



HYDROMECHANICAL ENGINEERING

Hydromechanical steel structures – Solid construction – Drive technology



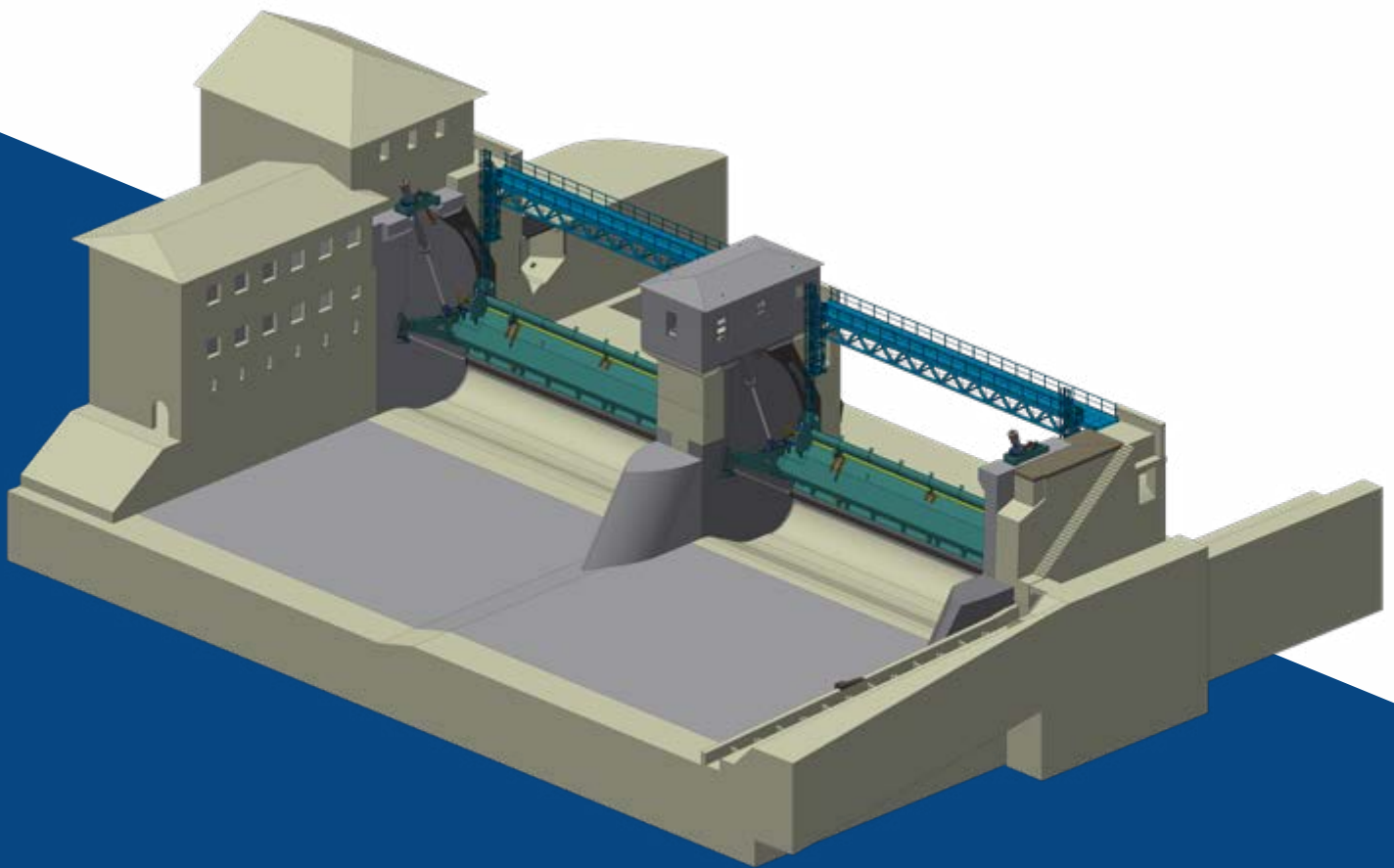
**HYDROMECHANICAL STEEL STRUCTURES
SOLID CONSTRUCTION
DRIVE TECHNOLOGY**

Economic plants for the future

Hydromechanical structures require high investments, durability and ease of maintenance. An inter-disciplinary team with expertise in hydromechanical steel structures, mechanical engineering and solid construction offers you capability from one source – this is the key to technically and economically ideal solutions.

Each hydromechanical structure is unique and requires tailored solutions. The complex interrelations from the requirements in the construction stage and the safe and low-maintenance

operations to provisions for the easy access to and maintenance of all components call for experience and foresight from the first considerations regarding new construction or modification.





2

Overall, several hundred hydromechanical structures have been designed and implemented for Germany, Europe, Africa, Asia and the Americas. The majority of the plants and gate types used in these hydromechanical steel structures was designed and constructed by us. In this regard, several pioneering developments in hydromechanical engineering were significantly influenced and shaped.

