(8) Title

Risk Analysis of multi-purpose batch plants using STAMP/STPA

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Abstract

In the chemical industry, product life is getting shorter and shorter, and early introduction into the market is more important as competitiveness than production efficiency. For this reason, a system is required that not only constructs a dedicated plant, but also realizes new manufacturing by mastering general-purpose equipment, and also continues to manufacture conventional products. Therefore, flexible operation of multi-purpose/multi-batch is required, but problems arise due to contamination and handling of multiple products. Therefore, it is necessary to analyze the risk for operation, and addition of recipes must also be considered. However, HAZOP study is common as a risk analysis method in continuous plants, but development of a method to identify the risk of a batch plant on the premise of multi-purpose/multi-batch operation has not progressed. This is due to the difficult handling of changing piping structure and product quality, as well as by free operation methods. It is also the reason why measures to avoid risk are wide ranging such as top policies. Therefore, when considering risk analysis for batch plants, we need not only pay attention to ‘objects’ such as plant structures, but also new frameworks that expand analysis targets to software related to operations and human systems are necessary.

For the reasons stated above, we focus on STAMP/STPA which can deal with accidents caused by software and can be analyzed even to human systems and organizations. In this presentation, we will discuss the application of STAMP/STPA to batch plant in conjunction with cyber-attack which is a threat of control system in recent years.

Keywords

(1) Batch Process

(2) Risk Analysis

(3) Cyber Security