



APPROVED
by Order dated No.

**Regulations
on Operation of Interlocks and Process Protections of the Major Equipment
of Ilim Group JSC**

2019

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**Филиал АО Группы Илим
в г. Коряжме**

**Ярлык удаления
перемычки/байпаса**

Подразделение: _____

Шаг 3. Заполните информацию ниже при удалении Ярлыка с места фактической установки перемычки/байпаса и верните оператору:

Дата удаления: _____
 Время удаления: _____

Руководитель, делающий заявку на удаление перемычки/байпаса:
 Подпись: _____

Работник, устранивший перемычку/байпас:
 Должность: _____
 Ф.И.О.: _____
 Подпись: _____

**Филиал АО Группы Илим
в г.Коряжме**

Ярлык перемычки/ байпаса

Подразделение: _____

Оператор: Разместите этот ярлык об установке перемычки/байпаса на стенде

Шаг 1. Начальник смены/дежурный инженер укажите следующую информацию во время установки перемычки/байпаса

Дата: _____ Время: _____

Оборудование: _____

Цель установки перемычки/ байпаса: _____

Место установки перемычки/ байпаса: _____

Руководитель, делающий заявку на установку перемычки/байпаса
 Подпись: _____

Согласующие лица
 Подпись: _____
 Подпись: _____

Исполнитель, которому выдается разрешение на установку перемычки/ байпаса:
 Должность: _____
 Подпись: _____

Контрольный номер: xxxx
 ----- (линия отрыва) ↓

Контрольный номер: xxxx

Шаг 2. Установщик, укажите следующую информацию во время установки перемычки/ байпаса

Дата: _____ Время: _____

Цель установки перемычки/ байпаса: _____

Место установки перемычки/ байпаса: _____

Установщик, прикрепите этот ярлык к месту фактической установки перемычки/ байпаса

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1. PURPOSE AND GENERAL PROVISIONS

1.1. Purpose of the Regulations

- 1) The Regulations establish procedures for the operation of process protection interlocks of the major equipment of subdivisions of branches of Ilim Group JSC in Koryazhma, Bratsk, and Ust-Ilimsk.
- 2) The Regulations take into account the requirements of applicable regulatory documents: Federal Law *On Industrial Safety of Hazardous Production Facilities* No. 116-FZ dated July 21, 1997, *Electrical Installations Code*, *Safety Rules in Gas Industry* PB 12-368-00, *Technical Requirements for a Subsystem of Process Protections Made on the Basis of Microprocessor Technology* RD 153-34.1-35.137-00, and are based on best practices for process safety management (PSM).

1.2. General provisions

- 1) The Regulations apply to all structural subdivisions of the Ilim Group JSC branches in Koryazhma, Bratsk, and Ust-Ilimsk (hereinafter, the “branches” or “branch”).
- 2) The branches develop a Register of Interlocks and Process Protections of Major Equipment agreed upon with the Director for Technology, Quality and Production Excellence, the HSE and Fire Safety Director and approved by the Branch Director.
- 3) No shutdown or interlock bypass can be performed without the development of measures to reduce the risk of operation of the equipment with the disabled interlock and without written (by e-mail) approval of the responsible persons determined by these Regulations.
- 4) All shutdowns, interlock and process protections bypasses shall be immediately reported to the dispatcher of the branch with specification of the time and interlock number in the Register of the branch.
- 5) In case of each shutdown, interlock bypassing prior to its disabling, measures shall be developed to reduce the risk of equipment operating with the disabled interlock which shall be agreed upon in writing (by e-mail) with the Branch Director

2. DEFINITIONS AND ABBREVIATIONS

2.1. Definitions

Safety interlock—a part of an automated process control system, a separate electrical circuit based on electrical relays, a programmable controller or other elements which ensures personnel safety and safe operation of process equipment, works in a standby mode and in the event of an emergency or pre-emergency situation, automatically transfers the protected process equipment to a safe state.

Interlock bypass—installation of jumpers, modified electrical wire connections, software changes or the use of mechanical devices that interfere with the functioning of the safety interlock system. Cases of forced air supply to the valve bypassing the controller (for example, redirection bypassing the solenoid or blocking the air supply) in order to fix the state of the valve which is a part of the safety system are also considered as interlock bypassing.