WE DESIGN

- + Locks (river and sea locks)
- + Mobile weir systems
- + Mobile flood protection systems
- + Weir and lock walkways
- + Ship lifts
- + Run-of-river power station equipment
- + Pumped storage scheme equipment
- + Barrage and dam equipment
- + Inspection gates and stop-logs
- + Penstocks
- + Mobile bridges
- + Cill galleries and diving tunnels
- + Ferry terminals
- + Trash rack cleaning machines
- + Fish ladders
- + Quay walls
- + Pumping stations
- + Special structures

Apart from the hydraulic drive mechanism used most frequently for moving gates, electric lifting cylinders as well as lantern pinion, rope and chain drive systems are designed. Our competencies also extend to connecting hydromechanical components to solid structures and electrical equipment.

Hydromechanical equipment is designed for marine tidal areas (influences from saline sea water, brackish water, sand, silt, waves, etc.), for high mountain influences (bed load, ice, snow, low temperatures, etc.), for desert influences (windborne sand, high temperatures, etc.), as well as with regard to earthquake loads. Whenever concrete and steel have to withstand water, we provide hydromechanical engineering and hydromechanical steel structures design, from small to large plants, from new constructions to refurbishment.



3



4

- 1 Viereth weir system on the river Main near Bamberg
- 2 Kaiserschleuse lock of Bremerhaven
- 3 Niederfinow ship lift
- 4 Würzburg lock weir
- 5 Brunsbüttel, 5th lock chamber on Kiel Canal
- 6 Kattwyk New Railway Bridge, drive system (Hamburg)
- 7 Eggberg basin of Schluchseewerke
- 8 Standardised mitre gate on the river Neckar
- 9 Dortmund-Ems Canal upstream radial gate
- 10 Dortmund-Ems Canal downstream mitre gate

5

From the idea to the completed project

INVENTORY INSPECTION

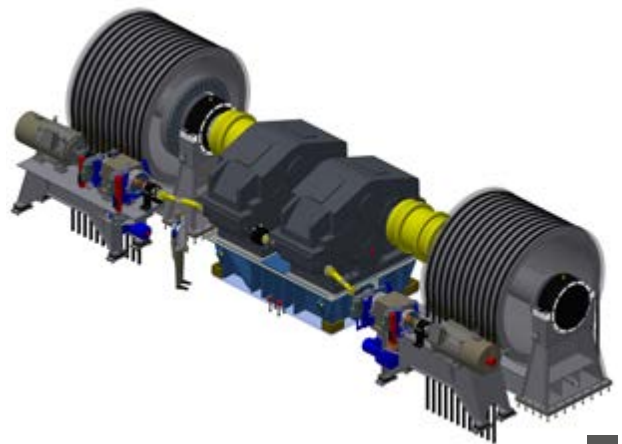
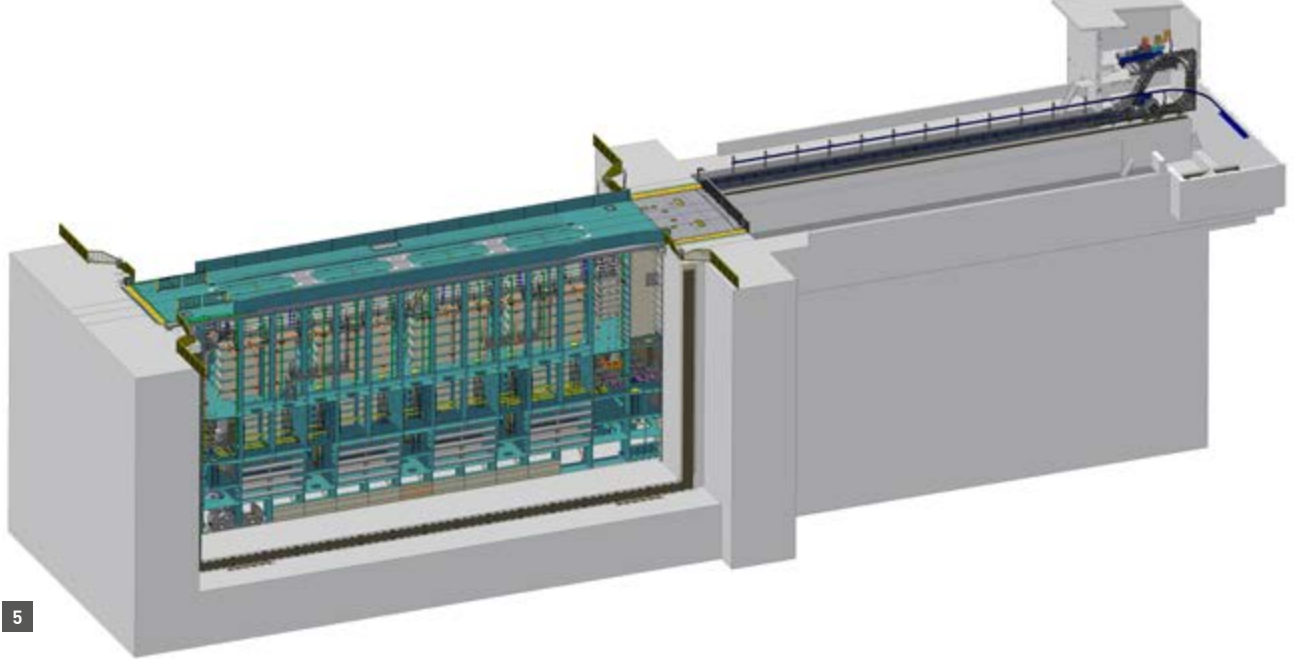
- + Inventory inspection and assessment
- + Inspection of constructions and equipment
- + Damage surveys

