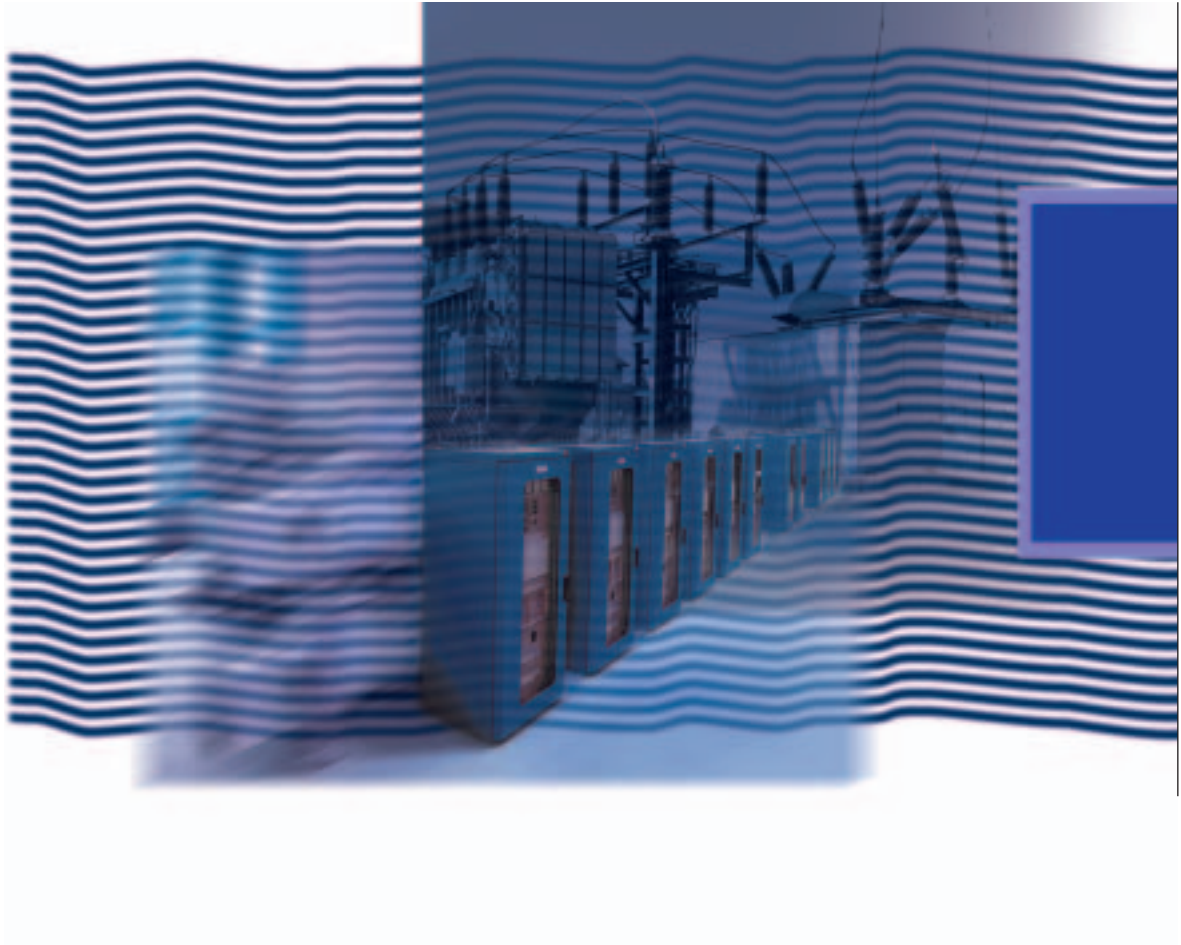


# The Substation Concept PS-1

Function · Time · Costs





## The markets for electrical energy are changing all over the world ...

Competition for the producers and suppliers of electrical energy has been increasing continuously over the past years. This development can be attributed to the growing world-wide liberalization of the markets for electrical energy. To achieve long-term success in these keenly contested markets it is vital to be able to adapt to new demands.



The main requirements on technical systems such as substations are more and more governed by economic factors. Therefore, when evaluating substations with identical functionality, investment and operating costs become more significant than technical characteristics.

As a global supplier of turnkey substations with many years of experience we have developed a modern substation concept for up to 145 kV to suit the current market situation: PS-1

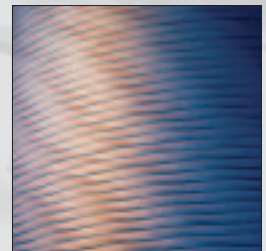
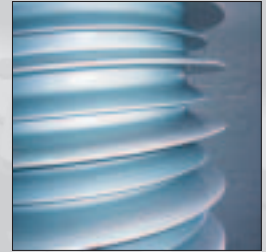
**Function · Time · Costs**

## New demands require a new design – PS-1

### Function · Time · Costs

The development of PS-1 was centered around the needs for the entire substation system. All components were selected and optimized in view of the functionality of the whole system.

