

# Service catalogue



Subsurface engineering



Surface engineering



Drilling services



Operation management



A COMPANY OF



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Services from a single source – that is the strength of Untergrundspeicher- und Geotechnologie-Systeme GmbH (UGS GmbH). By combining project management, engineering and drilling/workover facilities in a single company, you reduce the interfaces in your project, get solutions that take all aspects into account and guarantee safe and efficient operation. We are also happy to take over the management of the leaching, the first gas injection or the complete storage facility for you.



Whether you order a feasibility study or an entire turnkey underground storage facility, your requirements always have first priority with us. In the process you benefit from over 50 years of experience and our reputation for always responding to any new challenges with understanding and flexibility. Consequently UGS GmbH is committed to research into new market demands and develops its own software and solutions for processing complex tasks.

Safety and quality are integral parts of our service. We are certified in compliance with all important systems and implement them successfully. Let us find the best solutions together to make your project successful.

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# Subsurface engineering



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# Subsurface engineering

## General services

### Engineering planning

- Preparation of feasibility studies and location studies
- Draft planning with rough cost estimate and schedule
- Specification of the technical equipment
- Work discussions and specialist meetings with service providers
- Technical/Commercial tender evaluations, preparation of contract awarding recommendations
- Checking confirmations of order
- Preparation of documentation for the approvals process
- (Main, location and final operation plan, special operation plans etc.)
- Participation in negotiations with authorities
- Development of detailed implementation projects
- Planning of organisation and dates for the entire project process
- Preparation of risk assessments
- Interface coordination of the service trades
- Project, safety and quality management (HSE)
- Research and development of special solutions and technologies

### Work supervision

- Management of tasks for carrying out the project on site and supervision in terms of compliance with the planned and agreed process as well as the generally recognised rules and relevant regulations that apply
- Technical supervision (back-up engineering)
- Managing documentation such as daily reports, installation protocols etc.
- Carrying out construction site meetings and safety meetings
- Coordination of service and supply companies involved in the realisation of the work
- Consultation with authorities, experts and people authorised to operate external facilities
- Cost control and auditing (technical and commercial)
- Preparation of final documentation (incl. verifications and disposals)



# Subsurface engineering

## Drilling/Plugging/Reservoir engineering

- Conductor pipe and spring wells
- New wells (vertical, horizontal, directional, S-shape and side-track)
  - Exploration wells
  - Cavern wells
  - Disposal wells
  - Storage facility drilling (into aquifers, deposits, existing storage facilities etc.)
  - Geothermal wells
- Drilling planning with the Landmark software solution
- Completion and/or repair of wells
  - Open-hole and cased-hole completions
  - Packer installation with and without subsurface safety valves
  - Filter installations with gravel packs (incl. Synthetic resin gravel packs)
  - Milling and renewal of casing strings
  - Partial backfilling and deviation from wells
  - Perforations
  - Stimulations (acidifications, washings and clean ups etc.)
  - Installation of disposal wells with GFK tubes (last casing)
- Coiled tubing work, slick and wireline work
- Well head replacement
- Reservoir modelling with ECLIPSE (3D reservoir simulation), storage management
- Discharging of pore space storage facilities to be decommissioned
- Production tests of pore storage wells (production and disposal tests)
- Plugging of gas storage, water and disposal wells in accordance with the applicable guidelines
  - Re-workover and plugging of old wells
  - Complete liquidation of storage facilities, e.g. The Ketzin facility (from 2000 to 2005, 41 wells and 39 levels plugged)
  - Plugging of wells with possible or known back tube circulation
    - Window milling into casing strings in a suitable sealing horizon zone
    - Setting and testing of cement bridges in window areas
- Supervision of IWCF Level 4 – drilling, workover, coiled tubing and snubbing work
- Process and technology development, e.g. for tapping and/or new opening up of storage caverns



