

The background of the entire page is a photograph of two oil pumpjacks in silhouette against a bright, orange-hued sunset sky with scattered clouds. The pumpjacks are positioned in the center and right of the frame, with their long walking beams and counterweights clearly visible. The overall mood is industrial yet serene due to the natural lighting.

SIEMENS

Extending value through field redevelopment

Solutions that maximize the value of mature assets

Compression & Solutions

www.siemens.com/oilgas

The real alternative: Field redevelopment solutions

As well pressure declines, oil and gas producers face decreasing production and high OPEX, and eventually have to abandon their field. In this scenario, Siemens' field development solutions offer a real alternative. These solutions address the most important challenges operators face every day:

- Decreased production
- Unpredictable production
- Manpower-intensive production
- Health, safety, and environmental risks
- Theft of equipment and product

Siemens' field redevelopment solutions use innovative technology that enables operators to boost production and at the same time reduce production costs. With field redevelopment, they can extend the life cycle of a field and improve production of valuable and scarce hydrocarbons. This helps to meet overall production targets, and postpone the cost of field abandonment.

Produce more, spend less

Siemens redevelopment solutions are fully integrated platforms with a high level of automation to save labor costs on your site. At the same time, our solutions immediately increase production and allow you to meet long-term supply obligations.

Additionally, our remote-controlled operation enables higher security and raises safety to a higher level.

Because Siemens' solutions can be delivered as pre-assembled containers and skids, they can be easily shipped and installed. You can also reuse the solution elsewhere when a site reaches the final end of its life. This enables amortization of equipment over several assets and includes all associated services and technologies needed for a complete solution.



Different challenges – the right technologies

Mobile wellhead compression

As a well's gas pressure declines, the gas velocity often is not enough to transport produced liquids upward through the production tubing. This is commonly referred to as "liquid loading." By compressing the gas near the wellhead, the wellhead pressure is decreased, which increases the production rate and prevents liquid loading. Using a wellhead compressor can substantially extend the service life of your wells.

Depending on reservoir and well characteristics, a gas well with a depletion compressor can continue to produce gas for up to 10 years more. With that life span in mind, we developed our mobile field redevelopment solution so that it can be reused at a second or even third production site. To make disconnection, transportation and reinstallation as easy as possible, we integrate all functions into a skid-mounted assembly that provides easy access to all required interfaces.



Dirty gas compression

As natural gas wells enter their final production phase, declining pressure creates problems such as low production rate, unstable production, liquid loading, poor pressure entry at the gas treatment facility, and pressure differences between wells.

Siemens' depletion compression solutions provide the necessary pressure for gas processing and delivery. The key component of Siemens' solution for dirty gas compression is the unique STC-ECO, a hermetically sealed, integrated motor compressor suitable for onshore, offshore, and even subsea

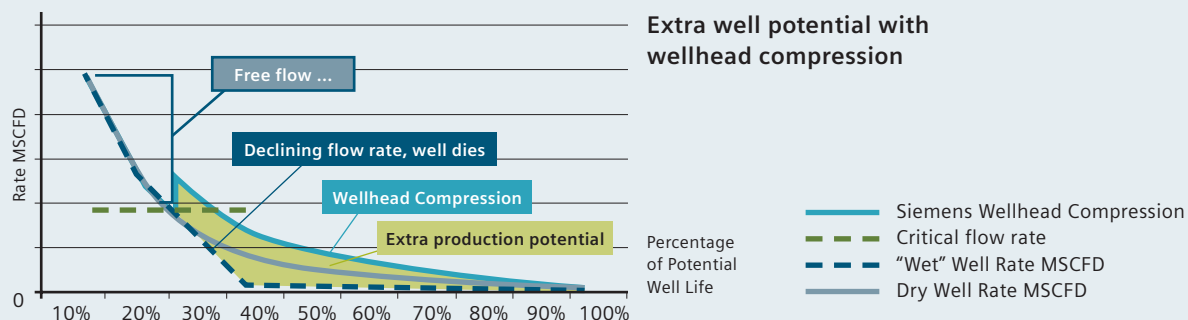


Seawater injection systems

Injection of seawater or re-injection of produced water improves recoverable reserves from a reservoir by establishing an external water drive and maintaining reservoir pressure. This process may even double recoverable reserves. Whatever the injection or re-injection needs, Siemens has the experience and technologies to meet the water quality requirements, enhance oil production, and protect the reservoir.

Other solutions may include the use of

- Electrochlorination
- Filters for Particle Removal
- Fine filtration
- Deaerators
- Membranes Sulphate Removal
- Membranes for (partial) Desalination
- Chemical injection
- Feed & Main Injection Pumps



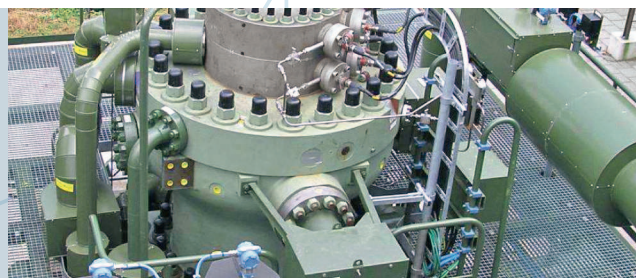
Mobile wellhead controller

Siemens' mobile production package is an autonomous unit combining simple safety, control and measurement functionalities on one skid. It operates with minimal facilities, reducing project lead time and construction costs, requires fewer people on-site during construction and installation, and speeds production after well completion – substantially reducing your costs.

