primary winding is electrically connected to input terminals which arranged to be connected to the remote, high voltage power supply. The secondary windings are electrically connected to output terminals which are further arranged to be connected to the subsea power consuming devices.

A disadvantage of such an arrangement is that the secondary transformer windings have no protection against a failure in one of the circuits connected to a secondary winding, e.g. a ground fault, an overload or a short circuit in one of the subsea power consuming devices.

Such a failure may therefore result in the shutdown or disconnection of the entire transformer. This has substantial operational consequences, e.g. loss of operational time and costs, and should be avoided when possible.

SUMMARY

Disadvantages and/or shortcomings of background art have been overcome by a device and a system as have been set forth in the appended claims.

In particular, in a first aspect of the present invention, there is provided a subsea AC power distribution device, comprising a watertight housing accommodating at least one transformer, the transformer having a primary winding and a plurality of secondary windings; input terminals, electrically connected to the primary winding and arranged to be connected to a remote AC power supply; output terminals, electrically connected to the secondary windings and arranged to be connected to subsea power consuming devices; switches arranged to break the connections between each secondary winding and a corresponding output terminal, the switches being arranged within the watertight housing. Each switch includes a switch actuator and the watertight housing is configured with a first compartment and a second compartment separate from the first compartment, the transformer being arranged within the first compartment and the switches being arranged in the second compartment.

In a second aspect of the present invention, there is provided an AC subsea power distribution system, comprising a remote AC power supply, a subsea AC power

distribution device according to the first aspect, a plurality of subsea power consuming devices, and primary electrical connections which interconnect the remote power supply and the input terminals of the subsea power distribution device, and secondary electrical connections which interconnect the output terminals of the subsea power distribution device and the subsea power consuming devices.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be discussed in closer detail in the following with reference to the drawings, wherein

Figure 1 is a schematic block diagram illustrating aspects of a subsea power distribution device.

Figure 2 is a schematic block diagram illustrating certain further aspects of a subsea power distribution device.

Figure 3 is a schematic block diagram illustrating certain further aspects of a subsea power distribution device.

DETAILED DESCRIPTION

Figure 1 is a schematic block diagram illustrating aspects of a subsea power distribution device.

CLAIMS

1. Subsea AC power distribution device, comprising

a watertight housing accommodating at least one transformer, the transformer having a primary winding and a plurality of secondary windings;

input terminals, electrically connected to the primary winding and arranged to be connected to a remote AC power supply;

output terminals, electrically connected to the secondary windings and arranged to be connected to subsea power consuming devices;

switches arranged to break the connections between each secondary winding and a corresponding output terminal, the switches being arranged within the watertight housing, wherein each switch includes a switch actuator and the watertight housing is configured with a first compartment and a second compartment separate from the first compartment, the transformer being arranged within the first compartment and the switches being arranged in the second compartment.

2. Subsea AC power distribution device according to claim 1, wherein each secondary winding is provided with a corresponding switch.

3. Subsea AC power distribution device according to claim 1 or 2, wherein the first compartment and the second compartment are oil-filled.

4. Subsea AC power distribution device according to claim 3, wherein the switch actuator is contained within the watertight housing.

5. Subsea AC power distribution device according to claim 4, wherein the switch actuator is contained within the second compartment.

6. Subsea AC power distribution device according to claim 7, wherein the switch actuator is arranged external to the watertight housing.

7. Subsea AC power distribution device according to claim 6, wherein the switch actuator actuates the switch by means of a mechanical shaft extending through a portion of the watertight housing.

8. Subsea AC power distribution device according to claim 6, wherein the switch actuator actuates the switch by means of a magnetic coupling over a portion of the watertight housing.

9. Subsea AC power distribution device according to any one of the preceding claims, wherein the switch actuator is connected to and arranged to be controlled by a control unit which is arranged separately from the watertight housing.

10. Subsea AC power distribution device according to any one of the preceding claims, wherein the switch actuator is an electrical switch actuator.

11. Subsea AC power distribution device according to any one of the preceding claims, wherein the switch actuator is a hydraulic switch actuator.

12. Subsea AC power distribution device according to any one of the preceding claims, wherein each power consuming subsea device comprises a further power switch in a separate switch unit attached to or included in the same housing as the corresponding power consuming subsea device.

13. AC Subsea power distribution system, comprising
a remote AC power supply,
a subsea AC power distribution device according to one of the claims 1-12,
a plurality of subsea power consuming devices, and
primary electrical connections which interconnect the remote power supply and the input terminals of the subsea power distribution device, and
secondary electrical connections which interconnect the output terminals of the subsea power distribution device and the subsea power consuming devices.