

COMMISSIONING MANUAL

SAFETY PROCEDURES



ECOFLEX PROJECT COMMISSIONING SAFETY STANDARD

1. Purpose

To define controls with regard to all stages of commissioning and to ensure safe implementation and completion of the commissioning phase of the project.

2. Scope

Applicable to all EcoFlex Project related personnel including mill, project, suppliers, service providers, consultants and contractors.

3. References

- a. Mondi SD Performance Requirements
- b. Nine safety rules
- c. Relevant Mill and project specific rules and procedures

4. Definitions

Definitions, standards and systems must be clear, communicated and understood by all persons involved in the commissioning phases of the project and must include all relevant items, including the following:

a. Plant or Operating System

A system is a convenient grouping of plant and equipment that may be constructed according to a planned schedule and commissioned independently of other systems. It consists of connected individual items of equipment, or single item, which performs a unique function and includes the automation components required to operate it. Temporary loops may be required for the commissioning to be accomplished.

b. Cold Commissioning

This activity includes the transfer of responsibility from construction phase to commissioning phase of the project and can be conducted on a system-by-system or area-by-area basis. Before cold commissioning LOTO system in a reverse order (all motors have to be locked at the beginning as well as valves and blinds according to list developed). have to be applied. A list of isolating points will be developed by supplier and mutually agreed with respective Mondi commissioning manager. Isolating points will be isolated and locked by supplier's responsible persons who will confirm isolation by their signatures in the list. All keys will be put into LOTO box with the list and LOTO box will be handed over to supplier commissioning manager. Except this manual also commissioning procedure will be developed which contains:

- All works included
- Checking of affected area during wet stage
- etc

PTW is always issued in situation which requires it according to OG-42.

i. Cold Commissioning Dry Stage

The Dry Stage Commissioning includes all those activities and checks required to bring the plant on stream in a safe manner. This generally involves no-load testing. This does not include interfering into plant (therefore no PTW is required but all necessary trainings must be valid).

ii. Cold Commissioning Wet Stage

The Wet Stage Commissioning includes the use of water and is only conducted once the pipes and tanks have been cleaned and areas cleared. The area will be monitored (commissioning team will ensure visual check of the equipment and surroundings before it will be tested and during testing). Contractors who have to work in affected area will be informed through PTW and other will leave the area. In the working procedure the monitoring of effected area will be included. Risk assessment and process description (flow sheet visualisation or written description) must be done prior to this stage.

c. Hot Commissioning

This is the phase where process feed is introduced through the system / plant. All systems will be started up in operational mode, and the feed through the system will be increased incrementally until design specifications (nameplate capacity) are reached. During this phase all systems will be tested to prove their performance as per performance test procedures. On completion of this phase the plant will be formally handed over to Mondi. All persons not involved in hot commissioning have been informed to leave the area which could be endangered.

5. Safe Systems

To ensure a commissioning is conducted in a safe manner, standards, procedures and systems must be developed, communicated, understood and adhered to in full. These should include:

a. Tagging System (yellow sticker)

Shall be implemented to ensure clear communication and warning of that commissioning is in progress. Tags have to be placed on pumps, tanks, (manholes) drains and other risky areas. Yellow tags to be placed on the equipment prior start of the commissioning. The sticker shall contain the day and time of placing it on the equipment with name and signature of person who placed the sticker. Stickers or tags may be used, however must be of a design and quality to falling off or information becoming unreadable. Tagging system have to be done before the wet commissioning.

Equipment tested and all approved Zariadenie otestované a všetko preverené	
Equipment - Zariadenie	
Date - Dátum	
Test completed – Test ukončený	
Name - Meno	
Signature - Podpis	

b. Hand over for wet/hot commissioning

System must be introduced to ensure that once cold commissioning is completed the equipment is checked by the responsible persons and once all is satisfactory, a hand over documents are completed and or entry in a follow up handover register must be made and relevant marking to be made in flowsheet(s). This signifies that the equipment has been handed over for wet/hot commissioning. Hand over documents should be signed off by relevant parties and filed for reference purposes. Once this has taken place the Yellow tag is placed on the equipment to indicate hot commissioning is in progress place.

Permitting system:

Commissioning: System of check lists + safe operating procedure or PTW if necessary (e.g. in case of confined spaces, WAH,...)