Containerized Siemens electrical and instrumentation solution for reciprocating compressors

This integrated solution leverages Siemens' electrical and instrumentation competence to minimize interface risks. The container includes a variable-speed drive solution; control, safeguarding, and telecommunication systems; and medium-voltage and low-voltage systems.

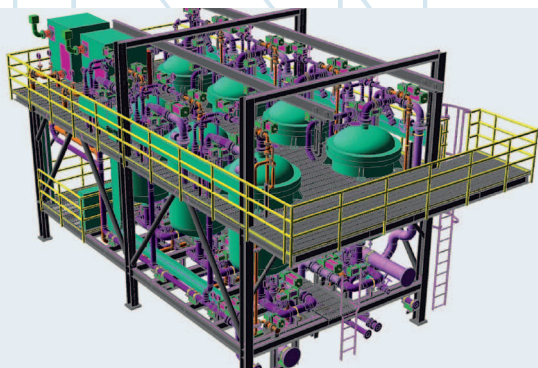
applications. Its innovative design meets the challenges of upstream dirty gas compression and other demanding applications, which have traditionally been hampered by poor seal reliability.



Mobile water treatment and injection

Siemens has developed a unique process that allows waste fluids (such as pit water, produced water, and frac flowback fluids) to be reused for subsequent frac jobs as a dust suppressant, for initial surface-hole

drilling operations, and for agricultural irrigation. The process includes customized water treatment for any of these reuses – all of which have been tested in our laboratories and proven in field applications.



Integrated solutions from a trusted technology partner

Vertical integration

More than just equipment

Because of Siemens' long-standing relationships with oil and gas producers, we understand the operator's need for complete, single-source solutions. Our solutions are fully integrated and include consultant services, risk management, full project engineering, project management, site preparation, installation, commissioning, and whatever is required for optimum hydro carbon production.

Horizontal integration

Multiple disciplines and technologies

As a worldwide technology leader, Siemens offers customers a broad range of solutions. These include systems and capabilities such as:

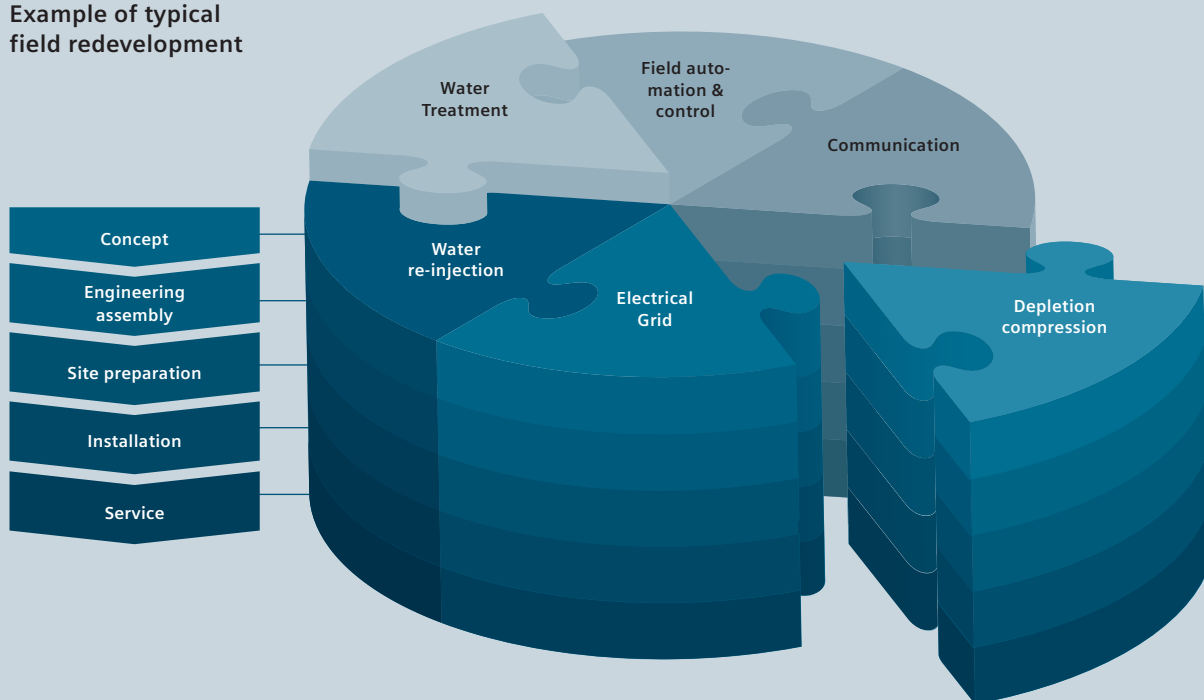
- Instrumentation and control
- Power distribution and transmission
- Power and steam generation
- Pumping and compressor stations
- Electrical, instrumentation, and control for pipelines
- SCADA and enterprise intelligence systems for complete plant management

Integrated concepts

When implementing new field redevelopment equipment operators may also need to upgrade related systems such as electrical grid or communication system. Siemens has multidisciplinary experience to do that. Siemens field

development solutions can be tailored to the specific requirements of entire site. We integrate all the components required for automated, unmanned operation, maximizing the value of mature fields.

Example of typical field redevelopment



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Oil & Gas Division
Order No. E50001-G440-A179-X-4A00 |
Printed in The Netherlands |
Dispo 21614 | c4bs No. 7807 |
TH 104-120505 | 000000 | WS | 06122.0

Printed on elementary chlorine-free bleached paper.

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