# Subsurface engineering

## Completions/Testing

- Designing, planning and specifying details of subsurface work for the re/completion and workover of cavern wells for natural gas, helium, nitrogen, brine, oil, petrol and ethylene /propylene storage media:
  - Workover, snubbing, coiled tubing, wire line and slick line work
  - Plugging open hole areas by means of cement bridges
  - Milling and replacing casing strings
  - Tube-in-tube cementation
  - Packer completions
  - Liner completions
  - Plugging of cavern wells
  - Cavern neck conditioning
  - Installation of subsurface equipment (pumps, plugs, valves, patches and gauges)
  - Perforation and cutting of casing strings
- Designing, planning and assessment of subsurface test work with respect to the integrity of installed components and cementation of cavern and production wells, including:
  - Tightness test of the shoe of the last cemented tubing on storage caverns (for gases/liquids)
  - Function tests of completions and individual components
  - Test work for localising and characterising any leakages
    - Ultrasound noise measurement
    - Glass fibre temperature measurements
    - Straddle pressure tests
  - In-situ stress tests (lithostatic stress conditions)
  - In-situ permeability tests
  - Strength verification for screwed and welded connections
- Supervision of workover, coiled tubing and snubbing work, test work, borehole measurement and slick line work.
- Process and technology development, such as permeability plugs in active annular spaces



# Subsurface engineering

## Leaching technology/Geology/Rock mechanics

- Leaching of storage caverns with blanket oil or nitrogen
- Subsequent leaching of partially gas-filled caverns.
- Brine technology measures for preparing rock-mechanically unstable storage caverns, through deployment of a spray brine process
- Interpretation and assessment of level measurements
- Software-supported leaching simulation with PCL, WinUpro
- First gas injection and subsequent gas injection of salt caverns
- Flooding with gas-filled storage caverns, deployment of water, NaCl or MgCl<sub>2</sub> brine as the flooding medium
- Storage geology
- Geological supervision of drilling, e.g. taking core and mud samples, determining the casing horizon
- 3D modelling – preparation of geographical models
- Interpretation and assessment of open hole measurements
- Groundwater monitoring, monitoring of disposal wells
- Efficiency analyses
- Groundwater balance, hydrochemical risk assessment (solubility/precipitation reactions)
- Hydro-geological, thermal observations
- Approvals processes
- Final operation plans for wells and storage facilities
- Rock mechanics
- Research and development of storage technologies, such as hydrogen storage, solid matter backfilling of salt caverns
- Software applications using PCL, WinUpro, PETREL, ECLIPSE, ArcGis, WellCAD and CorelDraw
- Supervision of leaching, workover, open hole logging and level measurements



# Subsurface engineering

## Borehole integrity/Construction and welding

- Technical assessment of the subsurface parts of underground storage facilities and hydrocarbon deposits, lifecycle analyses
- Integrity assessments of storage and pore storage wells
- Subsequent assessment of already filled wells
- Assessment of technical events, such as string demolition, slip systems, SSSV pressure surge issues – expert assessments
- Mining damage related analyses of boreholes
- Assessment and interpretation of anchor casing string measurements – transition to the mounting flange
- Annular space management
- Assessment and interpretation of cased hole measurements
- Casing inspection with preparation of verification of function
- Running in of welded tubes, welding of subsurface equipment
- Deployment of the friction welding unit, casing jack and Spider Plug.
- Supervision of construction and assembly, subsurface equipment, well head and cavern well head equipment
- Measurement systems for recording changes in tension in casings and production strings
- Material examinations of subsurface equipment
- Service operator assembly and commissioning of the Spider Plug, friction welding unit, casing jack, measurement systems on production casing strings for recording tension (tension monitoring system, strain gauge), borehole and cavern heads, special solutions
- Research and development of special solutions and technologies for subsurface and surface applications, such as the development of an operable tie back seal unit
- Software applications with SEW, ANSYS, INVENTOR, WellCAD, DIADEM, CATMAN, CorelDraw and AUTOCAD
- Supervision of welding and cased hole logging

# Surface engineering



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# Surface engineering

## Range of services

- Initial studies and initial plans (for new construction, modernisation, removal)
- Assessments of alternative options
- Consultancy service with the owner's engineer
- Engineering of new construction projects (green field)
- Modification and optimisation of existing facilities (brown field)
- CAPEX and OPEX investigations
- Project management/Project coordination, site management, commissioning
- (Turnkey) supply of special components (see Projects)
- Facility operation support (cost reduction/troubleshooting)

