CLAIMS

1. A method of testing a control system including communications,

control signal routing, wiring and a valve which is operable by a solenoid, the method comprising:

sending a command message from a command module to a single board computer (SBC), the command message comprising a test tag instructing the SBC to apply a pulse of current through a coil of the solenoid, the pulse of current being insufficient to cause the solenoid to operate the valve, wherein the valve is a subsea directional control valve of a subsea fluid extraction well having a topside control location and the application of said pulse of current through the coil is caused from the topside control location of the fluid extraction well; and

monitoring a response of the system to the pulse of current, wherein monitoring the response comprises comparing the response to a predetermined value to detect whether the control signal routing is functioning properly, wherein operation of the valve is normally controlled from the topside location via a communication route including the control signal route, and during testing, the step of applying a pulse of current through the coil takes place via the same communication route.

2. A method according to claim 1, wherein the response is monitored by monitoring current in the system.

3. A method according to claim 2, wherein the response is monitored by monitoring current through the coil.

4. A method according to claim 1, wherein the response is monitored by monitoring voltage across the coil.

5. A method according to claim 1, wherein a result of monitoring the response is compared with at least one expected result.

6. A method according to claim 5, wherein a result of the comparison is sent to the topside location.

7. A method according to claim 5, wherein an indication of the result of monitoring is sent to the topside location.

8. A control system including communications, control signal routing, wiring and a valve which is operable by a solenoid, the system comprising:

a power control configured to send a command message from a command module to a single board computer (SBC), the command message comprising a test tag instructing the SBC to apply a pulse of current through a coil of the solenoid, the current being insufficient to cause the solenoid to operate the valve, wherein the valve is a subsea directional control valve of a subsea fluid extraction well having a topside control location and the application of said pulse of current through the coil is caused from the topside control location of the fluid extraction well; and

a monitoring arrangement configured to monitor a response of the system to the pulse of current, wherein monitoring the response comprises comparing the response to a predetermined value to detect whether the control signal routing is functioning properly, wherein operation of the valve is normally controlled from the topside location via a communication route including the control signal routing, and during testing, the step of applying a pulse of current through the coil takes place via the same communication route.

9. The system according to claim 8, wherein the monitoring arrangement is adapted for monitoring current in the system.

10. The system according to claim 9, wherein the monitoring arrangement is adapted for monitoring current through the coil.

11. The system according to claim 8, wherein the monitoring arrangement is adapted for monitoring voltage across the coil.

12. The system according to claim 8, further comprising means for comparing a result of monitoring the response with at least one expected result.

13. The system according to claim 12, wherein said comparing means is located subsea.

14. The system according to claim 13, further comprising means for sending a result of the comparison to the topside location.

15. The system according to claim 8, further comprising means for sending an indication of the result of monitoring to the topside location.

16. The method according to claim 1, wherein monitoring the response of the system comprises sensing current at a position immediately before the coil using a Hall effect device.

17. A method according to claim 1, wherein the pulse of current applied through the coil of the solenoid is turned off before the valve starts operating.

18. The system according to claim 8, wherein the pulse of current applied through the coil of the solenoid is turned off before the valve starts operating.

19. A method according to claim 1, wherein the pulse of current applied through the coil of the solenoid is applied for a time duration in range of 10-20 milliseconds.

20. The system according to claim 8, wherein the pulse of current applied through the coil of the solenoid is applied for a time duration in range of 10-20 milliseconds.