

SAFETY REGULATION VV 09	
Locking installations	Balen/Pelt

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1. Subject

This procedure describes the uniform system for systematically and safely working on installations. In this way, we want to prevent people from being exposed to dangerous situations such as the unwanted activation of installations. This concerns energy that can be released by electrically driven equipment, hydraulic and pneumatic systems and equipment, potential energy in the form of fall energy and pipes that are under pressure or contain a (hazardous) substance that can possibly be released.

Prior to the work, both the provider of the work permit and the holder must test the effectiveness of the isolation.

2. Scope and exceptions

This procedure in this regulation is generally valid for all work on or in the installations of Nyrstar Balen and Overpelt.

2.1. Aggravation of requirements:

- The application of a complete physical isolation to substances that are not described in the procedure is an authority of the department management. The latter ensures that these exceptions are recorded, archived and instructed in writing by means of a department list. This department list is then binding and must be followed up.
- When working on systems that are fed by thermal, harmful chemical (carcinogens - mutants - irritant - ...) or biological products, the provider must provide guidance during first opening

2.2. Exceptions and situations

2.2.1. Exceptions:

The isolation procedure does not apply in the following situations:

- Pipes with water as a medium with a maximum of 4 bar pressure and a temperature <50°C.
- Compressed air pipes with a pressure of <6 bar. → Valve closed.

2.2.2. Deviations:

In situations where not all isolation measures can be taken in accordance with the described definitions, the department management must decide on the acceptability of the risk and any alternative/additional safety and control measures (e.g. PPE). This power cannot be delegated to subordinates. The decision must be recorded in writing.

2.3. Alternatives:

The method described in this procedure may be deviated from if a written method (procedure) with the same level of protection is provided for. This procedure must then be classified as 'critical' and explicitly mentioned on the work permit or lock checklist. A Task Risk Analysis must also have been carried out and the employees must be demonstrably instructed.

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3. Links

Document description	Document no.
Work permit	XP-452-VV-0-00000
Lock form	XF-452-FCH-0-00009
Request document removing locks	XF-431-FREQ-0-00001
Lock box on location	XF-452-FREC-0-00002

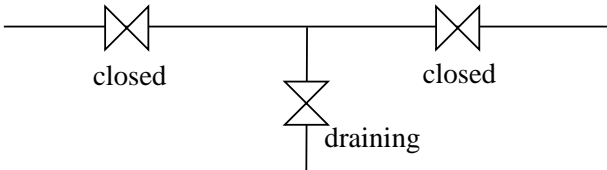
4. Definitions

Involved employee Operator/isolation coördinator	An employee whose job requires him to operate or use a machine or equipment on which servicing or maintenance is being performed under lock out and tag out conditions, or his job requires him to work in an area where such servicing or maintenance is being performed.
Authorized employee (Coordinating) executor	An employee who applies his personal lock to a machine or installation to perform maintenance or inspection on that machine or installation. An operator becomes an authorised employee when he is also allowed to carry out maintenance or interventions. Executor(s) (asset or contractors) of the work after securing
Lockout Planner	The one in charge of the planning and documentation of complex isolation. The role of lockout planner can be fulfilled by sufficient and demonstrably instructed persons (team leader, 1st operator), appointed by the department management.
Permit provider	Is the provider of the work permit. Trained person (team leader or 1st operator) who gives the release to the executor(s) to start the work.
Isolation coördinator	Trained person (team leader or trained operator) who locks the installation, he may not act as an inspector.
Authorized isolation employee	Asset employees who can demonstrate through experience or training that they have sufficient knowledge of the installation and are aware of the dangers present during intervention, indicated by the department and able to carry out certain interventions.
Inspector	Trained person (team leader or trained operator) who verifies the applied lock outs of a complex lock.
Lock out	The placement of locking devices on a energy isolating device, in accordance with an existing isolating sheet to ensure that the lock cannot be lifted until the latch is removed
Isolation	Is the set of measures required to work safely on an installation or part of it: = Switch off, neutralize, apply lock-outs, label, test

