

CONSIDERATIONS FOR SELECTION OF ENERGY DISSIPATION VALVES

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ABSTRACT

Water and wastewater conveyance systems often require the use of mechanical flow control devices to dissipate energy. Examples of these situations include pressure reducing and sustaining valves for in-line pressure reduction, preventing free-draining of pipes, free discharges from pressurised mains, and bypasses around hydro-electric power plants.

The characteristics of each situation are unique and requires a high degree of consideration to identify the suitable options and to, ultimately, reach a well-considered solution. Valve manufacturers play a major role in determining feasible solutions that meet the specific needs of each situation, particularly in provision of quality test data.

The consequences of inappropriate valve selection include higher capital, operation and maintenance costs, the need for additional monitoring, pre-treatment or actuation, nuisance noise and vibration, poor flow or pressure control, or excessive wear and cavitation leading to premature failure of the component or pipeline.

This paper outlines some common applications that require energy dissipation valves, the types of control devices available, and their characteristics and suitability to those applications. The considerations when selecting valves are discussed within the context of actual project examples from New Zealand and Australia. The options considered, design, construction and operational challenges faced, the solutions to overcome them, and the lessons learned will be presented in this paper.

KEYWORDS

Valves, energy dissipation, conveyance, water, wastewater