Technical Risk Management online – TRiM®online

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KEY WORDS
drinking water supply; Germany; online; risk management; software; Water Safety Plan

INTRODUCTION

With the publication of the technical standard W 1001 (DVGW, 2008) in 2008, the key elements of the Water Safety Plan (WSP) approach (Bartram *et al.*, 2009) became part of the German technical regulations of the German Technical and Scientific Association for Gas and Water (DVGW). Five years later, the technical standard W 1001 was transferred to the European standard DIN EN 15975-2 (2013). In 2018, the risk-based approach became finally part of the revised German Drinking Water Ordinance. On the basis of a risk assessment, a water supplier can now voluntarily apply to the public health authority for a deviation of the sampling plan with regard to the monitored parameters and the sampling frequency. Taking into account the current proposal of the new EC Drinking Water Directive (Council of the European Union, 2019), it can be assumed that risk management will be made mandatory in the near future. This is a challenge both for water utilities, which have to implement a risk management, and for the supervisory authorities, which have to assess a large number of risk assessments in a short period of time.

Experience in implementing a risk management in Germany and abroad shows that small and medium-sized water suppliers in particular have difficulties in implementing a risk management for their water supply system. Due to their operational structure, they often have only limited human, financial and technical resources as well as limited methodological knowledge to implement a risk management. In addition, many German water suppliers are organized as municipal utilities and supply customers not only with water but also with electricity, gas or district heating. Therefore, it is important to come up with a solution that provides a comprehensive methodology and is not limited to water supply.

To break down these implementation barriers, the IWW Water Centre has carried out a R&D project co-financed by innogy SE and in cooperation with four German water suppliers between 2015 and 2018. The aim of the project was the development of a self-check for small and medium sized water suppliers for the implementation of a risk management. For this purpose, the web application TRiM®online (Technical Risk Management online) was developed.

METHODOLOGY/PROCESS

First, the requirements for the self-check were defined together with the participating water suppliers. It was necessary that the self-check meets the methodological requirements of the DVGW W 1001 and DIN EN 15975-2, can be processed without comprehensive background knowledge on risk management, and can be implemented with limited effort.

In order to support the user in processing the risk management, as much as possible has been pre-structured in the form of lists or selection fields. Following the methodology of W 1001, the user starts with the description of the supply system by adding all elements of the water supply system – from catchment to consumer. The supply system can be described in TRiM®online with the help of a predefined structure of supply steps (e.g. catchment, treatment, storage, distribution) and supply elements (e.g. boreholes, storage tanks, pumping stations, mains).

Triggered by various hazardous events, hazards in the form of qualitative (biological, chemical, physical) and quantitative (continuity, volume, pressure) impairments can occur during any step in water supply. In TRiM®online, the hazard analysis is condensed in form of lists (see Figure 1) of selected hazardous events and resulting hazards for planning, construction, operation and maintenance of water supply systems. Lists have been compiled on the basis of the DVGW standards and further regulations as well as experience of IWW and of the participating water suppliers. The hazard analysis was one of the decisive steps in the project, as the level of detail of the lists largely determines the amount of work required to process the risk management. Thus, a balance had to be found between the effort and the benefits of the implementation of a risk management.

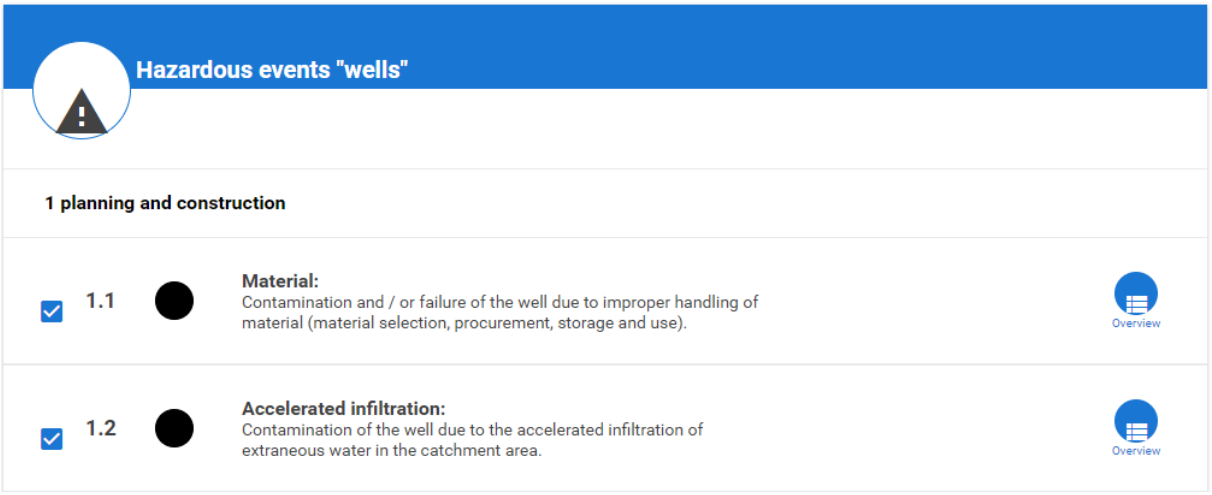

Figure 1: Screenshot of a hazard list from TRiM®online (www.trim-online.de)

Subsequently, the hazards and hazardous events are assessed with regard to their risks for each supply element using a 3x3 risk matrix and taking into account existing measures (for control or mitigation). Risks can be assessed using suggested definitions or supplier-specific definitions for the likelihood and severity. If the identified risk is too high, further measures can be defined with corresponding deadlines and responsibilities. For the documentation of the risk management, tables with results are created fully automatically in TRiM®online, which clearly summarize the risk assessment and the defined measures ("to-do list"). All tables can be filtered and exported in the filtered view. The most important risk management results are graphically summarized in the form of a management dashboard. In addition, it is possible to generate a risk report from the results.

RESULTS/OUTCOMES

Outcome of the R&D project is a self-check in form of a web application called TRiM®online. The specified methodology and the collection of relevant hazards as well as suitable measures for risk control enable users to process high-quality risk management with little effort. In order to ensure that the risk management is up-to-date, the content is updated every six months. Updates include hazards and hazardous events, measures and references to the regulations and laws.

DISCUSSION AND CONCLUSION

TRiM®online supports water suppliers to implement a risk management according to the key elements of the WSP approach and the German technical standards. However, feedback from municipal utilities has shown that a methodology limited to water supply obstructs a broader application of a technical risk management. Therefore, all sectors (e.g. electricity, gas, waste water) are to be successively added in TRiM®online to ensure a consistent methodology. For the adaptation to the gas sector, a follow-up project with several participating gas suppliers will start at the beginning of 2021.

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