

## **Abstract**

The thesis examines the security concerns connected with the critical infrastructures in the water management sector, specifically hydraulic structures comprising the drinking water supply system. The thesis focuses on systemic risk and reliability assessment as a component of contemporary principles and security practices comprising the critical infrastructure protection (CIP) framework. The foremost objective is to explore to which extent Czech domestic procedures peruse the international expertise when assessing systemic risks stemming from the dependencies and interaction of water supply chain components. Investigating the present-state risk assessment relates strongly to the policy development at the European Union level. For that reason, the thesis commits particular attention to the Council Directive 2008/114/EC and Directive (EU) 2020/2184 and their impacts on the management and operation of critical infrastructures in the water supply sector. The thesis also studies the state-of-the-art reliability assessment methods for water distribution networks. The acquired knowledge is utilised to estimate the reliability of a study distribution network using stochastic simulation and survey selected network robustness-improving solutions. The thesis identifies the critical elements of a water supply system and delineates hazards to water infrastructure both of natural and anthropogenic origin. It concludes that while formal, structured risk and reliability assessment procedure is yet at the onset in the water supply sector, the Czech water management sector already harnesses international expertise, for example, in flood risk assessment, and contributes to its advancement at the European level.