## Studies

### Technical

- Concept development and basic data preparation
- Analyses of current status and determination of reserve capacity
- Assessments of alternative options (compressors, drives, dehydration processes)
- Energy analyses of facilities and parts of facilities
- Arrangement of facilities, apparatus and processes
- Process simulation, thermodynamic calculations
- Simulation of the behaviour of reservoir fluids in phases
- Process/Equipment selection studies (incl. compressors)
- Process descriptions
- Preparation of tenders for engineering (tender documentation)
- Removal/Demolition plans

### Organisational

- Overriding scheduling for project processing and realisation
- Analysis of causes and solution proposals for operational problems
- Advising and consulting

# Surface engineering

## Studies

### Commercial

- CAPEX/OPEX assessments
- Optimisation of operation costs and analysis of operation data
- Business plans, budgets (+/- 50 %)
- Determination of removal costs

## Basic engineering/Front end engineering design

### Technical

- Determination of basic process-related elements
- Area flow chart and/or process flow chart
- Preparation of piping and instrumentation diagrams and data sheets
- Dimensions of piping (nominal diameters)
- Balancing quantities, energy and materials and calculating loss of pressure
- Process simulation
- Determination of operation parameters
- Arrangement and specification of facilities, apparatus and processes
- Preparation of control, safety and pressure release systems
- Dimensions of pressure release/blowdown systems
- Layout plan for the building(s) and piping
- Dimensions of piping (strength)
- Construction specifications, scope of construction work
- Electrical, measurement, steering and control engineering analyses of complex facilities
- Development of specification sheets
- Tender documentation for MV and LV switchgear
- Development of automation (configurator) systems
- Tender documentation for network substitute and emergency generators
- Calculations for lighting of rooms and external areas
- Arrangement of instrumentation, control and field engineering equipment
- Selection/Dimensions of the instrumentation, control and field engineering equipment
- Dimensions/Arrangement of well head controls



# Surface engineering

## Basic engineering/Front end engineering design

### Organisational

- Execution plans for processes (engineering, approvals and realisation)
- Hazard and operability (HAZOP) studies/Safe integrity level classification/Cause and effect lists
- Compilation of supplier and tenderer lists

### Commercial

- Cost estimate (+/- 30 %)
- Outflow of funds in annual tranches
- Value engineering

## Approvals planning

- Planning approval procedure (in accordance with the German BBergG/EnWG laws)
- Approval process in accordance with:
  - German mining law (BBergG), major accident ordinance (12th BImSchV), energy law (EnWG),
  - emissions law (BImSchG), water law (WHG), building law (LBO, BauGB)

### Technical

- Preparation of application documentation for working with the authorities
- Explosion zone identification and explosion protection documentation
- Preparation of public announcements
- Safety reports and impact analyses

### Organisational

- Material containment, participation procedures, transfer of rights, compensation, permission approvals
- Preparation and support of scoping appointments
- Coordination with public bodies
- Hazard and risk analyses
- Conducting HAZOP meetings



# Surface engineering

## Detailed engineering

### Technical

- Determination of land space requirement
- Specifications for hydrate and corrosion inhibition
- Definition of the health and safety requirements
- Checking and releasing the working drawings and calculation documentation of the contractor company
- Preparation (depending on previous planning phases) of:
  - P+I diagrams and data sheets
  - classes of pipe
  - site plans, layout plans and layout of facilities
  - construction drawings (above-ground and underground)
  - structured piping diagrams (2D and/or 3D) and isometric drawings
  - master steel-construction drawings, detailed drawings
  - welding work including pipeline bridges, platforms and supports
  - explosion protection documents
  - description of control systems, control circuits and standards
- Dimensions of:
  - pressure release/blowdown systems (flow rate restriction orifices)
  - safety relief valve, (design, discharge flow volume, size)
  - orifices (condensate/pressure release)
- Calculation of:
  - strength of tubes and moulded parts
  - tightening torques (flange connections)
  - shear discs

### Organisational

- Preparation, collaboration, carrying out and facilitation of HAZOP
- German Technical Inspection Association projects
- Creation of operation instructions for the entire facility
- Compilation of execution documentation by trade and/or implementation contract (hard copy and digital)
- Contracting components list



# Surface engineering

## Detailed engineering

Commercial

- Cost calculation (+/- 15 %) and quarterly outflow of funds
- Comparable life cycle costs for selected elements