PLANNING

- + Consultation
- + Project planning
- + Structural design
- + Technical equipment and mechanical engineering
- + Standardisation planning
- + Elaboration of specific proposals and solutions
- + Inspection and maintenance planning
- + Installation planning including auxiliaries and procedures
- + Refurbishment planning for existing plants
- + Modification and upgrading planning for existing plants
- + Stability recalculation
- + Preparation and review of contract award documentation
- + Fire prevention planning
- + Corrosion protection planning
- + Fluid dynamics computation (CFD)
- + Planning for work in contaminated areas and b (black)/w (white) separation

IMPLEMENTATION STAGE

- + Selection and evaluation of production and installation companies
- + Manufacturing supervision in the workshop
- + Construction supervision and senior construction management
- + Safety and health protection coordination (HSE)
- + Planning and support of functional checks
- + Project management
- + Project control and coordination
- + Cost control
- + Interface management
- + Operations and timeline control
- + Commissioning and start-up planning
- + Test runs and test run planning



6

INSPECTION AND SURVEYOR ACTIVITIES

- + Surveys and recording
- + Review of manufacturing and workshop drawings
- + Design review
- + Design assessment
- + Design optimisation
- + Examination of structural analyses
- + Expert opinion statements
- + Evaluation of ventilation and vibration issues
- + Supervision and support of model tests
- + Structural review of documents for solid construction and hydromechanical steel structures

QUALIFICATIONS

- + Welding engineer pursuant to DSV-IIW 1170-IWE
- + Non-destructive testing – dye penetration testers, PT levels 1+2-381
- + Non-destructive testing – visual inspectors, VT levels 1+2-219
- + DIN-certified paint-coating inspectors (DIN Certco level C)
- + TRGS experts, 524/BGR 128 (Annex 6a) – NEW: DGUV Rules 101-004
- + Expert planning for protection and maintenance of concrete structures – DPÜ
- + Concrete technology training pursuant to DIN 1045-2 Section 9.6.1 and DIN 1045-3 Section B.1(1)
- + Inspection engineer for construction technology pursuant to BauPrüfVO, solid construction and metal structures
- + Expert for fire prevention
- + Safety and health protection coordinator (HSE)



7

8



REFERENCES (EXTRACT)



LOCKS

- + Kaiserschleuse lock of Bremerhaven, Germany
- + Brunsbüttel sea lock on Kiel Canal, Germany
- + Neckar standardisation conception, Germany



WEIRS

- + Horkheim on the river Neckar near Heilbronn, Germany
- + Viereth on the river Main near Bamberg, Germany
- + Würzburg on the river Main, Germany



FLOOD PROTECTION

- + Ladenburg on the river Neckar near Mannheim, Germany
- + Ipswich on England's east coast, UK
- + Ems barrage on the river Ems near Emden, Germany



SHIP LIFTS

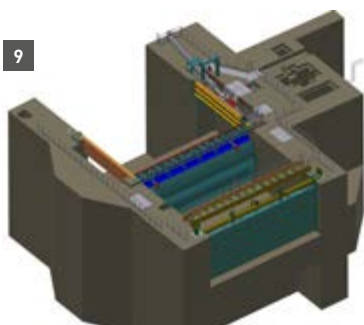
- + Niederfinow, Germany
- + Three-Gorges Dam, China



MOBILE BRIDGES

- + Kattwyk New Railway Bridge in Hamburg, Germany
- + Mittersill lifting bridge across the river Salzach, Austria
- + Rethe flap bridge in Hamburg, Germany

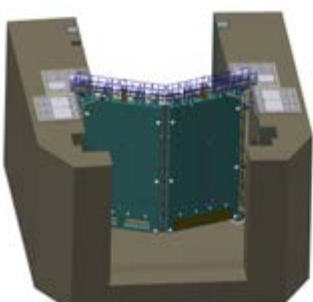
9



HYDROPOWER

- + Inspection gate for inlet structures of the barrage Bleiloch and Hohenwarte, Germany
- + Roller gates for the turbine inlet of Venda Nova pumped storage scheme, Portugal
- + Bottom outlet for Picote pumped storage scheme, Portugal

10



SPECIAL SOLUTIONS

- + Wilhelmshaven diving tunnel, Germany
- + Trashrack cleaning machine Rheinfelden, Germany
- + Floating inspection gates for weirs in Viereth, Ottendorf and Schweinfurt, Germany



SURVEYS

- + Ship impact on the weir in Limbach, Germany
- + Penstock for Waldeck pumped storage scheme, Germany
- + Damage survey for trashrack cleaning machine of Megolo power station, Italy

Close to client. Deep in the project.

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