PCS-9569

Shore Power System

Shore power system enables vessels to shut down their auxiliary engines and use shoreside electricity power supply while at berth. Auxiliary diesel engines run by vessels consume lots of fuel and produce a large quantity of pollutants, including polluting emissions, noise and vibration. Shore power helps to reduce energy waste and costs and to improve the environment in port.

The PCS-9569 shore power system of NR Electric enables the shore-to-ship power connection. It helps to adjust de the grid electricity to appropriate vessel frequency so as to enable the reliable and high-quality 50 and 60Hz power supply regardless of the local port grid frequency.

Variable Frequency Power Supply

Since vessels may need both 50Hz and 60Hz electricity, whereas local grid may not be able to supply, frequency conversion is necessary. The AC-DC converters are the core of power supply. Besides, other auxiliary equipments, such as transformer and circuit breaker cabinet, are necessary.

There are two types of variable frequency power supplies in the PCS-9569 shore power system:

- Low-voltage PCS-9569L
  Max. 1MVA ;

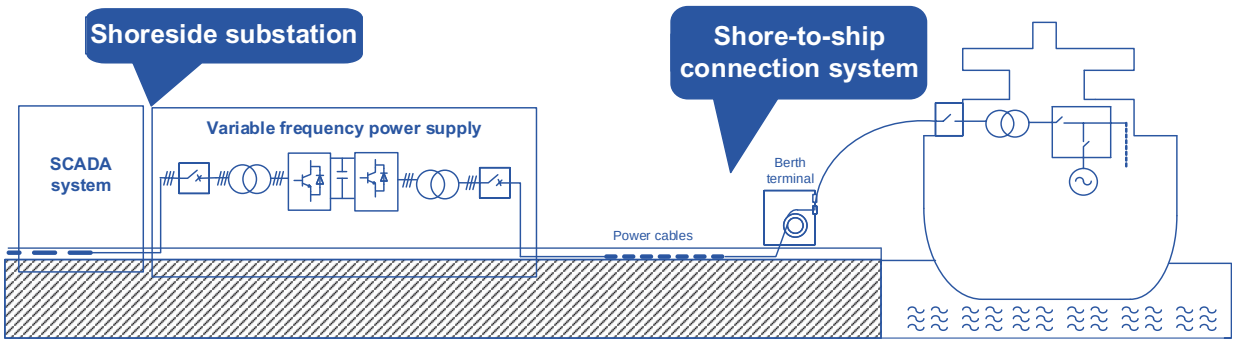

Figure 1 PCS-9569 Shore Power System

Modular design and structure topology in parallel ;
Three-phase controllable AC-DC converter for each module.

- High-voltage PCS-9569H
  2~20MVA ;
  Modular design and structure topology in serial.

SCADA System

Based on the NR Electric's well-proven substation SCADA system, we follow the power dispatching principles and fuse them with the characteristics of shore power system to create the PCS-9700 SCADA system. It provides full monitoring and control functions for frequency converter, transformer, CB cabinet, environment monitoring, etc. it also provides an human-machine interface for rich information with powerful analyze ability and completed alert mechanism.

Shore-to-ship Connection System

The shore-to-ship connection system is laid out along the rail on dock with berth terminal containing connection plugs. the safety interlock mechanism makes sure the shut down of shore power system if there is a disconnection of power cable, an urgent stop command or an unplugging.

The cable reel installation is optional to automatically draw in/out cables depending on the tide level or the draft line. Cable can be released flexibly from reel without exceeding its maximum permissible tensile force.

Features

- Modular design
  System standard modular design for convenient maintenance and replacement ;
  Structure topology in serial or in parallel to realize different power supply capacity.

- Power module redundancy
  Redundancy and fault isolation functions for power module to isolate fault on and bypass single module, to avoid influence on other modules and to realize system continuous operation.

- Rugged dock environment adaptability
  High temperature, low temperature, humidity, salt fog, dust, vibration, etc.

- Advanced control ability
  Automatic voltage and frequency stabilizing ;
  Vector control strategy with high precision ;
  Stabilization : voltage < 5%, frequency < 0.1%.

- Load transfer
  After the synchronization of vessel auxiliary engines and the shoreside power supply, use frequency droop function to realize load transfer without power outage during the shore-to-ship connection.