## Procurement

Technical

- Development of tender documentation and/or technical specifications of instrumentation and control facilities, instrumentation, cathodic protection facilities, lightning protection, earthing, potential equalisation and surge protection
- Automation facilities and process control systems
- Process equipment (machines, apparatus and receptacles)
- Pipeline materials, valves
- Above-ground and underground services, for each specific trade as necessary
- Steel construction services assigned to technological facilities

Organisational

- Invitations to tender
- Tender evaluation
- Assessment of technical changes in offers
- Order placement recommendations based on functional and technical feasibility
- Participation in order placement negotiations or negotiation management
- Support in procurement/supply (approvals, queries with suppliers)
- Expediting
- Continuation of the project schedule, specification by facility
- Preparation of special and additional contract conditions
- Preparation of the order (involvement)

Commercial

- Cost quotation (+/- 5 %)
- Outflow of funds in accordance with contractual arrangements and dates of payment



# Surface engineering

## Project management/Project controlling

- Project management and coordination of all interfaces in the project phases
- Process-driven structuring of the project
  - Establishing a project structure plan
  - Definition of all project activities
  - Control of the project schedule logistics and quality assurance
  - Development and maintenance of a project schedule plan in different stages of detail
  - Establishing a quality assurance system, quality management
  - Budget and time schedule control
  - Requirement and change management
  - Control of the procurement processes
  - Reporting procedures/status reports with respect to keeping deadlines, project progress, HSE, budget and quality at agreed intervals along with any conflict solutions
  - Project completion report and establishment of total cost

## Realisation

Technical

- Construction support by the engineer
- Construction supervision and management (senior construction management and/or specialist construction management)
- Hazard assessments, risk assessments of construction site activities
- Organisation and coordination of the construction site, supply logistics
- Acceptance and checks of deliveries including documentation
- Organisation and preparation of the acceptances and/or approvals by experts (approved inspection agencies, structural analyses, etc.)
- Commissioning preparation and support, commissioning management
- Planning and support of test operation and performance runs
- Computational reassessment of the results of performance records on contractual operation parameters
- Preparation/Support of technical and commercial acceptances
- Preparation and support of handing over
- Monitoring of construction progress
- Report activities, incidents, progress in the reporting period
- Health and safety coordinator and/or site safety engineer



# Surface engineering

## Realisation

### Organisational

- Keeping and checking construction diaries
- Keeping and logging regular construction consultations
- Organisation of approvals for implementations
- Preparation and support of performance records
- Preparation of deliveries, reports and information that require approval

### Commercial

- Measurement checks
- Comparison of budget with actual costs

## Documentation

Preparation of the:

- operation manuals
- checking and maintenance lists (maintenance planners, preliminary work SAP-PM)
- final documentation including as-built documentation from the suppliers/performing parties
- as-built review of the P+I diagrams
- as-built review of the operation instructions for the entire facility
- fire prevention/fire service plans
- changing, duplicating and scanning of all documents (hard copy and digital)
- populating and maintenance of the document management system
- checking of supplier/process plant documentation

# Surface engineering

## Software

- UNISIM by Honeywell (process simulation) based on previous use of Pro II and AspenPlus
- CONVAL (flow calculations, control valves and orifices)
- SulDry (arrangement of glycol gas dehydration facilities)
- In-house calculation tools for
  - heat exchangers, filters/separators and vents
  - pressure loss calculations
  - cavern thermodynamics, materials data and phase equilibria
  - two-phase flow etc.
- 2D planning with AutoCAD V 17
- 3D planning with Plant 3D
- P+I diagrams, process flow charts with AutoCAD PID
- Building(s), steel construction and receptacles with inventory
- Strength calculations with Dimy V 5, Rev. 12.3
- MS-Office, MS-Project
- Document management with in-house database on access basis
- Documentation of HAZOP meetings with in-house database on access basis

## Media used

- Natural gas, oil, other reservoir fluids
- Condensates, watery fluids
- Glycols
- Methanol
- Saturated brine (NaCl, MgCl<sub>2</sub>)
- Helium, CO<sub>2</sub>, hydrogen
- Fuels

