CLAIMS:

1. A production control system for an underwater well, comprising:

first electrically operated means for supplying first hydraulic fluid, for opening a first control valve of the well;

second electrically operated means, for supplying second hydraulic fluid at a higher pressure than said first fluid, for opening a further control valve of the well;

electronic circuitry for providing electrical power for operating said first and second means; and

means for controlling the sequence of closing said control valves as a result of a loss of electrical power from said electronic circuitry, said controlling means comprising:

electrical power storage means;

detection means responsive to said loss of power from said electronic circuitry; and

means coupled with said detection means for using electrical power from said storage means to keep said further control valve open for a period after closure of said first control valve and close it after said period.

2. A system according to claim 1, wherein said electrical power storage means is charged by electrical power from said electronic circuitry.

3. A system according to claim 1 or 2, wherein said electronic circuitry comprises at least one subsea electronics module in a subsea control module at a tree of the well.

4. A system according to claim 3, wherein said storage means and said means coupled with said detection means are in said subsea control module.

5. A system according to any preceding claim, wherein said first electrically operated means comprises a first directional control valve and said second electrically operated means comprises a second directional control valve.

6. A system according to any preceding claim, wherein said detection means comprises means responsive to the pressure of hydraulic fluid supplied from said first electrically operated means.

7. A system according to any preceding claim, wherein said first control valve comprises a production fluid control valve.

8. A system according to any preceding claim, wherein said further control valve comprises a surface controlled sub-surface safety valve.

9. A system according to any preceding claim wherein, in response to closure of said first control valve, first hydraulic fluid is vented therefrom and, in response to closure of said second control valve, said second hydraulic fluid is vented therefrom.

10. A system according to claim 9, wherein said first hydraulic fluid is supplied to said first control valve from a directional control valve, via which venting of that fluid from said first control valve occurs, and said second hydraulic fluid is supplied to said second electrically operated means from another directional control valve, via which venting of that fluid from said second control valve occurs.

11. A method of shutting down a production control system for an underwater well, the system comprising:

first electrically operated means for supplying first hydraulic fluid, for opening a first control valve of the well;

second electrically operated means, for supplying second hydraulic fluid at a higher pressure than said first fluid, for opening a further control valve of the well;

electronic circuitry for providing electrical power for operating said first and second means; and

electrical power storage means, the method comprising:

controlling the sequence of closing said control valves as a result of a loss of electrical power from said electronic circuitry by, in response to said loss of power from said electronic circuitry, using electrical power from said storage means to keep said further control valve open for a period after closure of said first control valve and close it after said period.

12. A method according to claim 11, wherein said electrical power storage means is charged by electrical power from said electronic circuitry.

13. A method according to claim 11 or 12, wherein said electronic circuitry comprises at least one subsea electronics module in a subsea control module at a tree of the well.

14. A method according to any of claims 11 to 13, wherein said first electrically operated means comprises a first directional control valve and said second electrically operated means comprises a second directional control valve.

15. A method according to any of claims 11 to 14, wherein said loss of power from said electronic circuitry is detected from pressure of hydraulic fluid supplied from said first electrically operated means.

16. A method according to any of claims 11 to 15, wherein said first control valve comprises a production fluid control valve.

17. A method according to any of claims 11 to 16, wherein said further control valve comprises a surface controlled sub-surface safety valve.

18. A method according to any of claims 11 to 17, wherein, in response to closure of said first control valve, first hydraulic fluid is vented therefrom and, in response to closure of said second control valve, said second hydraulic fluid is vented therefrom.

19. A method according to claim 18, wherein said first hydraulic fluid is supplied to said first electrically operated means from a directional control valve, via which venting of that fluid from said first control valve occurs, and said second hydraulic fluid is supplied to said second electrically operated means from another directional control valve, via which venting of that fluid from said second control valve occurs.

CLAIMS:

1. A production control system for an underwater well, the production control system comprising:

a first electrically operated valves configured to supply first hydraulic fluid, for opening a first control valve of the well;

a second electrically operated valve configured to supply second hydraulic fluid at a higher pressure than the first hydraulic fluid, for opening a further control valve of the well;

electronic circuitry configured to provide electrical power for operating the first electrically operated valves and the second electrically operated valves; and

a controller configured to control the sequence of closing the control valves as a result of a loss of electrical power from the electronic circuitry, the controller comprising:

an electrical power storage;

a detector responsive to the loss of power from the electronic circuitry; and

a central processor unit coupled with the detector, wherein the central processor unit is configured to use electrical power from the electrical power storage to keep the further control valve open for a period after closure of the first control valve and close the further control valve after the period.

