TECHNICAL NEWS

CORTEM® GROUP
To be sure to be safe.

August 2019

August is the month of maintenance operations

1. Introduction

August is usually the month of scheduled maintenance. During this month, the plants are shut down in order to check the efficiency and safety of machinery and equipment.

A regular maintenance is essential to maintain equipment, machineries and work environment safe and reliable. The lack of maintenance or improper maintenance operations can cause extremely dangerous situations, accidents and health problems. Maintenance itself, however, is a high-risk activity because some of the dangers arising from the nature of work. It runs in all sectors and in all workplaces. Consequently, maintenance workers may be exposed to various dangers more than other employees.

According to the European standard EN 13306:2018, maintenance is the *"combination of all technical, administrative and management actions carried out during the life cycle of an item in order to preserve it or bring it in a state in which it can complete its function".*

In hazardous areas plants with presence of potentially explosive atmosphere, the reference standard for maintenance is the CEI EN 60079-17, latest edition of 2015. This standard is intended for users and covers aspects directly connected with the verification and maintenance of electrical systems located in dangerous locations only, where the danger may consist of flammable gases, vapors, mists, dust, fibers or volatile spinning residues.

It does not include:

- the other fundamental requirements for the installation and verification of electrical systems;
- checks on electrical equipment;
- repair and restoration of equipment protected from the explosion.

Mining, areas with hybrid mixtures (dust and explosives dust), pyrophoric substances are excluded from the application of the standard.

Maintenance is a combination of operations that are necessary to maintain plant 's features and plant's components so that every single part is always able to work safely.

In our case, the efficiency of electrical equipment must be assured against the danger of explosion.

Proper actions for a good maintenance are:

- Reparation: an action to re-establish the efficiency of a damaged component.
- Review: the control and the reinstate of a component that has been in service for a certain period of time but that is not necessarily out of order.
- Reconstruction: a repair method that involves the replacement, removal or addition of material to bring a component back to the efficiency required by its construction specifications.
- Change: it's the variation in a component's project, authorized by the constructor and, if necessary, by the certification authority.

The original features of an electrical equipment must be assured through a specific maintenance program that takes into account the type of electrical construction, the service required and the environmental conditions in which it operates.

Another important element to consider for a maintenance program is the personnel training, whose training has included instructions on the various protection modes, on the methods of installation, on the prescriptions of the aforementioned standard, on the national laws and relevant company standards of the plant and on the general principles of the dangerous places classification.

2. Five basic rules for a safe maintenance

1. Planning
2. Safety of work area
3. Use of appropriate equipment
4. Work performed according to planning
5. Final Inspection

Planning

It's essential to start with a proper planning.

At first, it's necessary to prepare a risk assessment involving workers in this process identifying potential hazards and issuing measures to eliminate or minimize the risks.

Must be established also:

- a safe work system;
- the time and the resources that the activity will require;

- a method of communication between the maintenance staff, the production personnel and all other parties involved.
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Furthermore, it's necessary to ensure that workers:

- have the skills necessary to perform the required tasks;
- are informed about safe work practices;
- know what to do if a situation beyond their competence.

Finally, it's important to establish the chain of command.

Consult employees and keep them informed is essential throughout the planning phase. Maintenance workers must not only be informed of the results of the initial risk assessment but must also participate in it.

Because of their familiarity with the workplace, they are often best placed to identify risks and the most effective ways to face them. Employee participation in the planning process not only increases the safety of maintenance work, but also its quality.

Safety of work area

The work area must be safe, avoiding unauthorized access.

It must be clean and safe with the power supply blocked, the moving parts of machinery must be insured, the temporary ventilation installed, and the safety routes must be fixed so that workers can enter and leave from work area in safe conditions.

It must be well-marked.

If machines protections should be removed or disabled, the procedures for locking must be followed. Maintenance workers and workers must be trained on how and under what conditions the protections can be removed.

Use of appropriate equipment

Workers, who perform maintenance operations, must have the appropriate tools and equipment, which may differ from the ones normally used.

As they can work in areas not designated for the human presence and may be exposed to various dangers, they must also be equipped with suitable individual protective equipment.

Even if the plant is inactive, the staff will always be equipped with explosimeter to ensure the possible presence of dangerous atmosphere.

All the individual protective equipment must be tailored to the identified risks, without increasing any other risk.

Work performed according to planning

Workers and supervisors must be familiar with the defined working procedures which must be properly understood and correctly applied.

The work must be monitored in order to respect the agreed safety of work systems and the facilities standards.

Often maintenance is performed under pressure, when for example a failure caused the stop of production. It's necessary

to follow safe practices, even under pressure: any shortcuts may be very dangerous causing accidents, injuries or damage.

Furthermore, it's necessary to have procedures for unexpected events. Part of the safety of the work system must be the stop of working process when you are facing with an unexpected problem or a problem that goes beyond your skills. It's very important to remember that, go beyond the limits of own competences, can also cause serious accidents.

Final Inspection

Maintenance process must finish with the necessary inspections in order to guarantee that:

- the task has been completed;
- the plant is in safe condition;
- all the waste material generated during the maintenance process has been removed.

Once everything has been checked and declared safe, it's possible to close the task and inform the supervisors and the other workers.

The final phase includes the preparation of a report describing the work performed, adding comments on the difficulties encountered and recommendations for further improvements. Ideally, it also should include a discussion during a staff meeting where the workers involved in the process can express their views on the work of maintenance and appropriate suggestions for its improvement.

For any indication and detailed information refer to the CEI EN 60079-17: 2015 standard (CEI 31-34: 2015) "Explosive atmospheres - Part 17: Verification and maintenance of electrical systems"