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Zero Energy State	A situation where the installation is completely energy-free.
Isolation board	A location where all lock sheets of a department are kept and visualized.
Equipment Isolation Sheet	Is a written document that identifies all energy sources and all locking devices. This includes the method of locking efficiently to ensure that the installation is energy-free.
Declaration working under non-energy-free conditions	A declaration affixed to the locking board describing the installation and locking in question which has been temporarily unlocked in order to carry out adjustment, testing or positioning work. This declaration shall also state the name of the person coordinating the works. See section 7.5
Check	Intended to confirm that: <ul style="list-style-type: none"> • The lock form is filled in correctly • All energy sources are correctly locked • Tested • The installation is energy-free
Tag out	The placement of a label or attachment on a separator device, in accordance with an existing locking sheet to indicate that the latch should not be lifted until the label is removed
Test	Confirm that the entire installation is energy-free.
Energy source	Any energy source, electrical, mechanical, hydraulic, pneumatic, chemical, heat, gravity, spring power, etc..
Unlock	All the measures required to safely put an installation or component back into service = Removing lock-outs + labels
Unlocker	Trained person (team leader or trained operator) who unlocks the installation
Lockinghardware	A mechanical device that causes physical interruption of energy supply. This can be a manually operated switch, an interruption switch, a cut-off switch, a valve, block and bleed (see further clarification), a device that interrupts energy, etc... Controls switched in the steering circuit are not considered to be locking devices.
Disable & Neutralize	Stop supplying energy and remove residual energy. Piping: hazardous substances (gas, acid, leach, steam) = >Block & Bleed or blinding Non-dangerous/low pressure/low temp. (water mains < 4bar < 50°C) = > valve closed Tubs/settling tanks/reactors: as pipes: in case of entry Block & Bleed or blinding Devices Pump: pump motor working switch off + U&N pipes Machine: work switch off + securing moving parts, depositing compressed air, etc. Fan: drive work switch + fan lock High-risk devices also turn off power

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	<p>(e.g. high voltage drive, pulling fuses) Electricity see VV17 XP-452-VV-0-00017 Ionizing radiations see VV12 XP-452-VV-0-00012</p>
Block & Bleed	<p>see VV28: Two valves with the possibility to drain the intermediate pipe</p> 
Lockbox	<p>Lockable device to store keys, mandatory to use in complex locking and entry confined space. Lockbox is closed with a group lock + lock performers</p>
Simple lock out	<p>Locking of max. 3 lock-outs</p>
Complex lock out	<p>Locking from 4 lock-outs Always fill in an XF-452-FCH-0-00009 / Equipment Isolation Sheet. If there is none, a risk analysis must be made. Cross-departmental lockouts are always considered complex lockouts.</p>
Production slot	<p>Lock with yellow color coding applied by Isolation coördinator production</p>
Individual lock	<p>Lock with red color coding applied by executor Asset Red color-coded lock applied by production people during the performance of their duties</p>
Group lock	<p>Lock with green color coding applied to a lockbox by Isolation coördinator production</p>
Contractors lock	<p>Lock with blue color coding, identifiable to person and company applied by external contractor(s)</p>
Asset group lock	<p>Lock with black color coding, identifiably applied by asset or contractors to abandoned non-operational equipment</p>
Blue Lock-box	<p>Can only be used with "Lock-box on location"</p>
Sealing	<p>Device for sealing a lockbox to ensure that the lock remains intact for a longer period of time</p>

5. Responsibilities and powers

Teamleader	<p>Can bear multiple responsibilities depending on the sub-function. Isolation coördinator / Inspector / unlocker / lock planner / provider</p> <p>Works closely with the other parties involved in the lock procedure</p>
Employee concerned Operator/isolation coördinator	<p>Can bear multiple responsibilities depending on the sub-function. Isolation coördinator / Inspector / unlocker Works closely with the other parties involved within the locking procedure</p>

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Authorized employee
(Coordinating) Executor
(Asset / Contractors)

Convinces that the correct lock has been made and tests it before placing his padlock.
Places a personal lock on each lockout of a simple lock-out with regard to his work to be carried out. Places a personal lock on each lockbox with regard to his work to be carried out
Works closely with the other parties involved in the lock procedure

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6. Training

All employees and contractors with the exception of administrative staff must undergo specific training on locking installations. This training is documented and certificates are issued in Star Academy to the persons concerned.

- Affected employees (operators) and administrative staff receive appropriate formal training on the locking process. (training matrix module1 – level 0)
- Lock coordinators (team leader), executors and authorized isolation coördinator (asset) will receive specific training in relation to their role in the locking process. (training in Star Academy – training matrix level 1)
- Training on the job provided. (level 2)
- A test will be taken (in writing and possibly practically) to prove that the employee has sufficient knowledge and experience to be allowed to lock. Refresher training is provided every 3 years or when the procedure is adjusted. (training in Star Academy - training matrix level 3)
- Employees who are allowed to give TOJ and perform all the locks of their department (training matrix level 4)
- The department management keeps an up-to-date list of all persons who are allowed to lock to the various installations. (via Star Academy – training matrix level 0,1,2,3 and 4)

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7. Procedure

7.1 Systematics

Work may start as soon as all safety measures have been taken to ensure that there is no danger in any way due to the unforeseen release of energy.

