there after making sure that the installation is in safe conditions.
- The Authorised Manager can then remove all Locks, Locking Devices and Tags after a final verification and after making sure that no employee is exposed to the risks.

Temporary Lock Overriding: In case the Lock must be overridden in an installation before continuing with the work (for example, during tests or when starting a unit), the Authorised Employee will follow these steps:

- Study the work area to make sure that the installation's components do not represent a risk after being started (for example, they are not loose or can not be projected).
- Notify all workers within the area that the locks are going to be removed, making sure that all workers abandon the PZO and are in a safe area after these procedures.
- Make sure that the controls are in the "off" or "safe" position.
- Remove Locks and Tags.

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- Energize when needed and continue with the task that required the temporary equipment lock.
- After completing the temporary intervention, de-energize the system again, make sure there is no energy and apply the LOTO procedure again until the maintenance or repair task is complete.

Alternative methods

Alternative Methods to the LOTO Procedure can be followed to control energy when the tasks carried out on equipment are of the routine or repetitive type. These alternative methods must be assessed with the corresponding Risk Assessment.

Examples of tasks that allow the application of alternative methods to the LOTO procedure: Minor modifications to tools and/or adjustments, preparation, unlocking, location of parts and routine cleaning. In any case, the LOTO procedure must be applied in the following cases:

- When protection elements have been overridden or removed.
- Any part of the workers body must be inside the operating area of the machine, equipment, process or circuit.
- No Alternative Method has been assigned to the task, or
- No specific information has been received in relation to the task.

Contractors or other external staff

Contractors must check this procedure and all applicable Specific Instructions. Likewise, they must comply with the safety requirements established in the LOTO program before starting any type of work that involves the presence of hazardous or stored energy.

Plugs and equipment with cables

A LOTO Lock or Tag does not have to be placed on equipment being handled that has a plug or cable after it has been switched off and disconnected **in the following cases**:

- The cable is visible and under the exclusive control of the Authorised Employee.
- The equipment's plug and cable have a single source of electrical energy.

The plug must be locked and a Red Tag must be connected to the plug in case one or both of the conditions described above are not met.

5. Training

Authorised Employees must receive specific training, which involves the following:

- Identification of LOTO situations;
- Assessment of Risks related to LOTO situations;
- Requirements associated to this document.

Training will be registered in the corresponding data base and employees participating in the training activities must pass a test to check their level of knowledge.

This type of training for Authorised Employees is vital to train them as such and theory-practical retraining courses will be prepared every two years (registered in the corresponding data base).

In addition, retraining courses are required in the following cases:

- When the results of the inspections detect that the employee does not have the adequate knowledge about the program.
- When there are changes in workers' responsibilities.
- When there are new/replaced machines, equipment or processes with an associated new risk in relation to LOTO.
- When there are changes to the LOTO procedure.

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Affected Employees must be trained on the prohibition to start locked and/or tagged equipment and so they can identify the situations where they must also lock and/or tag a Locking Device. These training procedures must be documented in the corresponding data base.

Training courses will be repeated in the following cases:

- When the results of the inspections detect that the employee does not have the adequate knowledge about the program.
- When there are changes in workers' responsibilities.
- When there are new/replaced machines, equipment or processes with an associated new risk in relation to LOTO.
- When there are changes to the LOTO procedure.

All of the **Installation's Employees** will receive general training on LOTO procedures, with the purpose of making sure that all understand the safety function of Locks and Tags. Employees must also be trained on the prohibition of starting locked equipment. These training procedures will be included in the QSE training plan and registered in the corresponding data base.

The subcontracted staff training procedures related to LOTO requirements will be included in the Business Activity Coordination process applied to each specific case.

6. Audit

All requirements described in this document will be audited in an annual audit for each installation (it does not has to be an exclusive audit and other QSE audits or inspections can be carried out at the same time). All corrective actions detected during these audits must be registered in the Non-Conformity data base.

7. Related documentation

Code	Title
A01_GAE07036	LOTO Tag Models
F02_GAE07036	Template used to prepare Specific LOTO Instructions
F01_GAE07036	Format used to remove a LOTO Lock/Tag in the absence of the Employee

NOTE: Consult the applicable documentation associated to each technology in the System Map.

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