The complete process was analyzed, starting with engineering and production up to the operation of substations. It was on this basis that we developed an optimized process which especially takes into account the typical processes on the operator's side. We have reached our goal to considerably reduce the time required to set up a substation project.

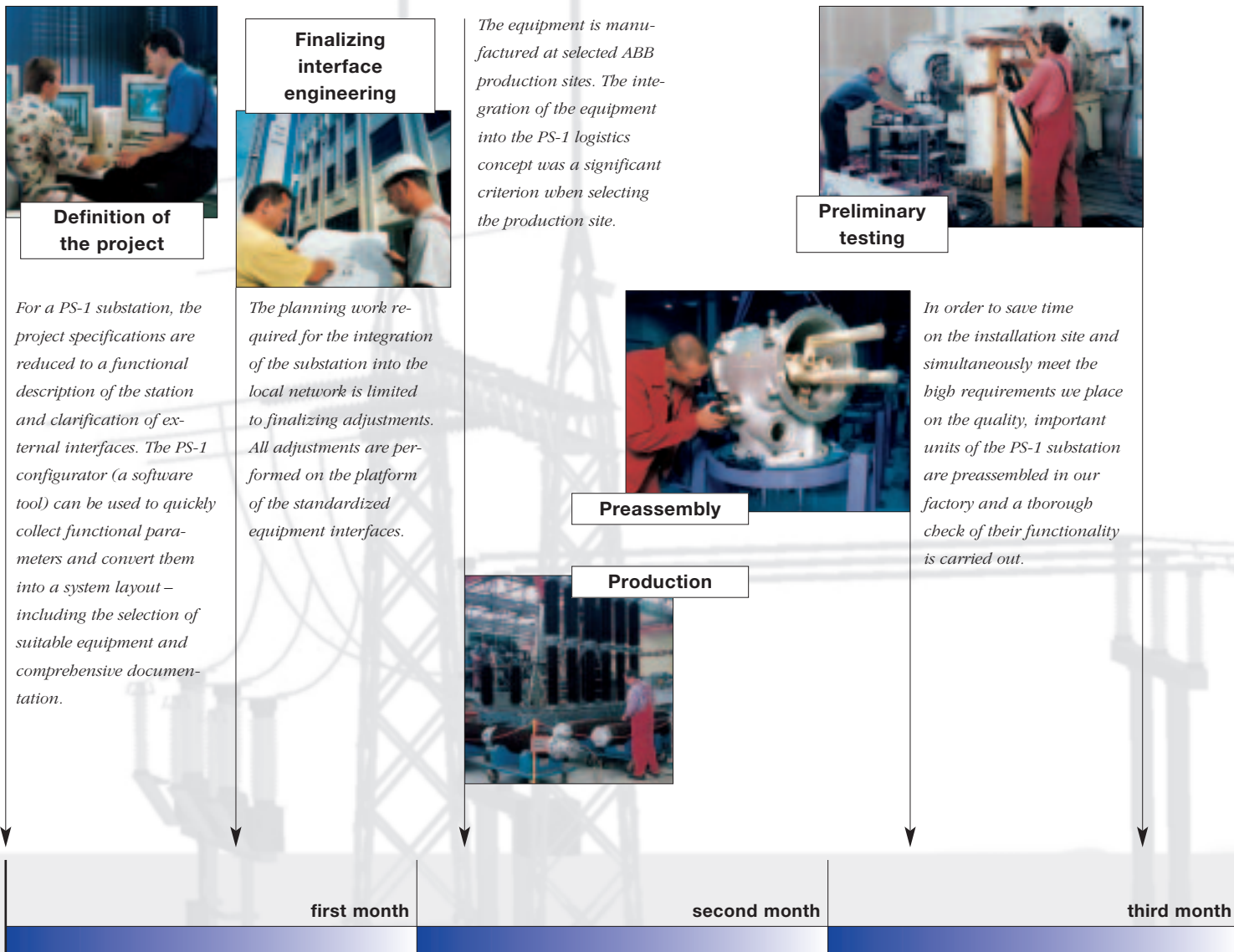


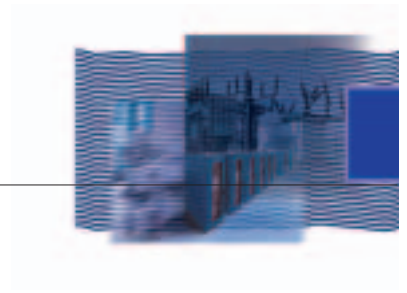
PS-1 focuses on function, time and costs. This was achieved by consistently standardizing the entire substation.