In addition to the locking procedure, a work permit is completed with which the installation(s) is temporarily transferred to the executors of the work

Within the locking procedure we can distinguish 2 categories:

- Simple lock out
- Complex lock out

When performing a complex lock out, a locking checklist should be used. This checklist shows the correct procedure for securing an installation, the energy sources and the locking equipment. The lock checklist must state:

- **Schematic diagram or pictures identifying all the energy sources and the safe position are strongly recommended.** The diagram must include references and clear identification of the energy isolation points. (work switches, valves,...)
- Specific requirements for testing the installation to ensure that everything is energy-free.

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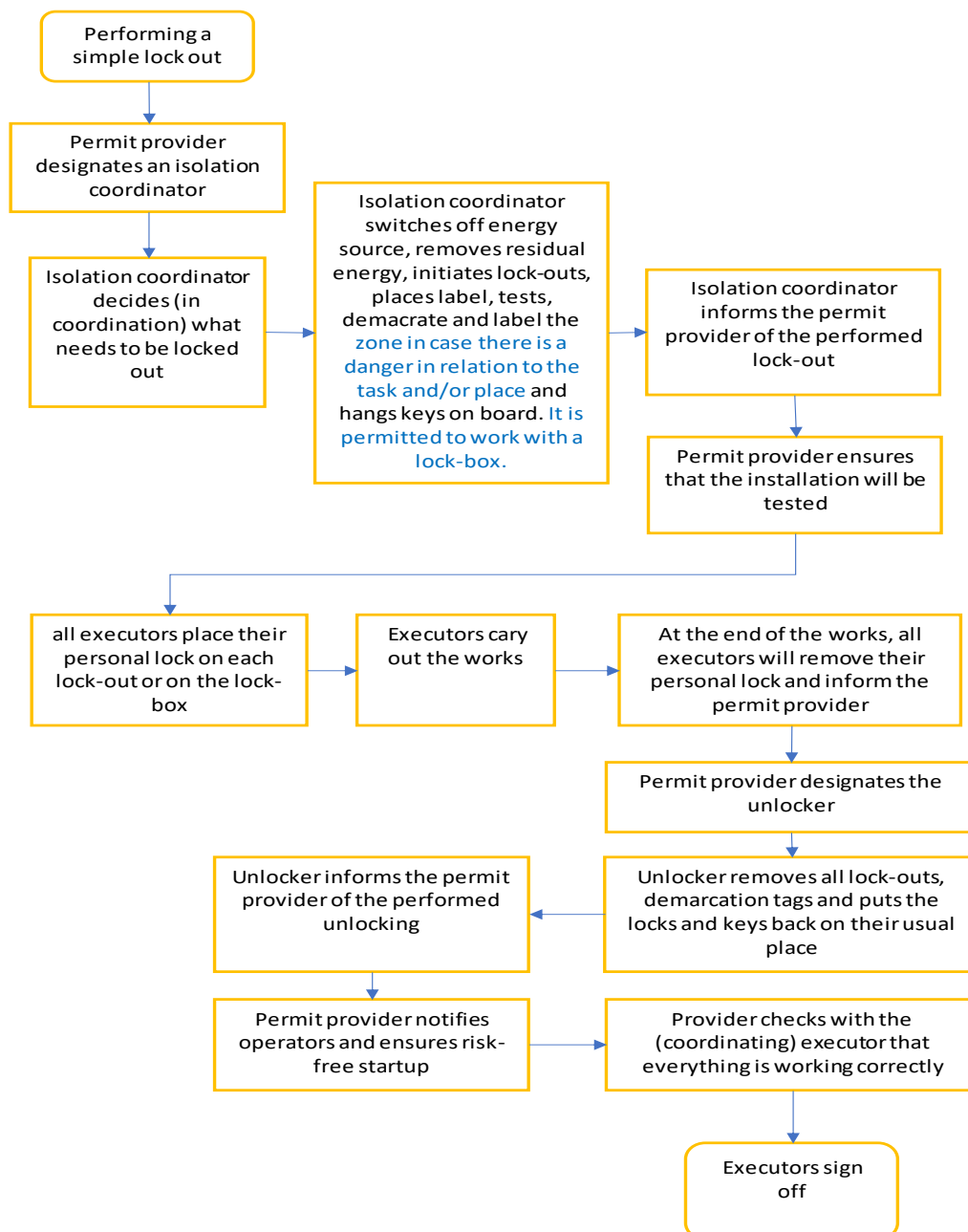
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7.2 Simple lock out