2.2. Abbreviations

FRR—federal rules and regulations

GC—Grid Code

SRB—soda recovery boiler

DCS and BMS—process control and safety systems

HO—head office of Ilim Group JSC

3. CATEGORIZATION. PROCEDURE FOR INTERLOCK BYPASS

3.1. Categorization

To ensure the safety of workers and production equipment, a hierarchy of process protections and interlocks has been developed with the following categories assigned: 1) Critical 2) Important 3) Auxiliary.

- 1) **Critical (Category 1).** Risk associated with shutting down, bypassing the interlocks and protections can lead to catastrophic consequences, is unacceptable for Ilim Group JSC (hereinafter, the Company), and the process or equipment must be shut down to solve the problem.
- 2) **Important (Category 2).** Disabling, bypassing of the interlock may be performed only with the written (electronic) approval of the Director for Technology, Quality and Production Excellence of the HO, the Branch Director, and the person responsible for the safe operation of this equipment.
- 3) **Auxiliary (Category 3).** Disabling, bypassing of interlocks is carried out with the written (electronic) approval of the Branch Director, the head of production, and the person responsible for the safe operation of the equipment.
- 4) An example of the separation of process protections and interlocks by criticality categories is given in Appendix No. 1.

3.2. Interlock bypass procedure

- 1) Safety interlocks can be brought out of operation in the following cases:
 - If equipment is in transient conditions, if the need to disable protection is determined by the operational manual for the major equipment.
 - If there is an obvious defect in protection.
 - For periodic testing, if it is carried out on operating equipment and during start-up operations (according to the approved testing schedule for process protections).
Before decommissioning safety interlocks, their categorization must be taken into account.
- 2) This practice is recognized as an interim measure and it is necessary to make every effort to restore the interlocks and protections that have been brought out of operation as soon as possible.
 - Shutdowns of interlocks and process protections shall be reviewed and approved in such a way as to ensure compliance with the safety level when continuing to operate the equipment with the interlock disabled / bypassed.
 - Any changes in the state of interlocks and process protections shall be communicated before the work commencement to the personnel servicing and operating this equipment with the interlock disabled / bypassed.
 - Additional alarms or other temporary interlocks may be installed to reduce the risk when the equipment is operated with the interlocks disabled / bypassed, in addition to changes in operating procedures / operating instructions.
- 3) All data on disabling, bypassing interlocks shall be recorded in the operational documentation, the interlock register (Appendix 3), as well as be recorded by installing identification tags on a special stand on the control panel of the shift supervisor (master), control panels for processes of workshops / productions (Appendix 2).
- 4) Terms of interlocks bypassing:
 - The common term for installing jumper / bypass (if the protection defect is obvious) of **Category 2 must not exceed one month.**
 - The common term for installing jumper / bypass of **Category 3 must not exceed three months.**

Attention: in case of defect of safety interlock of Category 1, the equipment must be brought out of operation until the defect is eliminated.