**Processes can be accelerated ...  
... if you take the whole thing into account**

With PS-1 it was our ambitious objective to produce a substation concept which could cut in half the delivery time required for other typical turnkey substations. In order

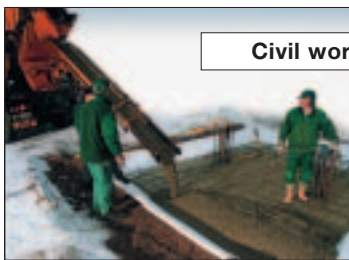
to achieve this we analyzed the individual stages of the process and clearly defined all interfaces with suppliers and the future operator of the substation. All stages of the process, material flows and transport paths were redefined and standardized with a





view to optimizing the entire process. This resulted in a modern logistics concept. It is also important to mention that, due to the process optimization, the planning and supervising efforts could also be minimized on the part of the operator.

## Function · Time · Costs



**Civil works**

*Thanks to the equipment selected in the course of the PS-1 standardization and to a unified concept – e.g. for the concrete foundation – the time required for the necessary civil works could be reduced considerably. Within this standardized concept, no adjustments or corrections are necessary.*



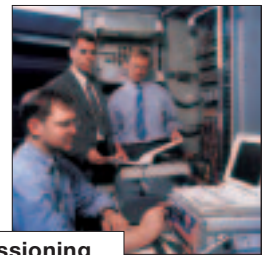
**Transport**



*In the PS-1 logistics concept all components required are transported together and delivered to the installation site on time. This ensures a smooth set-up process.*

*Due to preassembly in the factory the time required on the installation site has been reduced significantly compared to traditional projects.*

**Installation**



**Commissioning**

*The complete standardization of the substation has enabled a uniform commissioning process and reduces accompanying expenditure. The preliminary testing carried out at the factory makes a valuable contribution to accelerating the commissioning process.*

fourth month

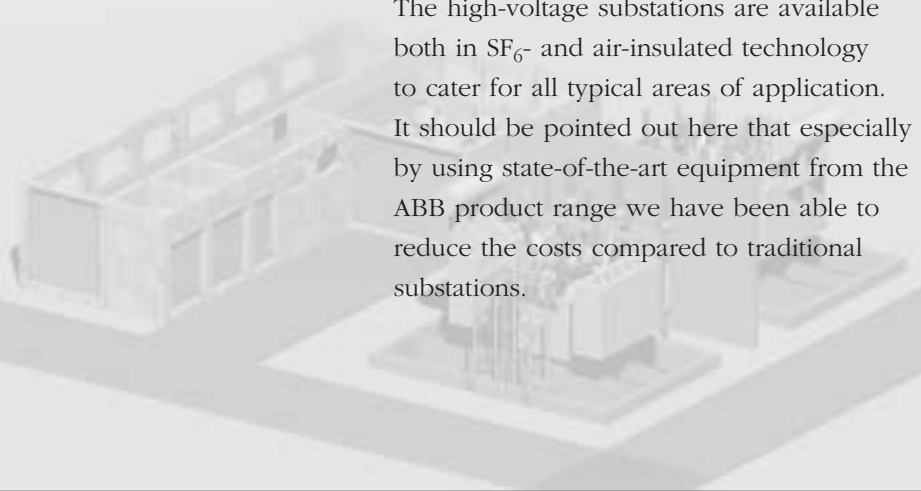
fifth month

sixth month



## Concentrating on functionality requires modern technology ...

The high-voltage substations are available both in SF<sub>6</sub>- and air-insulated technology to cater for all typical areas of application. It should be pointed out here that especially by using state-of-the-art equipment from the ABB product range we have been able to reduce the costs compared to traditional substations.

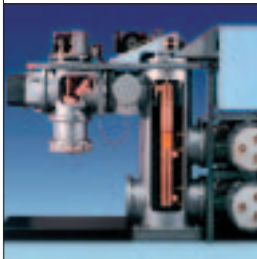


**Disconnecting  
circuit-breaker**



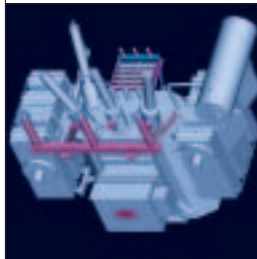
*Our innovative high-voltage switchgear combines insulating and switching functions. As in the SF<sub>6</sub>-insulated substations, the position of the disconnecting device is clearly indicated.*

**Compact GIS  
switchgear**



*Thanks to the compact design of SF<sub>6</sub>-insulated high-voltage switchgear the space requirements for the substations using this solution can be reduced to a minimum. The effects of all external factors can be practically ruled out.*

