SAFETY JOBS IN PREHEATERS

APPENDIX 1 : High pressure water jet lances

High pressure water jet lances are mainly used to destroy hot material clogging and clinker accumulations. Such jobs are located in the preheater tower, at the Lepol grate, at kiln entrance and exit and in the clinker cooler.

The water pressure can reach up to 1000 bars and can cut a human body in two parts. That's why this tool must be handled with extreme care.

Anyone able to use it or to be located nearby high pressure water jet lances must:
- Know what are the risks
- Strictly apply safety procedures and recommendations
- Take care to your and your colleagues’ safety

1- Hazards

Perforation or cutting of the body caused by the water jet
If the lance is not put in the proper direction, or if the lance user loses control, the water jet can reach the operative, team members or a nearby person. The water jet force can be compared to a gun bullet.

Violent hurts
When the pump is switched on, the water coming with high speed can surprise the operative. He can be hurt by the motion of a hose, or can fall down on the floor. Falls are worse if the floor is slippery or cluttered up.
Same process for shut off. The water control operator must not suddenly shut off the water flow without notifying the lance operator first. In this case the sudden drop in pressure will put the lance operator off balance and a fall towards the hot opening may occur.
Burns
- Burns due to hot gases.
- Burns due to hot material projections (burns on hands, face, eyes, feet).
- Burns due to the kiln flame if the operation takes place near the kiln burner.

Breaks of hoses or connections
People can be hurt by water coming out with high pressure.
In addition, in case of break of connection, people can be injured by the hose due to its uncontrolled motion.

2- Safety recommendations

General
- All lances must be made in a way that they require a permanent and voluntary action from the operative.
- The high pressure pump must be locked at all times when not used.
- There must be devices that disable to have a higher pressure than the maximum established by the pump manufacturer.
- Each pipe must be equipped with a valve that can be locked-out. Moreover, each one of these valves must be locked when not in use.
- Each connection must be secured with a whip-check.

Training
Each user must have been trained and namely authorized to use the pump and the lance.
Never let these tools to a non-trained person, even for a short time.
Check the shape of the tools
- Track any leakage from the lance or hoses.

- Check that the trigger is in proper shape and can move easily.
- Never block the trigger (with a rope for example).
- Check that hoses and connections are in good shape and that they can work with the pressure delivered by the pump.
- Protect hoses from sharp edges (use tubes as protections, or avoid contact with sharp edges).

- Don’t modify nor neutralize pressure limitation devices.

- Tighten connections with appropriate wrenches.
• Report any damage or malfunction you detect.

Signal your working area
• So that the access is forbidden to anyone not involved in this particular job. Use tags, chains, fences.
• Put out any material, part or rubbish that can be hazardous.
• Clean the floor.

Wear your PPE
• Use the specific PPE defined for this job.
• Report any wear or malfunction of your PPE.

Work in a team
Never use the high pressure pump or the lance alone.
This job requires:
• One lancing performer
• One person acting as coordinator, ready to stop the pump in case of emergency, ready to help the lancing performed if needed. This person must be in contact with the CCR at all times, and must keep the lancing performer in direct sight.
• One person checking the pump at all times in case there is no emergency switch.
Follow with high care how operations are ongoing

- Inform about the beginning of the job (siren, visual alarm, inform the CCR).
- Switch on the pump. Increase the water pressure after the lance is inserted inside the place to clean.
- Activate the trigger once the lance is in front of the material to unplug.
- Decrease the water pressure as soon as the operation is finished.
- During the operation, an operative must be ready to stop the pressure in emergency if needed.
- Inform about the end of the job.