- 5) Procedure for interlock disabling, bypassing:
- The shift supervisor, the production engineer on duty shall draw up a written permit to bypass the interlock, having previously coordinated it with the responsible persons depending on the category (in writing or by e-mail) and making an entry in the interlock register and in the shutdown tag, installing the jumper / bypass (Appendix 2). In case of approval by e-mail, a printout of approval shall be attached to the interlock register. The disabling, bypassing of interlocks shall be communicated in writing or by e-mail to the Branch Industrial Safety Service.
 - Before installing an interlock bypass, the subdivision's technical specialists (with the participation of the shop manager) shall develop the following procedures: additional alarms and temporary interlocks to reduce the risk of personnel safe operation and the full functioning of equipment with installed jumpers / bypasses.
 - The person responsible for the safe operation of the equipment (shift supervisor, production engineer on duty) shall fill in the tag for the jumper / bypass installation (front side) and specify the responsible person—the employee assigned to the maintenance of this equipment.
 - The responsible person to whom a permit has been issued must make sure that the written notice contains the specification of the jumper installation (i.e. the installation location, type, number of the terminal with software, etc.) and shall fill in the back of the tag.
 - As soon as the tag is filled in correctly and completely, the person responsible for the safe operation of the equipment (shift supervisor, production engineer on duty) and the responsible person to whom the permit has been issued shall come to the equipment and carry out works on installing the jumper / bypass and placing the label. (Appendix 2)
 - The lower part of the label shall be located at the place of the actual installation of the jumper / bypass on the equipment, the upper part of the label shall be transferred to the control panel. The shift supervisor (production engineer on duty) shall place the upper part of the label on a special tablet (stand) installed on the control panel, make a record (duplicating information from the label) in the operational log and in the interlock register.
 - The boiler (turbine) operator shall make a record on the installation of a jumper in the operational log of the boiler (turbine).
 - Before operating equipment with a disabled / bypassed interlock, the shift supervisor, the production engineer on duty responsible for the safe operation of the equipment shall make sure that the instruction provides for measures to reduce the risk of equipment operating with the disabled interlock and that the operating personnel has read it, and shall inform the branch dispatcher of the start of operation of equipment with disabled interlock.
 - The branch dispatcher shall record the shutdown time in the operational information log; position, category, and number of the interlock in the branch Register.

3.3. Procedure to remove an interlock bypass

Permission to remove jumper / bypass:

- 1) After making sure that the repair works have been completed, the person responsible for the safe operation of the equipment shall issue a permit to remove the jumper / bypass.
- 2) The person responsible for the safe operation of the equipment and the performer to whom the permit has been issued shall come to the equipment and remove the jumper / bypass and the label.
- 3) The following registration entries shall be made on the jumper / bypass removal label:
 - The person responsible for the safe operation of the equipment shall record the date and time the label was removed in the interlock register.
 - The shift supervisor, the production engineer on duty shall confirm with a signature affixed in the interlock register that the jumper / bypass has been removed.

- 4) The shift supervisor, the production engineer on duty shall make an appropriate record (duplicating information from the label) on the removal of the jumper / bypass in the operational log and shall report this to the branch dispatcher.
- 5) The boiler (turbine) operator shall make a record on the removal of the jumper in the operational log of the boiler (turbine) and report this to the branch dispatcher.
- 6) The branch dispatcher shall record the interlock removal time in the operational information log; position, category, and number of the interlock in the branch Register.

4. CONTROL AND TRAINING

4.1. Control of interlock bypasses installed

- 1) The person responsible for the safe operation of the equipment shall check and monitor the labels installed on the equipment **daily** and shall make a note of checking in the interlock input / output register until the provided protections, interlocks on the equipment are restored.
- 2) The shift supervisor, the production engineer on duty shall monitor the correspondence of the label installed on the control panel stand with the records in the input / output interlocks—**on a shift basis.**
- 3) A **monthly** check of the logs of jumpers installation / removal shall be carried out by the branch industrial safety service. The report on the interlocks removal and installation with the interlock date and No. according to the Register shall be included in the service report to the HO.
- 4) A **quarterly** check of the jumper installation/removal logs at the branches shall be carried out by a commission formed in the HO of specialists of the Directorate for Technology, Quality, and Production Excellence and the HSE and Fire Safety Directorate of Ilim Group JSC. Revision of the installed / removed jumpers shall be carried out on the basis of the received reporting data from automated process control systems (DCS, BMS). The results of the check shall be recorded in the interlock input / output register. Jumpers / bypass installation shall be monitored to ensure that installed jumpers / bypasses are necessary and relevant.

4.2. Training

- 1) The workers who issue a permit, coordinate the issuance, and execute applications for interlock input/output shall be familiar with the requirements of these Regulations.
- 2) Training of the workers in the rules for operation of process protection interlocks for the major equipment established by these Regulations shall be carried out by persons responsible for the safe operation of the equipment in the form of a briefing at least every 12 months.
- 3) Familiarization of newly hired employees with the requirements of these Regulations shall be carried out during the period of familiarization (internship) with the specifics of the work.
- 4) Process personnel shall be familiarized against signature with the list of categories of protections and interlocks of the operated equipment.