7.2.1 Flow



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7.2.2 Previous to the work

Permit Provider

- Designates an isolation coördinator and gives him additional explanation about the lock-outs to be carried out.
- Discusses with the coordinating executor where the lock-outs are or were applied.
- Is responsible for carrying out the test together with the coordinating executor(s). (the lock must be secured and the executor(s) must install their personal lock(s).)

Isolation coördinator

- Determines what needs to be locked (whether or not in consultation with the provider and/or coordinating executor)
- Switches off the energy sources
- Removes the residual energy present
- Applies the necessary lock-outs
- Places a label on the lock-outs, unless the locks used have a unique number traceable to the respective lock
- Performs a test: the installation or its component must not start!
- Places a zone demarcation if required
- Inform the permit provider of the lockouts carried out.

(Coörd.) executor(s)

- Discusses with the permit provider where the lock-outs are or were applied.
- Convinced that the correct lock has been performed and tests it before placing his padlock.

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7.2.3 After completion of the work

(Coörd.) executor(s)

- Removes his personal lock(s) and informs the provider
- Assures itself together with the provider that everything works correctly.

Permit Provider

- Designates an unlocker and gives him additional explanation about the lockouts to be removed
- Notifies the operators involved in the restart when the machine or plant is restarted.
- Assures himself together with the (coordinating) executor that everything works correctly.

Unlocker

- Removes the lockouts, labels and zone demarcation.
- Assures himself that the installation can be restarted risk-free and that the installation is working correctly.
- Places the used production locks + fittings back at the designated location

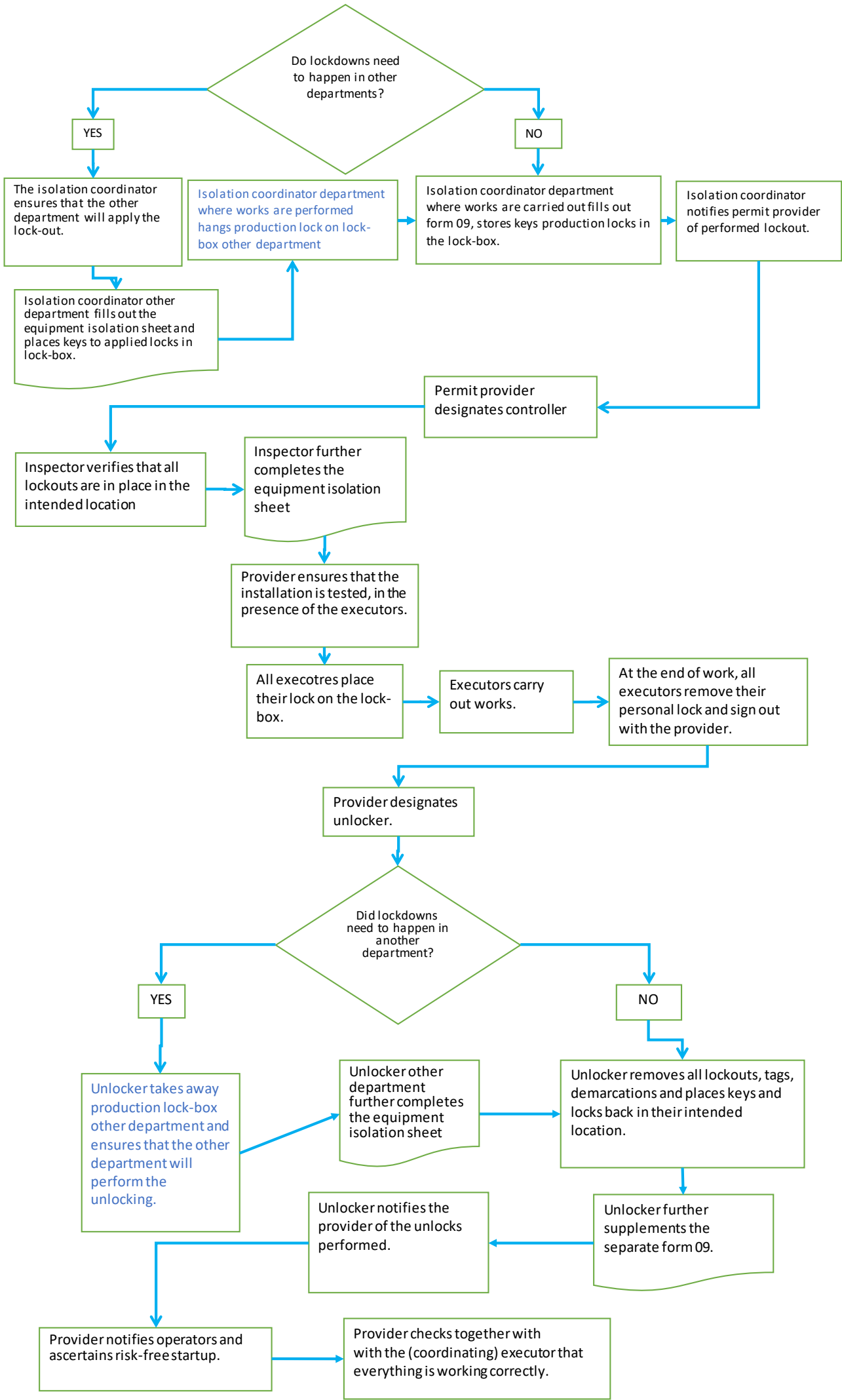
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7.3 Complex lock out
7.3.1 Flow