# Surface engineering

## Projects

- Surface gas facilities for gas storage (in caverns, deposits and aquifers)
- Transition of gas storage facilities into remote operation
- Compression plants
- Gas dehydration plants (engineering and supply)
- Measurement and process units (gas pressure control and measuring stations)
- Flow lines (in compliance with the German BbergG laws, engineering and supply)
- Mains gas lines (in compliance with EnWG)
- Double wall systems (for condensates, glycol)
- Ejectors
- Gas optimisation plant and pipe storage
- Gas and leaching connections to the cavern well head/Christmas tree
- Leaching stations, leaching equipment
- Gas evacuation plants (engineering and supply)
- Flooding plants (engineering and supply)
- Metering units
- Pump containers (engineering and supply)
- Removal of stations

## Benefits

- Flexibility within the scope of the order (study, supplies, complete facilities)
- Understanding as service provider for, or as representatives of, the contracting client
  - Many years of experience, also in the supply of facility components
  - Many years of experience in the assessment of operation parameters
  - Experienced project teams and project managers
  - Many years of cooperation with subcontractors for special areas of planning (construction, EMSR etc.)
  - Comparable in-depth process knowledge, particularly from the preparation of our own calculation tools and many years of operational phase engineering support

# ● Drilling services



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# Drilling services

## General services

### Engineering planning

- Draft planning with rough cost estimate and schedule
- Specification of the technical equipment
- Work discussions and specialist meetings with service providers
- Technical/Commercial tender evaluations, preparation of contract awarding recommendations
- Checking confirmations of order
- Participation in negotiations with authorities
- Planning the organisation and dates for the entire project process
- Preparation of risk assessments
- Interface coordination of the service trades
- Project, safety and quality management (HSE)
- Engineering and realisation through deployment of Landmark®
  - Drill path planning including anti-collision analysis
  - Torque and drag calculation
  - Hydraulics calculations
  - Arrangement of the casing design
  - Cementation simulation including stand-off calculation
  - Real time reproduction of survey data
  - Independent comparison of logging with measurement-while-drilling data (azimuth and inclination)

### Work supervision

- Management of the tasks for carrying out the project on site and supervision in terms of compliance with the planned and agreed process as well as the generally recognised rules and relevant regulations that apply
- Technical support
- Managing documentation such as daily reports
- Carrying out construction site meetings and safety meetings
- Coordination of the service and supply companies involved in the realisation of the work
- Coordination with authorities, experts and authorised external plants
- Cost control and auditing (technical and commercial)
- Preparation of final documentation (incl. verifications and disposals)



# Drilling services

## Rig services

Wireline work and pressure equipment down to 3,000m, with 6m lubricator, hydraulic gland

- Long-term resting, flow and layer pressure measurement with digital depth pressure gauges
- Temperature profiles
- Level measurements
- Water, gas and solids samples
- Calliper logs, dummy runs
- Ensuring passability
- Shoe and artificial depth measurement
- Scrapers, swaging tools and sand dolls
- Fishing jobs, fishing spears and wire spears

Wireline cable and pressure equipment down to 2,500m, with 6m lubricator, preventer and hydraulic gland

- Online flow, pressure and temperature measurement

Groundwater monitoring, level controls

- Pressure and temperature monitoring
- Level measurement/cable electric contact gauge

Screwing work checked (up to 11  $\frac{3}{4}$ " )/made up by computer (up to 5  $\frac{1}{2}$ " )

- Checked making up of casing and tubing strings
- Drilling, production and evacuation strings
- MIT tubing types
- Running out and running in of tubes in the shaft
- Drilling equipment (horizontal tong)

Hydrostatic pressure work

- Drilling equipment (valves, tubes, pressure rods, standpipes and manifolds)
- Test equipment

Blowout prevention valve

- Setting of one and two-way valves in well heads



# Drilling services

## Rig services

### Test work

- Production test
- Performance test
- Function test
- Hydraulic and pneumatic MITs Casing string, shoe and head
- Hydraulic and pneumatic pressure tests
- Leak searches
- Data loggers, surface pressure measurements

