

Title	既設プラント更新の国際プロジェクトにおけるリスク マネジメントの研究
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## Abstract

The risk management for the plant business has been relying on project managers' skill acquired through experiences and is not fully analyzed, which is evident from the fact that few case studies are found in the literature of risk management process models concerning the real plants. It is difficult to apply a theory to practice in case of plant since many factors are attributed to the experience of project manager. Establishing practical management methods for the plant business is a challenge in the future business development.

In this study we clarify the experience and skills of project managers and propose the risk identification, models for risk mitigation, and a standardized risk evaluation method as a solution. The proposed risk management process model forms a basis for comprehensive management covering site risks from quotation to the completion of commissioning. It also incorporates a practical method for the visualization and unified management of risks by the project manager. Furthermore, there are features such as a simplified evaluation for visualizing of risks by weighting, and a model of risks combined with countermeasures for risk mitigation.

We propose firstly a generalization of the risk events in the plant business as a standardized method for the visualization of risk and a simplified risk evaluation by the weighting for the occurrence of risk events and their impacts. Next, we apply the model of combination with risk countermeasures as the evaluation method of risk countermeasures and perform the weighting of the feasibility by specific countermeasures of risk.

We also propose an evaluation method of risk countermeasures and a practical risk response plan. In case of site risk we propose model for site risk evaluation which has possibilities for risk detection and risk avoidance, which has possibilities for mitigation of severity of the results.

In case of using the model and standardized method which are proposed in this study, the result which is verified by the actual data in the project is shown a tendency similar to the transition of risk evaluation point which is performed by veteran project managers. Accordingly, it is clear that it is effective in visualizing the result of risk evaluation, and we can confirm its effectiveness as a practical method for risk management. Further, since a generalization of the risk event is performed, this method is not related with the scale of plant, the margin of site schedule, the regionality of site. Therefore, it is considered that basic concept of the model and method has general versatility and also is applicable to risk management on project other than existing plant revamping of iron and steel plant facilities.

**Key Words & Phrases:** Site risk management, Risk evaluation, Risk evaluation metrix, Knowledge of experience, Risk chain