

A stable and reliable power supply is a pre-requisite for efficient operation of any industrial plant; in particular for energy-intensive systems, where an unscheduled trip could result in several days of lost production (typical for offshore oil & gas facilities). Proper management and control of the available power sources and consumers is crucial. This applies to grid connected systems as well as to island systems where public electricity supply is not available.

Efficient energy management is becoming increasingly important with the growing environmental consciousness and more stringent statutory regulations.

One main objective for the power management and distribution control system is to balance the continuously changing power demand with the available power from the producers/sources, thus avoiding disturbances or even black-outs. A sudden and unexpected loss or degrading of a power source requires rapid disconnection of the corresponding amount of load in a prioritized manner.

A power management and distribution control system may typically include the following functionality;

- Management of power sources/transmissions
 - ◇ Generator control (incl. governor and AVR mode selection, P/Q capability management etc.)
 - ◇ Active and re-active power control of inter-connected/grid-connected systems (incl. network determination and central mode management)
- Transformer management
 - ◇ On-load tap changer control and mode selection
- Load Shedding
 - ◇ Fast, overload and under frequency load shedding
 - ◇ Spinning reserve calculations and start inhibit of large power consumers
- Control of power distribution system
 - ◇ Circuit breaker monitoring and control
 - ◇ Make Before Break (MBB) functionality

The required functionality of the power management system is typically defined by use of System Control Diagrams (SCD).

A full integration of the power management and distribution control system into the overall control system portfolio for the subject asset is becoming more and more the standard solution. Such a solution may provide a number of benefits to the end user;

- Consistent operator environment/HMI pictures
- Increased efficiency and higher reliability
- Digitalized interface communication protocols
- Standardized alarm/event handling and diagnostics



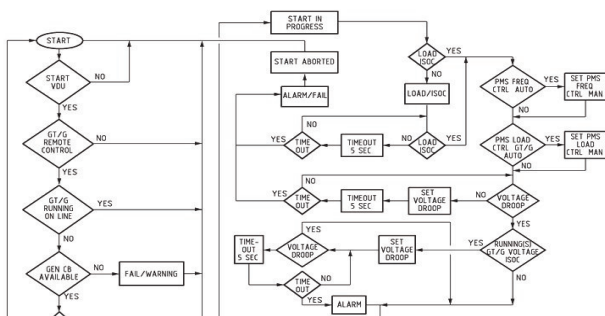
Valhall PH platform

A well designed functional power management systems is carefully coordinated with the electrical protection relay settings. Unitech Power Systems' engineers are competent and knowledgeable about power management systems as well as protection device coordination and electrical system design and analysis.

Contact us for more information and to discuss how we can serve your needs.

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Extract of typical SCD

Technology and application areas

PMS/PDCS

- Power source management
- Transmissions and grid connections
- Consumer control

Design spec./SCD

- Functional requirements and philosophies
- Design specification
- Logic diagrams

Test & follow-up

- Factory Acceptance Test
- Site Acceptance Test
- Commissioning support

ESD interfaces/ shutdown systems

- Ignition source control
- Manual electrical isolation

Selected project references

Year: 2012 - 2015

Customer: ConocoPhillips

Greater Ekofisk Area (GEA) power system

Establish simulation models to support GEA PMS development and parameter selection. Modification of governor and AVR/excitation simulation models to adapt to the new PMS interface control signals.

Technical support during implementation of new power transmission between the Ekofisk and Eldfisk facilities. Coordination of voltage and frequency protection settings versus PMS parameterization and functionality. Interaction/follow-up of PMS suppliers, including testing and commissioning assistance. Development of operational strategy for the PMS.

ELHAZ review of PMS functionality and associated technical documentation.

Year: 2011

Customer: Marathon

Alvheim

Investigations related to the load shedding system functionality.

Year: 2007 - 2009

Customer: BP

Ula

Preparation of strategy for, and provision of technical support during implementation of, a new PMS system for the Ula facilities.

Year: 2011 - 2013

Customer: Talisman

Gyda

PMS reviews, simulations/tuning of parameters, on-site measurements, verification of alarm system, establish PMS-related electrical protection relay settings, assistance during preparation of training programmes and operator manuals.

Year: 2002

Customer: Exxon

Ringhorne

Establishment of PMS philosophy. Preparation of logic diagrams/SCD's. Follow-up of system supplier during programming and testing. Preparation of operator training seminar.