For repair works: PTW and LOTO system

c. Permit to Work System

The Mondi Permit to Work System must be implemented for the commissioning phase of the project and must include the following:

- i. Training in the Permit to Work System
- ii. Appointment of Permit Issuers
- iii. Appointment of Permit acceptors
- iv. List and contact numbers of Permit Issuers
- v. Identification cards for Permit Acceptors to ensure persons accepting permits are authorised and competent

d. Pre-Task Assessments - part of PTW

The team leader / foreman is responsible to conduct a pre-task assessment with his team of their activities prior to work commencing. The copy of the pre-task assessment must be available at the work area at all times whilst to work is being conducted. The pre-task assessments must include the hazards and risks of their own activities, the effects their work will have on others and what precautionary measures are required.

e. Lock-Tag-Test

System shall be applied before cold commissioning phase start. It applies to all Mondi Štětí equipment and utilities prior they are connected. The project must implement a system which ensures all relevant energy sources are isolated prior to work commencing and that all persons are protected by his/her own personal lock.

f. HAZOP 5

HAZOP 5 assessments must be conducted on all machinery, plant and equipment using a checklist prior to the Hot commissioning phase commencing. This must be conducted by a team of experts as well as the safety engineers. During this all equipment is checked to ensure it meets the design specifications and that all safety issues have been suitable addressed, including the following:

- i. Training completed
- ii. Safe Operating Procedures available and understood
- iii. Readiness for start up (check list to be developed)

- iv. Function testing completed (follow up procedure)
- v. Cleanliness and purging completed and accepted
- vi. Confirmation of compliance with Local (Safety and environmental) Legislation
- vii. Confirmation of compliance with Mondri (safety) Requirements (according specific check list)

Only once the responsible commissioning manager has approved the HAZOP 5 checklist and that he is satisfied that all safety issues are in place may he allow hot commissioning to proceed.

g. Barricading

Suitable barricading systems must be installed at areas where commissioning is taking place to prevent unauthorised persons from entering the area or coming into contact with equipment or being exposed to risks which might exist.

h. Displaying of Warning Signs

Warning signs must be displayed on the barricading and equipment providing warning of the risks as well as prohibitions. The examples of the warning signs are at the end of this document.

Standard wording and colors of signs should be designed and issued to the managers and engineers responsible for commissioning. This will ensure that all signs are the same and understood by all. All signs should be written in at least two languages and should have a symbolic sign placed next to it.

6. Responsibilities

Relevant persons must be appointed and responsibilities clearly defined, communicated and understood. These should include the following examples:

a. Commissioning Manager shall:

- i. Ensure that this procedure and other applicable commissioning standards and procedures as well as local legislation requirements is met and adhered to;
- ii. Appoint subordinate supervisors to assist in the various commissioning phases and to ensure adherence of applicable standards, procedures and legislation;
- iii. Appoint and authorize persons as part of the commissioning team, and clearly communicating the responsibilities and systems;
- iv. Ensure all necessary tags, signs and locks required for the identification and safety of all relevant systems are available and used;
- v. Ensure early communication and warning of all intended commissioning activities (daily meetings, memos, statements);
- vi. Ensure Permit-to Work system and other systems are implemented in hot commissioning and for repair works;
- vii. Ensure Project and mill LOTO system is implemented and adhered to for all commissioning activities and includes the requirement of a one man – one lock principle.

b. Commissioning Leaders (mill side as well as suppliers) shall:

- i. Ensure all systems equipment is tagged and isolations conducted;
- ii. Ensure suitable barricading has been erected and warning signs displayed to prevent persons or vehicles entering the danger areas where commissioning is being conducted;
- iii. Coordinate the risk assessment process prior to any system being commissioned by implementing of procedures and check list for flushing and energizing and ensuring that all hazards and safety precautionary measures are clearly communicated and understood;
- iv. During commissioning period all relevant parties have to be present in coordination meeting
- v. Ensure the daily coordination meeting, shift briefings and handovers prior to or during commissioning are taking place with attendance recorded if necessary;
- vi. Approve permits-to-work for any repairs work which is required in the commissioning areas by commissioning leader;
- vii. Perform physical walk down of the system prior to commissioning each day or between breaks in the commissioning which may lead to condition changes to ensure safe to continue;
- viii. Coordinate all safety requirements with the relevant safety engineer responsible for the respective area;
- ix. Ensure all commissioning activities can be conducted in a safe manner;
- x. Ensure no commissioning activities are conducted without approval by check lists or PTW if necessary;
- xi. Maintain a data pack of all commissioning risk assessments;
- xii. Audit compliance against commissioning phase procedures.

c. Mondri Personnel

- i. Any Mondri personnel not involved in the commissioning who is required to enter the barricaded area must obtain authorization from the commissioning leader;
- ii. Any Mondri Personnel who are involved in the commissioning phase must participate in the risk assessments conducted for their specific tasks.
- iii. Adhere to any applicable standards, procedures and legislation during the commissioning of the system;
- iv. Where construction or installation deficiencies are identified, or changes are required these are to be communicated with the commissioning leader;
- v. Any Mondri personnel involved in the commissioning phase must have a clear understanding of the tagging system, barricading, signage and lock out requirements.

d. Issuers of The permit to work or approval check lists shall:

- i. Provide the required authorization for all repair works conducted in the commissioning phase.
- ii. Complete the authorization check list in full and in compliance with rules and Procedures set for this project.
- iii. Maintain a register of all authorization check lists (open and closed) for required period one year after project is realized

e. Project SHE & Legal Leader

The Project SHE & Legal Leader shall:

- i. Provide the necessary assistance with regard to safety coverage of all areas which have been handed over for commissioning;

- ii. Check that all risk assessments are recorded and communicated for all systems prior to commissioning, and provide guidance and comments as and when required;
- iii. Audit compliance against this procedure;
- iv. Conduct inspections to ensure that work is being done safely and in accordance with this procedure.
- v. Ensure daily coordination meeting is attended by safety engineer
- vi. Ensure the safety specific commissioning training is available
- vii. Ensure all safety related materials and tools are available for relevant persons
- viii. Safety coverage of all shifts during commissioning phase

7. Procedures

Procedures for each of the various stages of commissioning must be developed and clearly communicated to all relevant persons. This should include all relevant items. The following are some examples:

a. Handover from construction to commissioning

- i. The HAZOP 5 should be completed for this phase (join inspection with check list – to be developed by SHE & Legal Leader);
- ii. On completion of the construction and erection phase the relevant construction and erection personnel along with the commissioning manager / engineers must conduct a walk down of the system to ensure that the area is safe and free of hazards.
- iii. At this stage all erection phase locks either electrical and or mechanical will be removed from the system and the commissioning leader will assume responsibility for all aspects of the system, including safety.
- iv. Commissioning personnel must ensure that the commissioning locks are placed on all relevant equipment and that the Project LOTO tags are placed in the relevant MCC's and in the field identifying systems belonging to the commissioning.
- v. As far as practically possible the system must be isolated from the rest of the construction by means of barricading, but no less than clear signage indicating system is live and commissioning (wet cold and hot commissioning) is in progress.
- vi. At this stage no construction or erection personnel may enter the area unless under protection of a Permit-to-Work which is issued by the relevant responsible person of the commissioning team,
- vii. At this stage the system is ready for cold commissioning under the direction of the supplier Commissioning Leader.

b. Cold Commissioning

The Commissioning Leader(s) shall:

- i. Authorize persons to conduct the commissioning on the specific system;
- ii. Assemble a team to draft and finalize the risk assessment for the specific system. This team must include commissioning members, suppliers, contractors, Mondri personnel, safety and equipment specialists;
- iii. Ensure daily coordination meeting is conducted (with memo if necessary) with all persons involved in the commissioning;
- iv. Permit commissioning to commence once all precautionary measures are in place and all applicable standards and legislation for safety and environment is met.

- v. Attending to construction deficiencies or requirements during Cold Commissioning When it becomes necessary to request construction or erection personnel to access the area to rectify issues the following must apply:
- vi. The responsible commissioning leader must request assistance from the responsible project construction or erection manager who will then allocate the resources;
- vii. The commissioning leader shall ensure the mill PTW is being followed for repair works
- viii. LOTO procedures to be followed on all the relevant energy sources in line with project and site specific procedures;
- ix. The commissioning leader shall be responsible for ensuring that supervising the construction / erection work is in place and ensuring that the hazards and precautionary measures have been communicated to the entire team;
- x. On completion of the construction / erection work the area will be inspected by commissioning leader and declared safe and HAZOP5 conditions are fulfilled if applicable;
- xi. The commissioning leader must ensure that all personnel not involved in the commissioning phase after completion of work have left the area.

c. Hot Commissioning

- i. The same procedure applies as per the cold commissioning phase
- ii. During hot commission in case of fixing has to be done on the system normal Mondi PTW and LOTO procedure applies.
- iii. HAND OVER Protocol – G3
- iv. Where formal handover has been conducted the system changes ownership and the responsibility of safety is transferred to Mondi Operation;
- v. The project team will assume responsibility for safety where such systems are officially handed back for additional work.

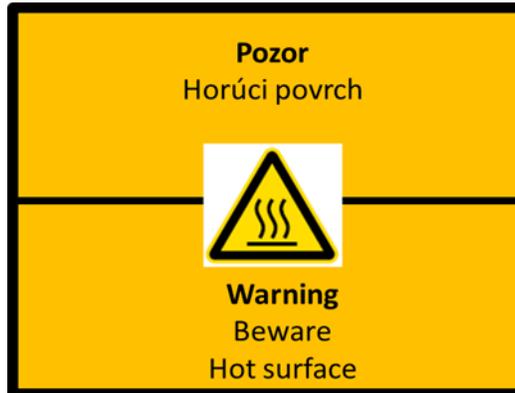
9. Stickers or Tags

To ensure that relevant information is placed on tags or stickers as mentioned in item 5 (a) above and to ensure they can have reference to the punch lists and registers, the following is proposed:

Warning tape:

Nábeh - Commissioning

Warning stickers:



Commissioning tag:

Equipment tested and all approved Zariadenie otestované a všetko preverené	
Equipment - Zariadenie	
Date - Dátum	
Test completed – Test ukončený	
Name - Meno	
Signature - Podpis	