Example of Protection and Interlocks Categories Register

Category 1

Safety interlocks where **bypass cannot be installed** during operation:

- Blocking of emergency protection systems
- Burner safety flame detectors
- Blocking of emergency protection systems
- The BMS processor control key must always be in the “WORK” position
- The ESP processor control key must always be in the “WORK” position
- Safety blocks of the main fuel collector
- Turbine shutoff valve shutdown device
- Shutdown devices for excessive turbine speed
- Alkali liquor refractometers (both upon one request) and valves for removing black liquor during its combustion
- Smoke exhaust indication
- Drum level indicators (simultaneously converters and water columns)
- Other interlocks capable to lead to a catastrophic failure

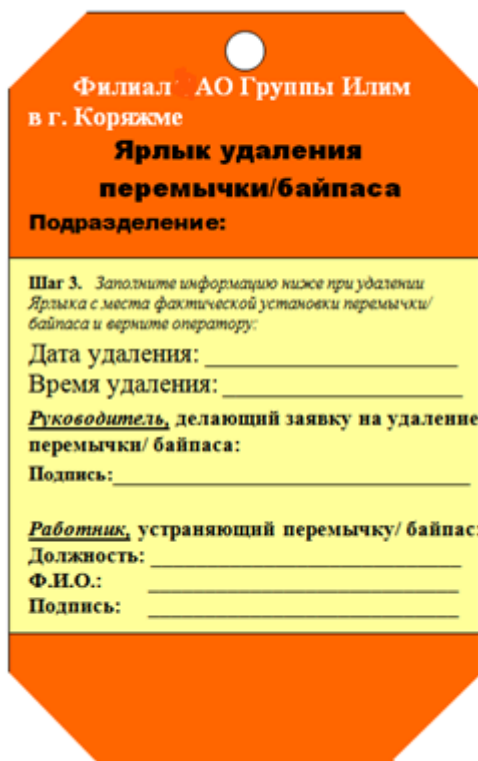
Category 2

- Automatic process interlocks
- Interlocks of system ensuring sustainable
- High / low pressure in the furnace
- Loss of signal from the last exhauster
- Loss of supply fan
- Minimum air consumption
- High/low pressure in the burner/igniter collector.
- Confirmed purge interlocks
- Withdrawable burner/igniter not in ignition position
- Minimum steam consumption < 30% of maximum continuous rating
- Minimum alkali liquor consumption < 30% of maximum continuous rating
- Liquor gun position wrench system
- Relay protection of electric lines (for short periods of regular calibration and testing, written procedures are not required)
- Shut off by oil pressure of the turbine lubrication system
- Vacuum shutdown of the turbine

Category 3

Interlocks that are less critical and, generally, have no safety consequences, but are used to protect equipment.

Label of installation/removal of jumper / bypass



**Филиал АО Группы Илим
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**Ярлык удаления
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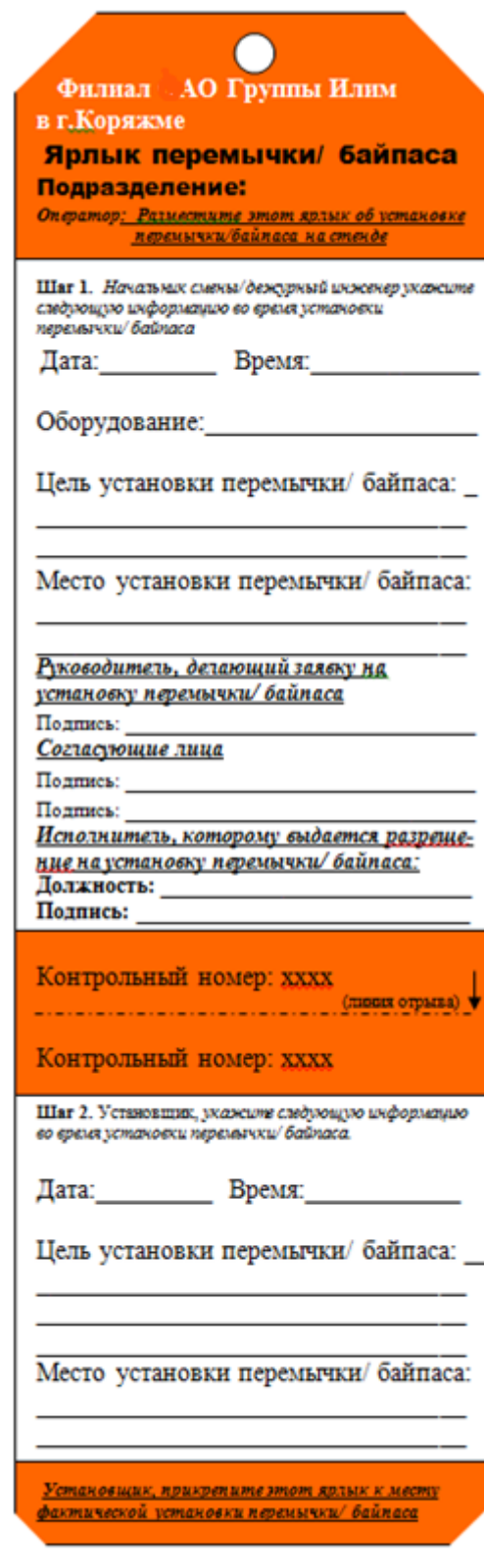
Подразделение:

