

## DeZURIK HILTON BONNETED THROTTLING KNIFE GATE VALVE

Throttling valves are used on the outlet of dams to regulate the release of water for level control. The primary objective of this type of valve is free discharge of water into the atmosphere, often under a high differential pressure. Most valves are not suitable for free discharge service. Bonneted throttling knife gate valves specifically designed for this service offer an economical option for low-head applications up to 230 feet of head (70 meters), or 100 psi (690 kPa). They are less expensive than valves designed for high head applications (over 100 psi, 690 kPa) such as jet flow gates and fixed cone valves.

### **PROBLEM:**

High head valves that operate at over 230 feet of head (70 meters), or 100 psi (690 kPa), are too expensive for outlet valves on low head dam applications. Less expensive standard knife gate valves are not designed to handle these high velocity free discharge applications. Standard knife gate valves will not work in this application because the high velocity flow to free discharge causes vibration and cavitation due to the rounded gate and design of standard knife gate valves.

The gate of a standard knife gate valve's leading edge is rounded, so as the valve is opening or closing the tip of the gate is cantilevered into the port. Because of the unsupported distance between the tip of the gate and the contact points between the gate and the seat, water pressure causes the gate to rock back-and-forth in the flow, creating damaging vibration and noise which can be harmful to both the valve and dam.

Additionally, with a standard knife gate valve, the discharge flange is the same size as the inlet flange, which will not allow sufficient airflow to enter the discharge side of the valve to prevent cavitation.



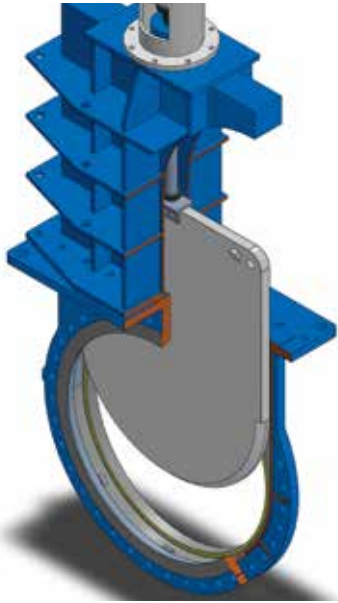
A Hilton Throttling Knife Gate Valve is installed at a California dam project.

## SOLUTION:

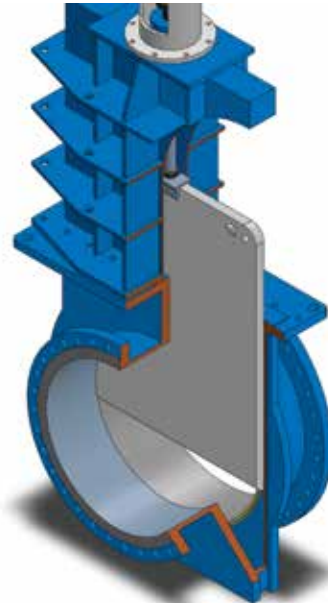
The Hilton H-340-B bonneted throttling knife gate valve is specifically designed for low-head, free-discharge applications. This design uses a square gate so the end of the gate is not cantilevered into the port. This prevents vibration and noise by fully supporting the gate over the complete travel length.

In addition, the H-340-B valve features an oversized outlet flange which prevents cavitation by providing increased airflow on the discharge side of the valve. In certain cases, such as the use of an extended discharge pipe, modifications can be made to the H-340-B valve to provide additional air venting as required. The H-340-B bonneted throttling knife gate valve is typically built with extended flanges which further stiffen the body for this severe service.

The H-340-B bonneted throttling knife gate valve has similar features compared to valves designed for high-head free-discharge service, but is more economical. The H-340-B bonneted throttling knife gate valve is accepted for this application by the U.S. Bureau of Reclamation and many municipal water districts. The H-340-B bonneted throttling knife gate valve has been installed and operating successfully at many facilities around the U.S.



The standard knife gate valve has a rounded gate edge and the discharge flange is the same size as the inlet flange.



The Hilton Throttling Knife Gate Valve has a square gate and an oversized outlet flange for increased air flow.

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[www.dezurik.com](http://www.dezurik.com)  
[info@dezurik.com](mailto:info@dezurik.com)

250 Riverside Ave. N.  
Sartell, Minnesota 56377  
Phone: 320-259-2000  
Fax: 320-259-2227



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