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THE INSTITUTION OF ENGINEERS, MALAYSIA

Bangunan Ingenieur, Lots 60 & 62, Jalan 52/4, P.O.Box 223, (Jalan Sultan),

46720 Petaling Jaya, Selangor Darul Ehsan.

Tel: 603-7968 4001/4002 Fax: 603-7957 7678

E-mail: sec@iem.org.my Homepage: http://www.MylIEM.org.my

**Risk Management in Engineering**

by Ir. Ahmad Rasdan bin Ismail

RISK is defined as the probability of obstacles that may lead to the failure of a project. While risk cannot be eliminated from projects, it can be reduced by risk management. Robert Charette pointed out that "risk management does not deal with future decisions, but the future of present decisions", while Smith (2010) stated that "risk management is a systematic application of management policies, procedures and practices for the task of identifying, analysing, evaluating, responding and monitoring risk".

The common risks that always occur in engineering projects are in the form of finance, materials and manpower resources, hazards related to the safety of human beings and the scheduling of project completion. As engineers, it is compulsory to be concerned about any possible risks that may occur during the project period. Therefore, it is a significant concern to most engineers that their engineering projects be completed within the estimated cost and duration without any fatality. Safety issues have become a major concern in engineering projects. The Department of Occupational Safety and Health (DOSH) is a government body that monitors every work sector on issues related to occupational safety and health at the workplace.

The risk management process begins by identifying the risks before the start of any work or project. Identifying the risks in the early stages will help reduce losses and prepare us to face the consequences of the problems. Inspect the workplace and identify the possible hazards before analysing the risks. Then, evaluate each risk and classify the level of the risk accordingly. The risk response planning addresses the various ways to deal with the identified risk such as transferring the risk, prepare to avoid or reduce the risk, as well as prepare a contingency plan. Finally, implement the developed management plan to continuously monitor the risks and prepare the documentation of the risk management plan.

Risk management principles always start with creating a risk management plan. Assigning a risk engineer who is responsible for forecasting potential project problems is a good solution. The budget and schedule should include a calculated risk reserve to avoid over cost overruns and delay in project completion. After implementing the risk management plan, the risks must be continuously monitored. Furthermore, all parties need to establish an efficient communication channel at the workplace by adhering to specific procedures and comprehensive documentation.

In conclusion, brainstorming is the most common risk identification method using the SWOT (Strength, Weakness, Opportunity and Threat) analysis. It is also important to develop a Risk Management Plan that meets the requirements for Continuous Risk Management (CRM) processes and to monitor the risks frequently. Providing proper training and organising risk management workshops would help increase risk management awareness among staff members or workers. Besides implementing safe work practices by providing Personal Protective Equipment (PPE) to workers, safety rules and regulations must be enforced at the workplace. Risk management can help to avoid or lessen the impact of issues that threaten the success of a project. Last but not least, as engineers, we need to develop a sensitivity to expect unexpected events in order to be well prepared to deal with any eventuality. ■