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ROOTING OUT RESILIENCE

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Abstract

Global threats such as climate change, rapid population growth and urban densification continue to pose increasing and significant threats to the UK water industry. Recent and continued changes, to the notion of resilience, mean that it is now widely thought of and referred to as both a key characteristic to build throughout the water industry, as well as an achievable outcome used to respond to emerging threats. Such developments have been made all the more important for the industry, given the legal duty within the Water Act 2014 to 'secure the long- term resilience of water supply and sewage systems' as well as the industry regulators role in enforcing this.
The complexity that exists within a sector such as that of water, one that consists of the merging of social, ecological, technical and economic systems, combined with ever increasing levels of uncertainty have resulted in the acknowledgement of a need for a drastic increase in sector wide resilience. However, how resilience based actions and measures are not only implemented but also accurately measured remains a challenge for most.
Currently, multiple resilience toolkits and frameworks exist, however the majority of these are often centred around the measurement of individual technical system characteristics rather than overall whole system performance. Although both are useful and undoubtedly related, it is performance that a company and system must deliver in order to effectively deal with emerging threats, achieve regulatory requirements, thrive and prosper.
In order to achieve the aim, the research I am conducting will focus on the development of a method to evaluate and measure the current level of resilience within one UK water and wastewater company. The study will include evaluation of both physical (infrastructure) and social (staff and customers) properties of the system using a case study approach of when the system has failed to reach its required level of performance. It will initially be focussed on the wastewater operations section of the business. To start, basic regression analysis will be performed on both social and physical system properties and regulated performance indicators to explore the dependencies and relationships that exist. Quantitative results from this analysis and qualitative data collected from interviews with stakeholders based around the RAG framework (Hollnagel, 2015), will be combined in an ANN. It is hoped that the model produced will be able to identify requirements for the response, adaptability, monitoring and learning, necessary to maintain performance during a disturbance. At the time of writing, background research had taken place along with some preliminary analysis of a sample set of data.

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