### Maintenance work

- Repair/Overhaul of screw tongs, valves and testing heads
- Calibration of drillometers, measurement technology, manometers, traction gauges, pressure boxes and dynamometers
- Maintenance on well heads (sealing, greasing and colouring)
- Maintenance/Repair of high-pressure compressors
- Maintenance/Repair of maximisers/metering pumps

### Service work on drilling/workover equipment

- Structure and service for drillometers
- Measurement displays including for pressure, torque, strokes or revs
- Acceptance and calibration of process measurement and control equipment
- Preparation of adapted software applications for drilling process data capture

### Others

- Annulus level measurements
- Annulus level lowering
- Annulus level replenishment
- Cleaning up of wells
- Assistance with measurement work by external companies
- Provision of make up personnel
- Assembly work (flanges, preventers for drilling equipment)

# ● Drilling services

## Drilling and Workover

- Wells for salt caverns and pore storage
- Kicked off and horizontal drilling
- Exploration wells
- Exploratory wells
- Geothermal wells
- Completions, re-completions
- Repairs, pluggings
- Workover tasks (tubing extraction work, cavern space measurements, etc.)
- Testing and exploration work in selected geological strata
- Measurements of compressive strength
- Tightness tests
- Subsurface sampling, determining levels, monitoring
- Provision of safety supervision for drilling and workover equipment
- Ensuring construction supervision of drilling and workover equipment

### Reference Projects: > 500 wells in more than 50 years

- |                     |                |
|---------------------|----------------|
| - Exploratory wells | 2,000 – 4,800m |
| - Aquifer wells     | 400 – 700m     |
| - Production wells  | 1,000 – 1,100m |
| - Cavern wells      | 800 – 1,800m   |
| - Disposal wells    | 1,200m         |
| - Geothermal wells  | 1,500 – 4,300m |

# Drilling services

## Drilling and Workover

### The UGS drilling and workover rigs

RIG T 53  
Cabot Franks 200



- Hook load: 62 t
- Mast length: 21.95m
- Input power: 201 kW
- Rotary table: 300/2L
- Mud pump: JWS - 340L Triplex

RIG A 52  
Cabot Franks 500



- Hook load: 95 t
- Mast length: 31 m
- Input power: 257 kW
- Rotary table: SA 17 1/2"
- Mud pump: HD 500

RIG 104  
Wilson Mogul 42



- Hook load: 137 t
- Mast length: 29.26 m
- Input power: 206 kW
- Rotary table: MRL 275
- Mud pump: 3 PN - 700 Triplex



# Drilling services

## Drilling and Workover

### The UGS drilling and workover rigs

RIG T 10  
Cabot Franks 900



- Hook load: 165 t
- Mast length: 34.20 m
- Input power: 700 kW
- Rotary table: C 275
- Mud pump: F 1000 Triplex

RIG T 11  
Cabot Franks 650



- Hook load: 122 t
- Mast length: 31.00 m
- Input power: 375 kW
- Rotary table: 300/2L
- Mud pump: F 1000 Triplex

RIG T 12  
IRI Franks 900



- Hook load: 181 t
- Mast length: 34.20 m
- Input power: 662 kW
- Rotary table: LR 275 L
- Mud pump: F 1000

# Drilling services

## Drilling and Workover

### The UGS drilling and workover rigs

RIG T 20  
Crown Duke 1000



- Hook load: 200 t
- Mast length: 35.90 m
- Input power: 735 kW
- Top Drive: Tesco 250 HMI
- Rotary table: RK 275
- Mud pump: F 1000

There is a plentiful supply of other drilling equipment (tank systems, well safety equipment, drill strings, crossovers, drilling tools, flanges etc.) which is used as necessary for each deployment. The drilling and workover rigs can also be fitted out with different equipment to suit each requirement.

All our toolpushers are certified to the IWCF Level 4 standard. All our shift foremen are certified to the IWCF Level 3 standard. As a rule, the drilling teams are certified to the IWCF Level 2 standard.

There are at least two first aiders at the location on each shift and all our managers are SCC certified.

