Anatomy of the Risk Matrix

Karl Van Seyoc, Reese Hopkins
Det Norske Veritas (U.S.A.), Inc.
1400 Ravello Drive
Katy, Texas 77449 USA
+1-281-396-1718

ABSTRACT

Risk Matrix examples are widely available in literature, and despite their apparent simplicity, they may be challenging to properly design and apply. The risk matrix is one of the frequently applied risk management tools used in the energy and chemical manufacturing sectors and across projects, operations, and construction activities. While standards like ISO 31000 provide guidance for designing a risk management process, limited information is available on the considerations for designing a risk matrix. Many standardized risk matrices are published yet organizations often choose to construct and implement company-specific risk matrices. A company-specific matrix can convey risk tolerance and support the evaluation and prioritization of risks. If improperly designed, the risk matrix may mislead decision-makers, undermine the credibility of the risk process and unintentionally promote unwanted events.

The paper examines characteristics of a well-designed risk matrix and describes potential pitfalls in design and usage for risk assessment and mitigation. A comparison of published risk matrices is made along with explanation of the appropriate applications. Emphasis is placed on problems associated with application of risk matrices for discrete hazard scenarios and the adaptations needed for continuous operations versus time-bound projects. Further elaboration regarding time-variant acceptance criteria is provided for consideration when risk tolerance is not constant. The paper provides practitioners and decision-makers with practical guidance and warnings about the design, use, and application of a risk matrix.

Keywords: Risk Management, Risk Matrix, Consequence, Likelihood, Frequency, Acceptance Criteria, Risk Mitigation