**Optimized transformers**



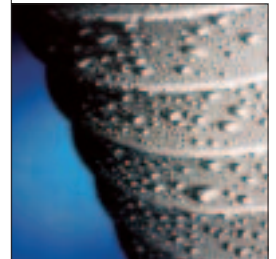
*PS-1 is the first integrated concept to encompass extensive standardization of the power transformers. This contributes to higher quality in the same way as standardization of other parts.*

**Intelligent medium-  
voltage switchgear**



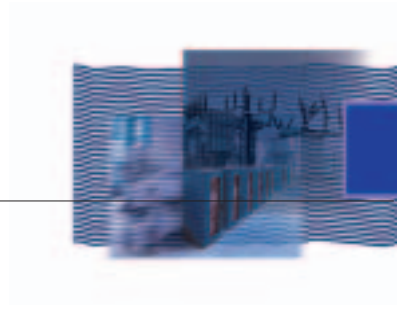
*The medium voltage switchgear in the PS-1 substations is equipped with modern bay computers. They are used for safety, control, measuring and unified communication functions. In addition, all cubicles have active safety elements such as an arc fault protection device.*

**Polymer insulators**

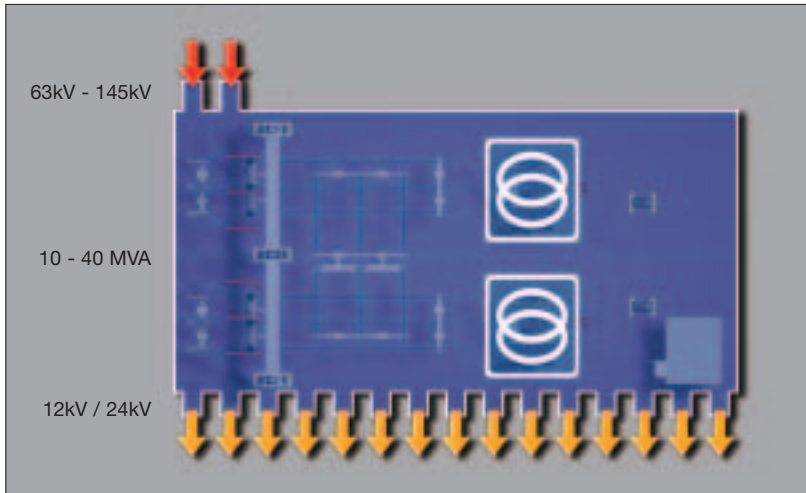


*The consistent use of polymer high voltage insulators within the PS-1 concept demonstrates our commitment to modern material technology. Low sensitivity to pollution is just one of the special material-specific characteristics.*

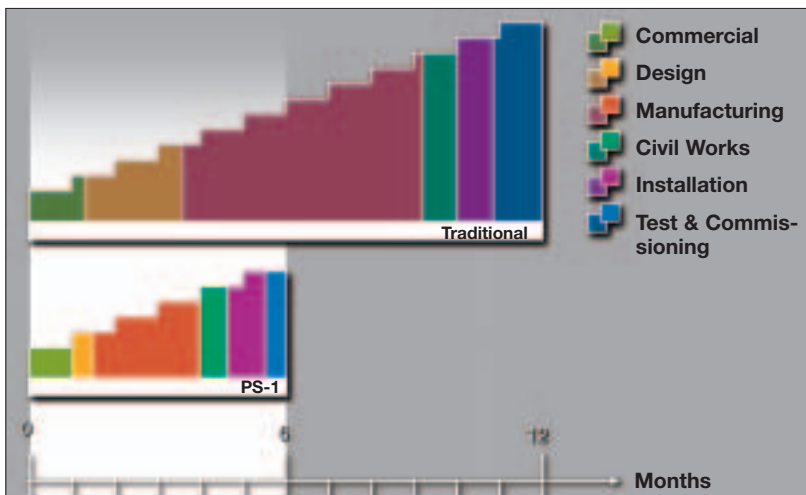
**Function · Time · Costs**



**There are good reasons  
for choosing a PS-1 substation ...**



We guarantee the same reliable functionality for the PS-1 substations as for our traditional system solutions. The functionality of a PS-1 substation is equal to a typical distribution station with up to two connected high voltage lines, a maximum of two power transformers and up to twenty medium voltage outputs.



Due to the complete standardization of all process steps and the entire equipment, a PS-1 substation project can usually be completed in half the time required for a comparable traditional project.



The PS-1 substation offers a turnkey solution with unmatched world-wide references. The concept is used at oil fields in the deserts of Kazakhstan, windfarms at the North Sea coast and by the forest industry in Finland or utilities in America. Thus, PS-1 withstands a broad range of climatic conditions and conforms with both ANSI and IEC-standards as well as tough national requirements from utilities and the private industry.