Шаг 3. Заполните информацию ниже при удалении Ярлыка с места фактической установки перемычки/байпаса и верните оператору:

Дата удаления: _____
 Время удаления: _____

Руководитель, делающий заявку на удаление перемычки/байпаса:
 Подпись: _____

Работник, устраняющий перемычку/байпас:
 Должность: _____
 Ф.И.О.: _____
 Подпись: _____



**Филиал АО Группы Илим
в г. Коряжме**

Ярлык перемычки/ байпаса

Подразделение:

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Оборудование: _____

Цель установки перемычки/ байпаса: _____

Место установки перемычки/ байпаса: _____

Руководитель, делающий заявку на установку перемычки/ байпаса
 Подпись: _____

Согласующие лица
 Подпись: _____
 Подпись: _____

Исполнитель, которому выдается разрешение на установку перемычки/ байпаса:
 Должность: _____
 Подпись: _____

Контрольный номер: xxxx
(линия отрыва) ↓

Контрольный номер: xxxx

Шаг 2. Установщик, укажите следующую информацию во время установки перемычки/ байпаса

Дата: _____ Время: _____

Цель установки перемычки/ байпаса: _____

Место установки перемычки/ байпаса: _____

Установщик, прикрепите этот ярлык к месту фактической установки перемычки/ байпаса

	Branch of Ilim Group JSC in Koryazhma
	Label of removal of jumper / bypass
	Unit:

	Step 3 Fill in the information below when removing the Label from the place of the actual installation of the bypass jumper and return it to the operator
	Removal date:
	Removal time:
	Supervisor making a request to remove the jumper / bypass:
	Signature:
	Worker removing jumper / bypass:
	Title:
	Full Name
	<u>Operator: Place this label on installation of a jumper / bypass on the stand</u>
	Step 1. Shift supervisor / engineer on duty: specify the following information during installation of the jumper / bypass
	Date: Time:
	Equipment:
	Bypass jumper installation purpose:
	Location of the bypass jumper installation:
	Supervisor making a request to install the jumper / bypass:
	Approvers
	Executor to whom the permit is issued to install a jumper/bypass:
	Control number: xxxx
	(separation line)
	Step 2. Installer: specify the following information during installation of the jumper / bypass
	Date:
	Time:
	Bypass jumper installation purpose:
	Location of the bypass jumper installation:
	Installer, attach this label to the actual place of installation of the jumper/bypass

APPENDIX 3

Interlock and protection input/output register

I t e m N o .	Dispatcher name of the equipment	Date of jumper in- stallation	Name of the equipment in- terlock Control num- ber of the jumper label	Full name, position, and signature of the person re- sponsible for the jumper in- stallation	Full name, po- sition, and sig- nature of the person who in- stalled the jumper	Jumper re- moval date	Full name, po- sition, and sig- nature of the ap- plicant responsi- ble for the jumper removal	Full name, po- sition, and sig- nature of the executor who removed the jumper	Date of the log review and re- marks on the remaining jumpers