THE AUSTIN ADVANTAGE

CAVERN ENLARGEMENT AT A GERMAN HYDRO POWER PROJECT

GENERAL **INFORMATION**

Location: Hydro Power Project in South-West Germany

Industry: Underground

Products Used: Paradigm, Emulex 2+, Shock*Star

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THE **HISTORY**

This Hydro Power Project in South-West Germany represents a major extension of an existing hydro-power facility with a total investment volume of approximately $300 million USD. The project required extensive underground development, including enlargement of caverns and tunneling operations, to increase power generation capacity and efficiency.

Austin Powder Germany GmbH was selected as a key partner for the blasting operations, leveraging decades of experience in providing tailored explosive solutions for complex infrastructure projects. From the start, Austin Powder's reputation for safe, innovative, and precise blasting solutions was instrumental in winning the trust of the project owner and construction partners.

THE **GOALS**

1. Increase Power Generation Capacity
2. Execute Safe and Precise Blasting Near Critical Infrastructure
3. Manage Complex Worksite Logistics with eight tunnel faces being developed simultaneously
4. Overcome Geological and Environmental Challenges
5. Optimize Time and Cost Efficiency
6. Achieve Fast, Consistent, and Safe Blasts for the Cavern Enlargement

CUSTOMER **CHALLENGE**

The cavern enlargement posed several technical and logistical challenges:

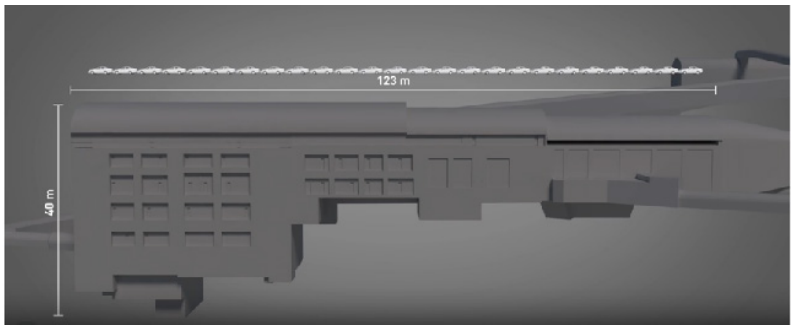
- Proximity to critical infrastructure: Blasting was carried out close to sensitive crane elements, ventilation systems, pumps, and power supply.
- Water management: Drilling and charging operations were complicated by water ingress.
- Restricted geometry: At the beginning of the cavern, the limited height and narrow working areas created additional safety and logistical issues.
- Infrastructure protection: Concerns arose about the need for heavy blasting mats to protect cranes and other equipment. In total, the project demanded high performance blasting techniques, a collaborative technical concept, and strict adherence to safety and environmental standards.

THE **AUSTIN** SOLUTION

Austin Powder worked closely with the construction company to design and implement a tailored blasting concept, approved by the project owner and their consultants. The project was divided into two phases:

Phase 1 – Austin Powder (RoG) Execution

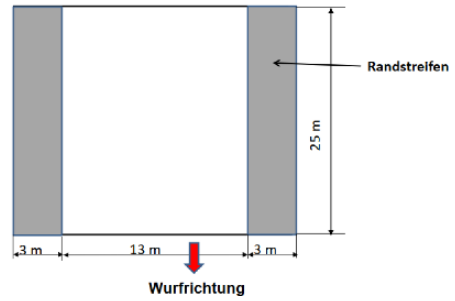
- Focused on blasting the center part of the cavern using vertical boreholes.
- Borehole diameter: 64mm (2.5”).
- Borehole length: up to 4.4m (14.5 ft).
- Planned drilling pattern: 1.5m x 1.5m (5ft x 5ft).
- Actual pattern achieved: +20–25% improvement.
- Explosives used: 50/700mm cartridges (1.8kg) of Emulex 2+.

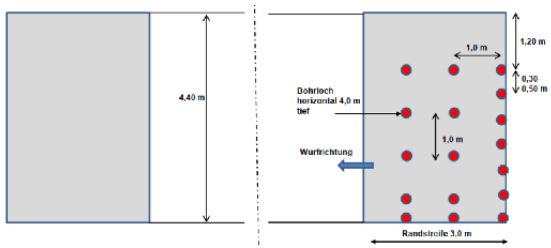


THE **AUSTIN** SOLUTION

Phase 2 – Construction Company Execution

- Side parts of the cavern were blasted with horizontal boreholes.
- Explosives used: o 35/700mm Emulex 1 cartridges o 25/1000mm Emulex C cartridges
- Borehole length limited to 4.4m.
- Austin's technical guidance allowed for controlled blasting without heavy blasting mats, reducing both time and cost. Additional Measures
- Explosives mix: Use of Emulex cartridges and Hydromite 100 optimized performance.
- Collaborative testing: Trial blasts confirmed safety and feasibility of operations without excessive protective measures.





THE **OUTCOME**

The project showcased Austin Powder's ability to deliver safe, productive, and precise blasting operations under challenging conditions, reinforcing the company's reputation as a trusted partner for complex hydro-power and tunneling projects worldwide.

- 5,000 blasts carried out safely and successfully.
- Excavated 5,700m (3.5 miles) of tunnel.
- Daily throughput of approximately 4,500 tons.
- Cavern enlargement required 25 controlled blasts, converting an expected 65,000 tons of rock into 72,800 tons, exceeding initial projections.
- Final blast completed on 21 August, marking the successful conclusion of cavern enlargement activities.

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