Swaziland electricity safety

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This study’s main objective was to identify the hazards associated with each step involved in the generation, transmission and distribution of electricity at SEC and to generate controls to ensure that risks are eliminated or reduced to tolerable level. The hazard identification and risk assessment tool were developed from clause 4.3.1 of OSHAS 18001 to improve safety at Swaziland Electricity Company.

Section 2 of the paper presents the definition of hazard identification and risk assessment with reference to some concepts from literature. The proposed simplified tool is then presented in section 3. Section 4 concludes the findings of the study.

Hazard identification and risk assessment: The hazards are defined as potential or harm or all aspects of technology and activity that produces risks [5]. Whilst risk assessment is about deciding who might be harmed and then judging how likely it is something goes wrong, and how serious the consequences could be and how to reduce it to as low a level as possible [6]. The Health and Safety Executive [7], Kaplan and Garrick [8]; Gillett defines risk assessment as a process that determines the degree of risks that employees face from exposure to health and safety hazard arising from a given activity, facility or system at work and to establish controls requiring prioritization.

In this paper risk assessment refers to the process that identifies the hazards associated with particular activities/tasks on electricity sites, evaluates the effects and estimate hazard or aspects of exposure to these hazards. These are then prioritized, controlled and reviewed continuously. The outcome of this process is to dictate what applicable and suitable monitoring and measurement, training operational control, objectives and targets as well as related safety programmes must be put in place by the organization [9].

The data obtained using the questioners and focus groups meetings was subjected to quantitative analysis. Variables such as employee’s skills, educational background, age, work experience exposure to environmental health and safety training, were used to determine the environmental risks associated with the transmission, distribution and generation of electricity.

General framework of risk assessment: Risk assessment is a stepwise process consisting of interrelated but distinct phases. Thus the context must be established first before the hazard is identified. The same is true for estimation of the risk stage, in that it cannot start until finishing identification of the hazard stage. Five stages of risk assessment have been identified, which are establishing the context, identifying the risk, estimating the risk, evaluating the risk and controlling/responding to the risk. This has been adopted from a framework by Australia New Zealand risk standard 2004 as shown in Figure 1.

Figure 1: Shows hazard identification adopted from Australia New Zealand risk standard (2004).

Figure 2: Hazard identification process and risk assessment process which has been used in this study.

The steps in the following sections highlight the tool that was used for hazard identification and risk assessment at Swaziland Electricity Company, the case for the study.

Data collection was based on the following, experienced employees who were well versed of their daily activities and associated risks and control and a competent team to do the hazard identification. According to clause 4.3.1 there are various methods of hazard identification including, job safety analysis (JSA), Hazard and operability Analysis (HAZOP) and what if method. The business unit’s teams from (generation, transmission and distribution) assembled and conducted the Hazard identification and Risk Assessment (HIRA) following the process using the chart in Figure 3.

Figure 3: Hazard identification and risk assessment process.