



Maintenance in Hazardous Areas

Christmas is coming but not everyone can enjoy the long-awaited vacation.

Plants, in fact, are often stopped to perform those maintenance activities that are fundamental for the continued plant safety.

The maintenance of an explosion proof plant is a very important step as well as his correct project and construction.

Nothing in the world remains unaltered over time, therefore, when some characteristics change and may affect the safety, it is necessary to provide some procedures to preserve, as much as possible, the product to its initial safety condition.

Unfortunately, a lot of incidents in petrochemical industry, due to electrical causes, are attributed not to mistakes in planning or in choosing a method of protection, rather to a missing or incorrect maintenance.

We can be sure of the safety in a plant just build but we can't be sure anymore after a few years of operation. A periodic check is therefore essential and it must follow a proper maintenance of existing equipment and a suitable replacement of those which are no longer completely reliable.

Standards

In relation to controls and maintenance of electrical plants, in places with explosive atmosphere we refer to CEI EN 60079-17 standard that gives operative criteria that must be followed to check this kind of plants.

Maintenance

Maintenance refers to those 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 to maintain an electrical plant are as follow:

Repairation, an action done to re-established the efficiency of a damaged component.

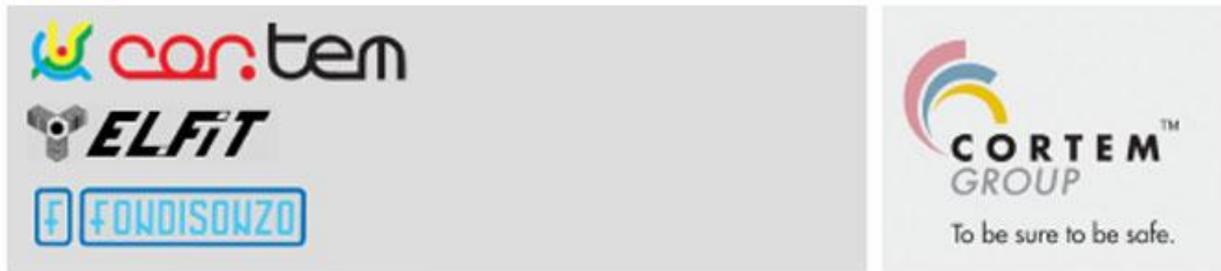
Review, to control and reinstate a component that has been in service for a certain period of time but that is not necessarily broken.

Reconstruction, involve substitution, removal or addition of materials to reinstate a component to its previous efficiency, expected by his constructive specifics.

Change, variation in a component's project, authorized by the constructor and, if necessary, by the certification authority.

The original features of an electrical plant 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 they operate.

Another important element to consider for a maintenance program is the personnel training.



Personnel training.

All the personnel in charge to maintenance operations of an explosion-proof electrical equipment need a training that enables them to familiarize with an explosion-proof equipment.

In particular, human resources' know-how should comprehend: technical skills (electrical and mechanical) and direct knowledge of chemist and petrochemical productive process and dangers that derivate to this.

In particular, the personnel training must focus on the following activities:

- Familiarizing with the standards regulating the identification and classification of hazardous areas;
- Familiarizing with the standards regulating the protection methods of electrical equipment installed in the plant;
- Familiarizing with the applied protection methods;
- Familiarizing with the particular project stages as far as protection methods concern;
- Recognizing the protection methods by their symbols;
- Identifying the components and spare parts used by the manufacturer;
- Familiarizing with the electrical and mechanical technologies to repair;
- Familiarizing with the tests procedures to repair electrical equipment.

The tasks for the trained staff shall be:

- To repair, recover and restore any electrical equipment to its working parameters;
- To perform the prescribed tests on any repaired equipment;
- To report to their managers the repaired damages, with the repair procedure performed;
- To list any replaced or rebuilt parts;
- To record the results of any verification and test;
- To mark any electrical equipment with the proper maintenance symbol.

The training of the staff must be continuously maintained, updated and renewed. Training in an important field like maintenance, shall be properly recorded and archived, to continuously monitor the exact level of preparation of the staff.

Conclusions

The maintenance of an explosion-proof electrical equipment is a so complex and wide topic that a full text would be necessary to treat it in an exhaustive way.

Standard CEI EN 60079 – 17 contains some particular prescriptions of maintenance that we have not examined in this article, so for a thorough analysis we recommend the readers to directly look up the original regulation.

The purpose of this article is to highlight the importance of monitoring and maintenance a plant to ensure its safety over time.