2. The system according to claim **1**, wherein the electrical power storage is charged by electrical power from the electronic circuitry.

3. The system according to claim **1**, wherein the electronic circuitry comprises at least one subsea electronics module in a subsea control module at a tree of the well.

4. The system according to claim **3**, wherein the electrical power storage and the central processor unit coupled with the detector are in the subsea control module.

5. The system according to claim **1**, wherein the first electrically operated valves comprises a first directional control valve, and the second electrically operated valves comprises a second directional control valve.

6. The system according to claim **1**, wherein the detector comprises a sensor responsive to the pressure of hydraulic fluid supplied from the first electrically operated valves.

7. The system according to claim **1**, wherein the first control valve comprises a production fluid control valve.

8. The system according to claim **1**, wherein the further control valve comprises a surface controlled sub-surface safety valve.

9. The system according to claim **1**, wherein, in response to the closure of the first control valve, the first hydraulic fluid is vented therefrom, and, in response to closure of the second control valve, the second hydraulic fluid is vented therefrom.

10. The system according to claim **9**, wherein the first hydraulic fluid is supplied to the first control valve from a directional control valve, via which venting of the first hydraulic fluid from the first control valve occurs, and the second hydraulic fluid is supplied to the second electrically operated valves from another directional control valve, via which venting of the second hydraulic fluid from the second control valve occurs.

11. A production control system for an underwater well, the production control system comprising:

a first directional control valve configured to supply first hydraulic fluid, for opening a first control valve of the well;

second directional control valve configured to supply second hydraulic fluid at a higher pressure than the first hydraulic fluid, for opening a further control valve of the well;

at least one subsea electronics module in a subsea control module, for providing electrical power for operating the first directional control valve and the second directional control valve; and

a controller configured to control the sequence of closing the control valves as a result of a loss of electrical power from the at least one subsea electronics module, the controller comprising:

an electrical power storage charged from the at least one subsea electronics module;

a detector responsive to the loss of power from the at least one subsea electronics module; and

a central processor unit coupled with the detector, wherein the central processor unit is configured to use electrical power from the electrical power storage to keep the further control valve open for a period after closure of the first control valve and close the further control valve after the period.

12. A method of shutting down a production control system for an underwater well, the system comprising a first electrically operated valves configured to supply first hydraulic fluid, for opening a first control valve of the well, a second electrically operated valves configured to supply second hydraulic fluid at a higher pressure than the first hydraulic fluid, for opening a further control valve of the well, electronic circuitry configured to provide electrical power for operating the first electrically operated valves and the second electrically operated valves, and an electrical power storage, the method comprising:

controlling the sequence of closing the control valves as a result of a loss of electrical power from the electronic circuitry by, in response to the loss of power from the electronic circuitry, using electrical power from the electrical power storage to keep the further control valve open for a period after closure of the first control valve and close the further control valve after the period.

13. The method according to claim **12**, wherein the electrical power storage is charged by electrical power from the electronic circuitry.

14. The method according to claim **12**, wherein the electronic circuitry comprises at least one subsea electronics module in a subsea control module at a tree of the well.

15. The method according to claim **12**, wherein the first electrically operated valves comprises a first directional control valve, and the second electrically operated valves comprises a second directional control valve.

16. The method according to claim **12**, wherein the loss of power from the electronic circuitry is detected from pressure of hydraulic fluid supplied from the first electrically operated valves.

17. The method according to claim **12**, wherein the first control valve comprises a production fluid control valve.

18. The method according to claim **12**, wherein the further control valve comprises a surface controlled sub-surface safety valve.

19. The method according to claim **12**, wherein, in response to the closure of the first control valve, the first hydraulic fluid is vented therefrom, and, in response to closure of the second control valve, the second hydraulic fluid is vented therefrom.

20. The method according to claim **19**, wherein the first hydraulic fluid is supplied to the first electrically operated valves from a directional control valve, via which venting of the first hydraulic fluid from the first control valve occurs, and the second hydraulic fluid is supplied to the second electrically operated valves from another directional control valve, via which venting of the second hydraulic fluid from the second control valve occurs.