# Operation management



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# Operation management

## General services

Commissioning and operation of external facilities, such as

- equipment for leaching, brine processing and brine supply
- equipment for first gas injection into caverns
- equipment for flooding caverns
- complete surface equipment in commercial gas operation
  - as cavern storage
  - as pore/aquifer storage

Operation of external facilities at up to 250 bar for the following process media

- natural gas
- condensates
- helium
- nitrogen
- saturated/unsaturated brine
- drinking and process water
- diesel oil
- glycol, methanol

Operational management through carrying out services in

- process management
- maintenance
- dispatching
- management/administration, individually or in combination, for each external facility



# Operation management

## Process management

- Process management by authorised control room personnel, approved under mining law, in 24/7 systems
- Process management support by field personnel
- Supervision of surface and subsurface storage operation along with the carrying out of all operation and control activities to do with the system operation, such as
  - control/operation of technological equipment through different levels of operation, especially of start-up and shut-down processes of the whole facility, as well as any redundant subsystems
  - adjusting/altering the process parameters
  - realisation of effective modes of operation and carrying out of switching operations
  - supervision of all technical equipment through different levels of observation, particularly:
    - operating conditions of the equipment and subsystems as well as their interdependencies
    - approaches to limit values at remotely monitored measurement locations (pressure, temperature, quantity, filling level and gas quality)
    - set value deviations in facilities that are in operation
- Ensuring internal and external flows of information including communication with relevant authorities, taking on the function of a constantly occupied location or a central reporting point.
- Remote process management through our own control room in Mittenwalde



# Operation management

## Maintenance

- Planning of maintenance measures, e.g. for the annual plan, the scheduled and cyclical management of individual plant components, especially for those facilities that need to be monitored.
- Carrying out work permission/work approval processes
- Preparation of inertisation and fumigation plans
- Carrying out of commissioning and decommissioning including LOTO management
- Carrying out of last-minute risk analyses
- Carrying out of expert function checks, such as for checking the tightness of Christmas tree valves, gas pressure regulation equipment, liquid knock-outs etc.
- Carrying out of maintenance measures, e.g. on gas dehydration plants, for checking the tightness of containers and pipelines, function checks of flow controls and locks.
- Organisation of all special maintenance procedures that have to be carried out by special companies, such as fire alarm systems, gas heating equipment and all checks made by experts; involvement and coordination of experts in special cases
- Carrying out of maintenance and repair work, troubleshooting and rectification of faults as well as carrying out logistics, such as the operation of crane systems and mobile lifting appliances or work platforms
- Carrying out assessments of the condition of all technical machine and facility components
- Spare parts management (specification, procurement and checking of incoming goods)
- Warehousing (fuels, spare parts, administration of receipts and dispatches)
- Measurement and checking activities on wells and levels, such as ground-to-air measurements and tightness checks
- Carrying out of flow-line pigging
- Taking samples, analyses in a field laboratory
- Technological and technical safety facility signage and labelling

# ● Operation management

## Dispatching

- Provision of communicative connections for data exchange with the partners involved, such as FTP, EDIGAS V4.0 XML format or higher, AS2
- Priority use of the EIC coding with the partners involved, or use of other specific coding if necessary
- Recording of all technical availabilities at the facility and communication of any restrictions to retailers
- Recording of all incoming nominations
- Carrying out the matching process and adjustment of storage use with the FGL connections
- Preparation of daily running schedules, overall, for each connection point and for each storage user
- Carrying out the allocation and the accounting
- Preparation of user-specific reports, such as daily settlement, monthly reviews, utilisation charts etc. at agreed times / in agreed cycles
- Carrying out in 24/7 systems, either centrally or locally

# Operation management

## Management/Administration

- Taking on organisational responsibility as well as technologically and organisationally capable supervision of the external facility in compliance with German mining law
- Preparation of inspection reports
- Preparation of health and safety documents specific for each project, including emergency management
- Initial preparation and updating of hazard assessments including assignment of checklists and checkers of facility components and tools
- Preparation of work permissions/work approval processes
- Preparation of specific instruction plans for each facility
- Preparation and management of specific operation documentation for the given project
- Ensuring that the demands of legally valid documentation are met
- Problem tracking and warranty management
- Procedural and energy-related process optimisation
- Carrying out of waste and disposal management in an electronic verification procedure
- Carrying out the management of hazardous substances

## Software

- Provision of modular constructed, adaptable operation management software with diverse links (with its own database development, web-based)
- Use of software provided such as SAP R3, Cavbase and Nomix

## Contact people

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