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Identification of Risks Associated with Process Automation Systems

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Abstract : A need exists to identify the sources of risks associated with the process automation systems within petrochemical companies or similar energy related industries. These companies use many different process automation technologies in its value chain. A crucial part of the process automation system is the information technology component featuring in the supervisory control layer. The ever-changing technology within the process automation layers and the rate at which it advances pose a risk to safe and predictable automation system performance. The age of the automation equipment also provides challenges to the operations and maintenance managers of the plant due to obsolescence and unavailability of spare parts. The main objective of this research was to determine the risk sources associated with the equipment that is part of the process automation systems. A secondary objective was to establish whether technology managers and technicians were aware of the risks and share the same viewpoint on the importance of the risks associated with automation systems. A conceptual model for risk sources of automation systems was formulated from models and frameworks in literature. This model comprised six categories of risk which forms the basis for identifying specific risks. This model was used to develop a questionnaire that was sent to 172 instrument technicians and technology managers in the company to obtain primary data. 75 completed and useful responses were received. These responses were analyzed statistically to determine the highest risk sources and to determine whether there was difference in opinion between technology managers and technicians. The most important risks that were revealed in this study are: 1) the lack of skilled technicians, 2) integration capability of third-party system software, 3) reliability of the process automation hardware, 4) excessive costs pertaining to performing maintenance and migrations on process automation systems, and 5) requirements of having third-party communication interfacing compatibility as well as real-time communication networks.

Keywords : distributed control system, identification of risks, information technology, process automation system
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