

2004

Best Wishes

The continuing sluggish growth in the world major economies also impacted our industry, which is to a large degree dependant on government investment programs. However, because of the depth of our experience and the uniqueness of our system, the Hydroplus Fusegates were used in 2003 on three major projects in three different continents: Beni Amrane dam in Algeria, Dartmouth dam in Australia, and the Terminus dam in the United States, to be completed early 2004. We are also involved in the Jindabyne dam project in Australia, for which the conceptual design has already been completed.

The coming year will be challenging in many ways. Continuing R&D will take us a step further with the recoverable Fusegates. Studies and testing are in progress in Russia.

Apart from its deployment on dams (currently over 40 around the world), Fusegates are also being strongly considered for various river flood management projects. The demand is driven by increasingly larger populations at risk and higher flooding potential.

Throughout 2004 we will continue to work within the dams industry to advise how the system can add benefit to the different projects we are exposed to. We will also publish technical articles and attend several dams conferences around the world.



2004 marks the 10th anniversary of four more dams equipped with Fusegates: Caillaouas dam in France, Shongweni dam in Republic of South Africa, Wanakbori dam in India, and Puylaurent dam in France. With these projects the system has proven it can go the distance.

We thank you for your constant interest and we take this opportunity to wish you and your family a warm

Holiday Season, and a peaceful and prosperous 2004.

Julien Rayssiguier,
Managing Director,
On behalf of the HYDROPLUS team



DAM SAFETY

Reliability of Fusegates

Stakeholders involved in dam safety (owner/operator, designer, contractor, state regulator and public) have a responsibility and vested interest in the safe, efficient and reliable operation of their dams. The technical and economic constraints which must be managed to provide the level of safety desired are often considerable.

The philosophy of the HYDROPLUS system when applied to dam safety is generally to improve the maximum spillway capacity and to minimize the impact to the downstream population and environment during extreme flood.

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DAM SAFETY— Cont. of cover

Reliability of Fusegates

This philosophy is exemplified in two unique safety features of Fusegates that are not found on any other spillway control system:

- the minimum tipping level (MTL)
- the ultimate stability level (USL)



WANAKBORI DAM (INDIA) IN SPATE, CONTROLLED BY THE HYDROPLUS SYSTEM

The MTL is normally half way between the crest and inlet well level of each Fusegate. With reservoir level below the MTL, the Fusegate cannot overturn. Thus there is no risk of creating an artificial flood in the absence of an incoming flood.

The USL guarantees that the Fusegates will operate even if the mechanism that triggers their tip-off (flood water entering the inlet well) fails unlikely due to well blockage. Fusegates rotate at the USL only as a result of the hydrostatic pressure against the unit (i.e. no uplift in the base chamber).

Aware of their responsibilities, SNOWY HYDRO LTD, a reputable Australian corporate utility, recently completed a safety review of their dams. The approach that they followed to improve spillway discharge of their Jindabyne dam is of interest.

The feasibility study showed that construction of a new auxiliary spillway would offer the greatest benefits when all factors were considered. Whereas many stakeholders might content themselves to re-use classical solutions, SNOWY HYDRO LTD selected an innovative solution with application of the Fusegate System as a

spillway control system, instead of a fuse plug solution. The key selection factor was the reliability inherent to the Fusegate System. In addition, better utilization of spatial constraints, long term safety and cost factors favorably influenced their decision.

In the case of a fuse plug embankment, the design comprises an earth dyke over a concrete sill which would be partially or completely eroded if over spilled by water. The reliability of fuse plugs over extended life cycles still remains a concern for dam engineers.

Newspapers recently gave large coverage to the dramatic consequences of a fuse plug failure. The newly constructed fuse plug equipping Silver Lake in Michigan suddenly failed on may 14-15 without any significant incoming flood, likely due to inadequate design. The resulting artificial surge caused an estimated \$100 million in damage. Twenty homes were damaged or destroyed along with three businesses.



A GLIMPSE AT CONSEQUENCES DUE TO SILVER LAKE FUSE PLUG FAILURE

By contrast, the Fusegate System offers substantially the same standard of safety as uncontrolled spillways while offering the flexibility of gated spillways. In addition, contrary to fuse plugs, the Fusegate System achieves a controlled and progressive release of the flood water depending on the magnitude of the flood.

The safety features of the Hydroplus System are very significant advantages over all other existing spillway control systems.

AUSTRALIA

Dartmouth Overspilling

The Dartmouth dam project was commissioned on October 23rd, on time and within budget. The ten labyrinth crested Fusegates of 3.3 m-high by 5.8 m-wide are now overspilling on the free spillway sill.

Operated by Southern Hydro, the dam's rehabilitation was part of a project to meet peak electricity demand more efficiently.

The full supply level has been raised by 3 m, to increase the storage capacity by approximately 70%.



USA— TERMINUS DAM

Final Stage



The construction of the 6 huge Terminus Fusegates is nearing completion. The fifth one has now been cast and the project will be completed early 2004.

Recent Papers and Forthcoming Conferences

- **“Ruti Dam: Innovative Technology Contributes to Sustainable Development”**

By Daniel Euvrard, SAFEGE
S. Lacroix, HYDROPLUS
A. Muyambo, ZINWA
Hydropower & Dams
Issue 6, December 2003

- **HYDRO-2003 - Khadakwasla, Pune, India**

Indian Society for Hydraulics
December 26 and 27

Fusegate Concept:

Optimizing Dam Storage and Discharge Capacity
By S. Chevalier and A.K. Sud from HYDROPLUS

- **UNITED STATES SOCIETY ON DAMS Conference**

March 29 to April 2
St. Louis, Missouri, USA

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