

INTERMEDIATE SPILLWAY CONTROL SYSTEM

One of the largest concrete dams currently in the commissioning process in Spain relies on ORBINOX for a challenging flood control solution

Application: Dam spillway

Challenges

- 10m differential in reservoir level
- Flowing at a 450m³/s entry, throttling down to 30m³/s at constant flow conditions

Solution

- Flush bottom bonneted sliding gate as a guard valve
- 4 side sealing radial gate as service throttling valve

Result

- An extraordinary flood control capability

All dams have a spillway at the crest that act as a safety limit in case of maximum filling of the reservoir. Sometimes the maximum level needs to be variable and is normally controlled by opening or closing the spillway gates. However, the variable level is limited by the height of the gates.

What if a much larger variation of the level of the reservoir is needed?

ORBINOX was invited to participate in this challenging flood control solution in the Castrovido reservoir. It is a massive 800,000 m³ concrete dam located in Burgos – Spain which has 2 spillway systems. The first is fixed at 1,042m, and the second is an innovative bottom spillway located at 1,032m, controlled by ORBINOX gates. This provides an extraordinary lamination capacity capable of effectively controlling floods and the required design for a 5,000 years flood (the maximum flow by statistics during a 5.000 years period)

“We need to be able to control the periodic floods of the *Arlanza River*”

ORBINOX Proposal

Guard valve

Bonneted sliding gate
 Size: 1750x1600
 Design pressure: 25 m.w.c.
 Body: Carbon steel + 304SS seats and sliders
 Gate: Carbon steel
 Seals: EPDM
 Actuator: Hydraulic cylinder

Service valve:

Radial Gate 4 side sealing
 Size: 1750x1250
 Design pressure: 25 m.w.c.
 Body: 304SS
 Gate: 304SS + Carbon steel arms and ribs
 Seals: EPDM
 Actuator: Hydraulic cylinder



The bottom spillway system controlled by ORBINOX gates will provide a $30\text{m}^3/\text{s}$ constant flow condition, while the reservoir goes from a 44 hm^3 maximum normal level up to a 70 hm^3 controlled flood level. An extraordinary flood control capacity in a challenging river.

