

CavBase GasStorage

Version 2.0

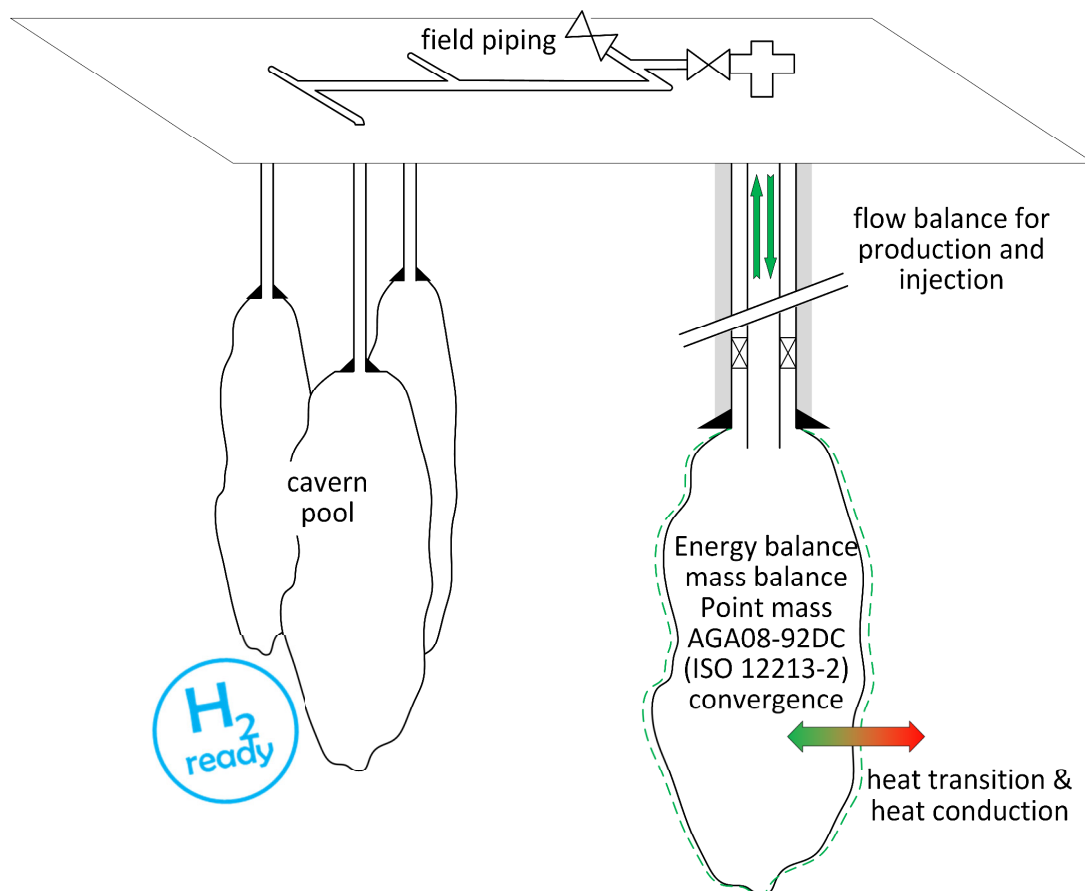


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An always available and accurate simulation program represents an essential basis for the effective operation of a cavern storage facility, as it enables the operator to investigate and evaluate the effects of different storage operations. The CavBase GasStorage (CBGS) program was developed in the mid-1990s and has continued to be developed in a modular fashion to enable such calculations.

It has so far been installed at 17 gas storage facilities on a decentralized basis and is currently used by some of the largest German storage operators, who regularly use it to perform simulations for more than 130 natural gas storage caverns.

The program consists of a basic program that can be extended by a number of modules.



Calculation model of CavBase GasStorage for a single cavern as well as for a cavern pool operated in parallel.

Simulation Model (Basic Program)

- Automatic integration and validation of operating data, generation of daily reports and error logs
- Tracking of wellhead pressures or volume rates
- Polytropic pressure, temperature and gas volume calculations with AGA08 (ISO 12213-2)
- Flexibility in gas composition, including hydrogen mixtures or pure hydrogen
- Calculation of heat flow between rock salt and gas inside the cavern
- Pressure losses in the production tubing and in the surface piping system

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Additional Modules

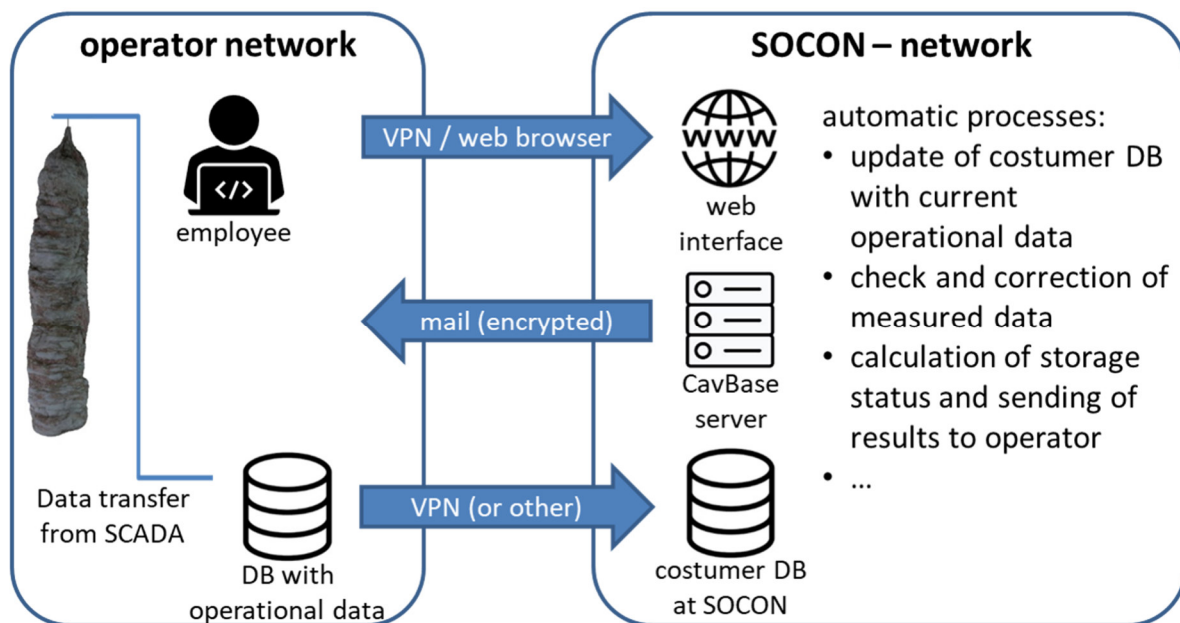
- Pool operation of caverns with different pressures, volumes, depth, etc.
- Continuous, pressure-dependent convergence calculation
- Hydrate module including calculation of required inhibitor quantities
- CavBox module (gas first filling, storage operation can also be simulated with partially filled cavern)
- Integration of the surface facilities up to the transport pipeline

New Structure as Cloud-Service

In the new version, CBGS is available as a web-based service. For this purpose, a dedicated and secured server was set up and the calculation program was updated. As shown in the figure below, the operating data is transferred to this server. The operator's employees access the server via a secure connection and operate it via web interface. This avoids data access to the storage operator's network.

The newly designed user interface of the program allows a simplified and thus easy use.

The new structure of the program means that CavBase GasStorage can now be deployed as a software license, so that together with the modular structure it can now also be better adapted for use by smaller storage operators.



Integration of the CavBase GasStorage simulation program as a web-based service