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7.3.2 Previous to the work

Lockout planner

- Collects the locking supplies.
- Determines whether locks should be performed in other departments.
- Fill in the isolation sheet 09:
- Verifies, as soon as the final date of the job is known, whether there have been any changes that are important. If this is the case, he will provide a new updated isolation sheet.
- In the case of cross-departmental locks, notify an isolation coördinator from the other department and clearly communicates what needs to be locked
- Communicates the final lock form to the isolation coördinator and checks whether the information is clear and understood. (tool: P&IDs)
- Instructs the isolation coordinator to perform the complex locking as soon as the final date of the work is known.

Isolation coördinator department where works are carried out (1)

- Consults with the lockout planner about the measures to be implemented (whether or not in consultation with the provider and/or coordinating executor)
- Switches off the energy sources
- Removes the residual energy present
- Applies the necessary lock-outs
- Places a label on the lock-outs, unless the locks used have a unique number traceable to the respective lock

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- Performs a test: the installation or its component must not start!
- Places a zone demarcation if required
- Places a production lock on the lockbox other department (2)
- Places the used keys of the production locks (also those of the other department) in a lockbox
- Completes the lock form:
- Informs the permit provider of the locks performed and hands him the completed lock form

Lock-up machine other department (2) (only for cross-departmental locks)

- Switches off the energy sources
- Removes the residual energy present
- Applies the necessary lock-outs
- Places a label on the lockouts
- Performs a test: the installation or its component must not start!
- Places a zone demarcation if required
- Fill in a **separate** isolation sheet:
- Inspector other department performs check and completes lock form
- Notifies isolation coördinator (1) where work is being carried out

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Permit Provider

- Checks that the isolation coördinator on the checklist has initialled each part to be locked.
- Appoints an inspector
- Is responsible for carrying out the test together with the coordinating executor(s). (the lock must be locking and the executor(s) must install their personal lock(s).)
- Insert the lock form into the lockbox and close it with a group lock. The key to the group lock is placed on the board.
- Ensures that the performers apply their personal lock to the lockbox.

Inspector:

- Checks whether all lock-outs are or have been applied.
- Initials the lock form for each checked lockout

(Coörd.) executor(s)

- Discusses with the inspector where the lock-outs are or were applied.
- Convinces that the correct lock has been made and tests it before placing his padlock. If there are several performers, each must place his personal lock on the lockbox.

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7.3.3 After completion of work

(Coordinating) executor(s)

- Removes his personal lock(s) and informs the provider
- Assures itself together with the provider that everything works correctly.

Provider

- Designates an unlocker and gives him additional explanation about the lockouts to be removed
- Assures himself together with the (coordinating) executor that everything works correctly.
- Notifies the operators involved in the restart when the machine or plant will be restarted.

