



Implementing an Electrical Safety Program in Middle East Industries

dss⁺

Protect. Transform. Sustain.



Implementing an Electrical Safety Program in Middle East Industries

Electrical risks are not sufficiently understood, assessed and mitigated

The Middle East region has experienced rapid growth in the last decades across numerous industries to diversify the region's economic activity. Regional construction activity has increased, demand for materials such as aluminum, steel and cement are highly sought after, and due to the abundant oil and gas reserves, the Gulf Cooperation Council (GCC) states are also producing a variety of chemicals and plastics products.

In this context, the demand for power across industries have increased resulting in complex power generation plants and high and low voltage systems and networks being built to supply energy intensive industries such as aluminum smelting, steel manufacturing, oil refineries, etc. posing inherent electrical risks to be carefully managed. Organizations have adopted different international electrical safety standards causing inconsistency and fragmented electrical rules being practiced, often without an adequate overarching electrical safety program (ESP) to effectively address electrical risks. Furthermore, the industrial development in the Middle East region has also attracted a diversified workforce, which holds various perceptions about electrical risks, skills, work practices and rules, all of which can have the unintended consequence of creating unsafe working environments.

According to Electrical Safety Foundation International, electricity can be a leading cause of fatalities or serious injuries at work. There was a 35% increase in electrical injuries between 2016 and 2017 and contact with, or exposure to, electricity was the sixth most common cause of workplace fatality in the US.



A key success factor to sustaining an ESP is obtaining continued senior management support of the program and its improvement initiatives.

As an international organization, our experience indicates that challenges regarding electrical safety, while nuanced, are not unique to a specific region.

dss+ role is to work with companies which may be exposed to operational risks from both high and low voltage electrical systems – by combining global insights with local expertise.

dss+ focus is to raise the level of awareness to electrical risks and drive sustainable risk reduction through fit-for-purpose electrical safety programs integrated into broader operations and asset management. Unless electrical risks are fully understood, assessed, and effectively mitigated, the likelihood of serious incidents, injuries and even fatalities, remains high.

A step towards improved Electrical Regulatory Requirements for the GCC region

The United Arab Emirates (UAE) has taken steps towards improving electrical safety by developing a set of standardized regulations through the creation of the Abu Dhabi Occupational Safety and Health Center, an Abu Dhabi Emirate governmental body in 2010. The body developed an integrated Occupational Safety and Health (OSHA) system to protect the workers and to spread the OSH culture within the Emirate.

Included in the OSH system are codes of practice related to electrical safety, lock out-tag out and technical guidelines related to OSH incident notification, investigation, and reporting. This is a promising first step towards better reporting mechanisms for hazardous industries which will progressively contribute to raising the level of standards and practices to mitigate specific risks.

However, to create a sustainable change in electrical safety for the region and keep pace with rapid industrial expansion, industrial companies need to think beyond checklists of best practice and operating procedures and adopt a riskbased and holistic approach.

Establishing a sound Electrical Safety Program to address electrical risks

dss+ recently worked with an organization to enhance its electrical safety management systems, practices and related mindsets and behaviors to mitigate its electrical risk profile and support continuous improvement.

The partnership with dss+ started following some electrical related incidents and injuries that involved non-electrical personnel at the company.

"Industries need to think beyond checklists of best practice and operating procedure"

Together with dss+, the facilities developed a comprehensive tailored approach to close a multitude of identified gaps in electrical safety systems and practices such lack of standardized rules and requirements, inadequate Personal Protective Equipment and tools, absence of some energy isolation equipment, and lack of testing and inspection programs for RCDs (Residual Current Devices) to name a few.

The Electrical Safety Program aimed to address three main areas, focusing on:

1. Establishing Electrical Safety Governance

Implementing a clear electrical safety governance structure tasked to standardize electrical safety practices across all work groups, areas and sites, and in particular to:

- Establish an overarching Electrical Safety Code of Practice providing a set of clear requirements across all elements of an ESP [graphic 1].
- Ensure effective communication flow to facilitate a collaborative
- work experience among teams across their large and complex facility and promote sharing of best practices.

2. Reducing Primary Electrical Risks and Strengthening Key Systems

Developing and adopting specific risk reduction measures to mitigate both arc flash and shock hazards across a wide range of electrical equipment and systems as well as strengthening and standardizing key electrical safety procedures for high-risk tasks.

3. Building the capabilities

Raising level of awareness on electrical hazards associated to both high voltage and low voltage systems and training all electrical practitioners on the new requirements of Safe Electrical Work Practices to ensure a clear and consistent understanding.

A key success factor to sustaining an ESP is obtaining continued senior management support of the program and its improvement initiatives. For this reason, having a member of the senior leadership team sponsoring the program demonstrates necessary commitment and resources for risk reduction.



- Establish permanent electrical safety teams to address systemic challenges and drive continuous improvement
- Set KPIs and processes for continuous improvement
- Conduct periodic 1st and 2nd party audit of electrical safety practices with focus on implementation effectiveness
- Ensure senior leadership oversight of risks and program effectiveness

- ARC flash risk assessment and protection
- Shock risk assessment and protection
- Use of correct PPE and tools
- Incorporate best practices in key systems and procedures

- Thorough qualification process for HV and LV authorized personnel
- Awareness and Training of electrical practitioners and affected personnel
- Effective two-ways communications to raise risk awareness

The integrated, overarching Electrical Safety program resulted in tangible electrical risk reduction as well as provided the foundations for continuous improvement:

1. Increased awareness of the electrical hazards and risks

Across the organization, employees began to have clear understanding of the electrical hazards associated to high and low voltage systems and tasks. Increased risk awareness also triggered a change in behaviors with a higher level of operational discipline during execution of electrical tasks. This has enabled them to implement a sustainable risk mitigation process to continuously build an electrical safety culture.

2. Strengthened electrical safe practices

The Electrical Safety Code of Practice provided standardized requirements across all areas, being implemented during planning and execution of jobs to mitigate electrical risks and perform safe operations.

3. Strengthened Electrical Safe Practices

Planning and execution of the job became key requirements to perform safe electrical tasks. The rules defined, revised and developed as part of the Electrical Safety Code of Practice started to be applied and implemented in the day-to-day activities.

4. Established Continuous improvement

The permanent multi-disciplinary electrical safety team provided a companywide view of systemic challenges and constituted an effective platform to foster continuous improvement through electrical safety KPI monitoring, planning of improvement initiatives, periodic audits and sharing of from near misses and incidents.



Closing remarks

Electrical risks are among the top operational risks in energy-intensive industries characterized by extensive high and low voltage equipment and systems. Our experience in the GCC region and fast growing economies suggests that electrical risks are still not fully understood nor effectively mitigated and are a cause of operational incidents and serious injuries or even fatalities. A risk-based and comprehensive electrical safety program as discussed above provide a sound foundation for electrical risk reduction and sustained improvements.



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