

Claims

1. A method for controlling production shut down of an underwater fluid production well, comprising the steps of:
 - 5 a) monitoring an output signal from a sensor located at the well;
 - b) processing the signal to determine if a shut down is required; and
 - c) effecting shut down by sending a shut down signal to a device to cause actuation of a valve located at the well, said actuation causing the well to shut down production;
- 10 wherein in step b), the processing is performed by a processor located at the well.
2. A system for controlling production shut down of an underwater fluid production well, the well having a sensor for producing an output signal indicative of the state of the well and a valve which is actuatable to shut down production activity of
15 the well, the system comprising:
means for receiving the output signal; and
a processor for processing the received signal to determine if a shut down is required and outputting a shut down signal to the valve;
wherein the receiving means and processor are located at the well.
- 20 3. A method according to claim 1, comprising the step of receiving, at the well, a control signal from a surface location and logically combining this with the processor output, such that a shut down signal may be received at the valve from either the processor or from the surface location.
- 25 4. A system according to claim 2, comprising means, located at the well, for receiving a control signal from a surface location and logically combining this with the processor output, such that a shut down signal may be received at the valve from either the processor or from the surface location.
- 30 5. A method or system according to any preceding claim, wherein the processor is adapted to receive control signal received from a surface location and output a shut down signal in dependence of the control signal.

6. A method according to claim 1 or a system according to claim 2, wherein the processor is SIL-rateable.
7. A method or system according to any preceding claim, wherein the processor
5 determines if a shut down is required by comparing the sensor output with a predetermined limit.
8. A method or system according to any preceding claim, wherein the processor
10 determines if a shut down is required by comparing the sensor output with a modelled behaviour.
9. A method or system according to any preceding claim, wherein the well
comprises a plurality of sensors, and the processor receives and processes output
15 signals from each of said plurality of sensors.
10. A method or system according to any preceding claim, wherein the processor
is located within a subsea electronics module at the well head.
11. A method or system according to any preceding claim, wherein the valve
20 comprises a directional control valve.
12. A method or system according to any preceding claim, wherein the well
comprises a hydrocarbon extraction well.
- 25 13. A method substantially as herein described with reference to the
accompanying figures 2 and 3.
14. A system substantially as herein described with reference to the
accompanying figures 2 and 3.

Claims

1. A method for controlling production shut down of an underwater fluid production well, comprising the steps of:

- 5 a) monitoring an output signal from a sensor located at the well;
- b) processing the signal to determine if a shut down is required; and
- c) effecting shut down by sending a shut down signal to a device to cause actuation of a valve located at the well, said actuation causing the well to shut down production;

10 wherein in step b), the processing is performed by a processor located at the well, and wherein the method further comprises the step of receiving, at the well, a control signal from a surface location and logically combining this with the processor output, such that a shut down signal may be received at the valve from either the processor or from the surface location.

15 2. A system for controlling production shut down of an underwater fluid production well, the well having a sensor for producing an output signal indicative of the state of the well and a valve which is actuable to shut down production activity of the well, the system comprising:

- 20 means for receiving the output signal; and
- a processor for processing the received signal to determine if a shut down is required and outputting a shut down signal to the valve;
- wherein the receiving means and processor are located at the well,
- and wherein the system further comprises means, located at the well, for receiving a
- 25 control signal from a surface location and logically combining this with the processor output, such that a shut down signal may be received at the valve from either the processor or from the surface location.

3. A method or system according to any preceding claim, wherein the processor

30 is adapted to receive control signal received from a surface location and output a shut down signal in dependence of the control signal.

4. A method or system according to any preceding claim, wherein the processor determines if a shut down is required by comparing the sensor output with a predetermined limit.

5 5. A method or system according to any preceding claim, wherein the processor determines if a shut down is required by comparing the sensor output with a modelled behaviour.

10 6. A method or system according to any preceding claim, wherein the well comprises a plurality of sensors, and the processor receives and processes output signals from each of said plurality of sensors.

7. A method or system according to any preceding claim, wherein the processor is located within a subsea electronics module at the well head.

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8. A method or system according to any preceding claim, wherein the valve comprises a directional control valve.

20 9. A method or system according to any preceding claim, wherein the well comprises a hydrocarbon extraction well.

10. A method substantially as herein described with reference to the accompanying figures 2 and 3.

25 11. A system substantially as herein described with reference to the accompanying figures 2 and 3.

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