Unlocker

- Removes the group lock from the lockbox and takes the keys of the production locks out of the lockbox.
- In the case of cross-departmental locks, notify an unlocker from the other department and takes the production lock of the lockbox other department.
- Completes the equipment isolation sheet.
- Removes the lockouts, labels and zone demarcation and places an initial on the lock form for each removed lockout.
- Places the used production locks + fittings back at the designated location

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Unlocker other department (only for cross-departmental locks)

- Completes the equipment isolation sheet.
- Removes the lockouts, labels and zone demarcation and places an initial on the lock form for each removed lockout.
- Assures himself that the installation can be restarted risk-free and that the installation is working correctly.
- Places the used production locks + fittings back at the designated location

7.4 Cross-day work.

If the work is not completed by the end of the day:

- Will the executors remove their personal lock
- It is not necessary that the applied production locks are removed from the equipments. The day on which work is continued, the provider / or inspector tests again together with the coordinating executor to see if the lock is secure and ensures that the executor (s) apply their personal lock (s).
- The work permit must clearly state that the installation is not ready to start and is then hung or maintained in a separate place so that the existing lock form can be reused when work resumes.
- If one or more production locks are removed, the validity of the associated work permit and lock form expires: Fill in a new work permit and lock form!
→
- If the installation cannot be started safely, assetslot (black color) must be hung. This lock may only be removed by a manager of asset.

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7.5 Temporary Removal of Locks.

It is possible that during work on an installation that is part of a complex lock you want to test or reposition.

For this, one or more locks will have to be temporarily removed.

The locking coordinator shall take the following measures:

- Inform the provider of the lock form (team leader) that they want to remove the locks
- Have all persons working on the installation in question removed. If necessary, use hazard tape or temporary barriers to demarcate a potential danger zone.
- Have all materials and tools removed.
- Have all guarantees, blockages, etc. removed.
- At the end of the test, switch off the installation again and include it again in the complex lock.

7.6 Production tasks

When performing certain production tasks, it is necessary to lock. The operator places his personal lock on an equipment to ensure that he can perform his task safely.

In the following circumstances, the full locking procedure is in force:

- Perform production task in a confined space.

7.7 Removing forgotten lock

If it is determined that an executor has forgotten to remove his personal lock and the installation must be put into service; then apply the following method: Contact the executor to remove his personal lock. If this is not possible:

1. Call the doorman: Executor may still be at the company (see badge check)
 2. Fill in an application document "removing locks"
 3. Have this document signed by the production coordinator or Superintendent and notify all executives of the department concerned. If none of these 2 people are present, to give the written approval, please contact us by telephone. If no approval (in writing or by telephone), the lock may not be removed.
 4. A telephone approval requires that the application document be signed upon return or an email sent by the production coordinator or superintendent.
- Defective installations or installations that are out of service and that are easy to put back into service must be locked and considered as a complex locking device. This will then be indicated on the lock board. Before carrying out an intervention on such installations, it must be ensured that the locking is still intact and energy-free.

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- Tag out is mandatory when it is not possible to apply a lock. Clearly state date and reason for locking.

7.8 Lock box on location (blue lock-box)

- If production decides that a lockbox should be taken outside, they also print the form "Lockbox on location" XF-452-FREC-0-00002 and fill in the necessary information.
- The form "XF-452-FREC-0-00002" is hung on the board in the control room under the appropriate section.
- Executors come to the control room to register and register in the registration book with their work permit.
- Operator who takes lockbox outside to make lock also fills in the equipment on the whiteboard at the relevant lockbox number.
- The executors then go with their work permit (which is not yet in order) and their personal lock to the place where they have to carry out their work.
- The 1st operator or team leader is the man who manages the lockbox and the work permit on site. He checks whether the lock is in order, fills in the work permit and releases the installation to start the work.
- The lockbox key will be hung on the lock board in the control room and the white work permit will be hung on the control room together with the form "Lockbox on location" XF-452-FREC-0-00002 **or** depending on the department, the work permit and lockbox key can go on location and only the form "Lockbox on location" XF-452-FREC-0-00002 will remain on the board in the control room.
- The 1st operator or team leader is responsible for hanging and unsubscribing the documents.

7.9 Sealing

- If a complex locking system is to be maintained for a longer period of time (>24 hours), it is necessary to recheck the locking systems applied every 24 hours according to the group standard.
- To achieve this goal, there is the possibility to seal the locking box.
- Procedure: the sealing tape is correctly applied to the locked lockbox. The unique number on the sealing tape must be noted on the locking form. As long as the sealing tape remains intact and corresponds with the number written on the locking form, the previously applied lock is valid.
- These sealing tapes can be obtained via the ATB catalogue Manutan article A067305 1 set is 100 pieces