

**S U R F A C E   F A C I L I T I E S**



Untergrundspeicher-  
und Geotechnologie-  
Systeme GmbH

## SURFACE FACILITIES

**U**ntergrundspeicher- und Geotechnologie-Systeme GmbH (UGS) is a company specialised in underground storage, a technology aimed at the safe, cost-effective and environmentally friendly storage of energy carriers, raw materials and chemical products in deep geological formations. The specific advantage of our highly experienced engineering and service company is that we offer the full range of services, everything necessary to carry out underground storage projects from pre-investigations to the commissioning and operation of turn-key facilities. This includes all geological, engineering, drilling, workover and leaching processes.

The design, construction and operation of underground storage facilities would be unthinkable without sound engineering services in the field of

### SURFACE FACILITIES TECHNOLOGY

UGS staff encompasses in the fields of process development, civil engineering, mechanical and piping engineering as well as electrical and control systems engineering more than 50 specialists. These specialists are in charge of all the equipment and facilities between the well heads and the pipeline so that the underground storage facility can do the job it was designed and constructed for. They are experienced in commissioning facilities and are supported by specialists in CAD, process simulation as well as document management. They can team up, as required, with experts from the world-wide acting Geostock group.

Close and flexible co-operation with specialists in the Geology and Reservoir Engineering Department as well as in the Subsurface Engineering Department, based on customer wishes, guarantees that the surface facilities are entirely in line with the subsurface conditions and use the latest know how.

Our highly competent purchasing department makes sure that materials and equipment are ordered and delivered according to specifications at a good price. The supervision of construction and commissioning is also carried out with our own personnel. The customer therefore has the advantage of the complete surface project from the first investigations to the commissioning and/or operation of a turn-key facility being carried out by a single company.

But we do more than planning and building new facilities. An important part of our work is the extensive reconstruction, modernisation and extension of existing facilities, so that they can be run more efficiently. Our expertise, experience and competence guarantee that this can in most cases be done while the storage facility continues to operate in compliance with highest safety standards.

Our Surface Facilities Department has successfully established itself on the market as a supplier of surface components such as leaching, brine injection, gas dehydration, heating and compressor equipment. We have maintained our market position because of our proven competence in underground storage, detailed knowledge and our readiness to meet any new challenges. Our customers can count on the highest quality and safety in the hands of a single company.

### SERVICES OFFERED BY THE SURFACE FACILITIES DEPARTMENT

- Comprehensive process simulation including the subsurface part of underground storage facilities
- Process development, analysis and optimisation
- Risk assessment studies
- Optimisation of storage operation mode, energy and consumable.
- Layout and design of facilities and units
- Piping design, pressure loss and flow calculations, vibration induced stress calculations.
- Determination of hazardous areas
- Development of automation concepts
- Permits and assistance in permit procedures (permissions, approvals, operating permits)
- Basic design and detail engineering
- Computer aided design and engineering
- Computer aided document management for the technical documentation of the facilities
- Issuing and updating of operational manuals
- Determination of investment cost, operational cost and project execution cost
- Comprehensive project management (project steering and organisation, project controlling, planning and execution of construction site )



**RANGE OF SERVICES OFFERED BY  
THE SURFACE FACILITIES DEPARTMENT**

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**Analysis** Investigation and evaluation of existing surface facilities related to their efficiency, their degree of automation as well as their operability and reliability including submission of indications and recommendations for future activities

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**Study** Conceptual design or re-design of the surface plants of underground storage facilities taking into account the geological preconditions, technical framework and technological boundary conditions. Evaluation of the chances of meeting the customer's targets and specifications. Estimation of investment cost

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**Simulation** Realistic modelling of complicated technical or scientific problems by means of computer programs (e. g. storage operation)

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**Basic Design** Development and presentation of optimized technical solutions, including the subsurface part. Design and dimensioning of the complete facility. Cost planning and time schedule

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**Detail Engineering** Detailed design including supporting data for all branches involved, serving as basis for procurement, manufacturing and assembling of the plants, components and equipment.

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**Purchase** Definition of the specifications for material and equipment serving as basis for tendering and procurement. Requesting and evaluation of offers. Placing of orders or recommendations for awarding. Assistance to the customer until the acceptance of supply.

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**Construction supervision** Overall construction management including procurement when appointed as general contractor. Specialist construction supervision for all branches until commissioning and operation.

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**Commissioning** Assistance to start-up and heading of commissioning. Training of operational staff.

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**Operation** Management of operation, as requested by the client

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**Supply of Facilities** Supply of complete facilities or units including all necessary services (design, manufacturing, supply, start-up and commissioning, provision of documentation and certificates)

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**Document Management** Configuration design in order to organise the large quantities of technical documents of facilities and plants. Data acquisition and data input to computer systems. Updating and upgrading of technical documents.



## **SOME OF THE REFERENCES OF THE SURFACE FACILITIES DEPARTMENT**

Experiences gained over decades, know-how and innovative solutions are characterising the efficiency and capability of the Surface Facilities Department. Recent references include:

### **Leaching plant Dähre/Peckensen und underground gas storage Ellenberg**

- Design, supply and commissioning of the leaching plant Dähre/Peckensen
- Design, construction supervision, commissioning and temporary operation of the surface facilities of the natural gas storage

### **Underground gas storage Chiren/Bulgaria**

- Rehabilitation and revamping of an adsorption column for gas dehydration and supply of a glycol regeneration unit

### **Underground gas storage Diadema/Argentina**

- Assistance to commissioning of the underground storage facilities (joint action with Geostock)

### **Underground gas storage Kraak**

- Design, construction and operation of the leaching plant including micro-filtration for brine disposal into deep geological formation
- Design and construction supervision, start-up and commissioning of the surface facilities of the natural gas storage
- Computer aided document management and updating of the technical documents

### **Underground gas storage Bad Lauchstädt**

- Converting of the salt caverns and the surface facilities from storing coal gas to natural gas storage. Revamping and extension of the storage facilities
- Design and supply of two complete dehydration units

### **Underground gas storage Degirmenkoy and Kuzey Marmara/Turkey**

- Basic design, tender documentation and consulting during construction phase for a natural gas storage to be established in two separate depleted gas fields in co-operation with Geostock

### **Underground gas storage Kalle**

- Revamping and extension of the surface facilities of the natural gas storage

### **Underground gas storage Allmenhausen**

- Design and construction of the pressure reduction station

### **Underground gas storage Bernburg**

- Comprehensive rehabilitation and revamping of the surface facilities of the natural gas storage

### **Underground gas storage Staßfurt**

- Design, construction supervision, start-up and commissioning as well as temporary operation of the natural gas storage including the first-gas-filling facility

### **Underground gas storage Kirchheilingen**

- Rehabilitation of the surface facilities in connection with converting the underground storage from storing coal gas to natural gas



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