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Development of a Disaster Action Plan for Hospitals in Malaysia Pertaining to Critical Engineering Infrastructure Risk Analysis

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ABSTRACT

Critical engineering infrastructure (CEI) risk analysis is one of the tools used to measure potential risks in order to develop a disaster action plan (DAP). For hospitals, electricity and water supplies are two of the critical engineering infrastructures and when affected can become threats themselves. The objectives of this study are: i) to identify and analyse threats to water and electricity supplies, the threats being of high tendency to be realised during floods and socio-technical disasters; and ii) to review existing disaster action plans and subsequently develop a comprehensive one for water and electricity supplies and to be referred together with existing hospital DAPs. The HIRARC (Hazard Identification, Risk Assessment and Risk Control) guidelines provided by DOSH (Department of Occupation Safety and Health, Malaysia) were employed in the risk analysis process. This process was conducted through questionnaire surveys at several hospitals around Kota Bharu, Kuala Krai, Kajang, Serdang and Klang which have been hit by floods before. The survey involved 400 hospital and their concession company employees through interviews, meetings and workshop sessions. The development of the action plan followed the UNISDR guidance note on Emergency and Disaster Preparedness for Health Facilities and fulfilled the four phases of disaster management; mitigation, preparedness, response and recovery. Results of the analysis revealed that threats faced by the hospitals fall into four major categories; (i) submergence (ii) technical failure (iii) unpreparedness and (iv) unexpected events. The study also revealed that while the threats faced by Kota Bharu and Kuala Krai hospitals were of high risk those faced by Kajang, Serdang and Klang hospitals were mostly medium or low. Therefore, it is concluded that a comprehensive DAP based on the set objectives of ensuring continuous water and electricity supply and the enhancement of coordination among state health departments, hospital managements, concession companies and utility providers must be developed.

Keywords: Critical engineering infrastructure, risk analysis, disaster action plan

1. Introduction

According to the Malaysian National Security Council (MNSC) Directive No. 20, a disaster can be defined as an incident that occurs unexpectedly, complex in nature, resulting in the loss of lives and damage to properties and the environment as well as interfering in the daily activities of the local community. During a disaster event, hospitals are expected to operate efficiently and continuously in order to provide medical treatment to injured patients. However, medical care for injured patients can be affected if hospitals face insufficient support of critical engineering infrastructures (CEI) such as electricity, water supply, medical gas and access to road transportation networks. These CEI are important for the functional continuity of the health facilities.

Their importance was clearly seen during the Hurricane Katrina disaster of August 2005, in Louisiana, USA, when health facilities stopped functioning due to non-operating generators and the impossibility of providing supplies through the flooded road network. About 24 hospitals were affected where patients had to be evacuated because of the loss of power, water, and sewage services. Many of these hospitals required external assistance, but it was slow to arrive (Gray & Hebert, 2007). Some hospitals evacuated all patients successfully, but by the end of that long week, some had become places of death. Another statistic was in 2008, when a massive earthquake struck China's Sichuan province, leaving 11,000 hospitals damaged or destroyed (WHO, 2009). This extensive damage greatly affected the health care services. Similarly for the recent Kelantan flood of 2014, while many hospitals were engulfed in water, those that were not or only partially affected were also not fully functional due to breakdowns in their CEI, especially the supply of water and electricity.

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