WHAT IS CLAIMED IS:

1. A method of energizing a coil of a solenoid of a directional control valve, the method comprising energizing the coil with a voltage, controlling said voltage and detecting the current in the coil at which an armature of the solenoid moves between a first position in which the solenoid is operated and a second position in which the solenoid is not operated and using that current increased by a margin as an operating current for energizing the coil of the solenoid.

2. A method according to claim 1, wherein said voltage is controlled by: increasing it; detecting when the armature moves from said second to said first position; decreasing the voltage and detecting when the armature moves from said first to said second position; increasing the voltage and detecting when the armature moves from said second to said first position; and decreasing the voltage to a level at which the current through the coil is said operating current.

3. A method according to claim 2, wherein said voltage is increased to a maximum voltage after it has been detected that the armature has moved from said second to said first position and before it is decreased.

4. A method according to any preceding claim, wherein movement of the armature is detected by detecting a perturbation in the current through the coil due to a change in the inductance of the coil due to such movement.

5. A method according to any preceding claim, wherein said voltage is controlled by pulse width modulation of voltage applied by drive circuitry for the solenoid.

6. A method according to any preceding claim, wherein the directional control valve is a directional control valve of a subsea hydrocarbon production control system.

7. A method according to claim 6, wherein said voltage is controlled by processor means in a subsea electronics module of a subsea control module.

8. An arrangement for energizing a coil of a solenoid of a directional control valve, the arrangement comprising means for energizing the coil with a voltage, and control means for controlling said voltage and detecting the current in the coil at which an armature of the solenoid moves between a first position in which the solenoid is operated and a second position in which the solenoid is not operated and using that current increased by a margin as an operating current for energizing the coil of the solenoid.

9. An arrangement according to claim 8, wherein said control means is adapted to: increase said voltage; detect when the armature moves from said second to said first position; decrease the voltage and detect when the armature moves from said first to said second position; increase the voltage and detect when the armature moves from said second to said first position; and decrease the voltage to a level at which the current through the coil is said operating current.

10. An arrangement according to claim 9, wherein said control means is adapted to increase said voltage to a maximum voltage after it has been detected that the armature has moved from said second to said first position and before it is decreased.

11. An arrangement according to any of claims 8 to 10, wherein said control means is such that movement of the armature is detected by detecting a perturbation in the current through the coil due to a change in the inductance of the coil due to such movement.

12. An arrangement according to claims 8 to 11, wherein the control means is adapted to control said voltage by pulse width modulation of voltage applied by drive circuitry for the solenoid.

13. An arrangement according to any of claims 8 to 12, wherein the directional control valve is a directional control valve of a subsea hydrocarbon production control system.

14. An arrangement according to claim 13, wherein said control means includes processor means in a subsea electronics module of a subsea control module.

WHAT IS CLAIMED IS:

1. A method of energizing a coil of a solenoid (1) of a directional control valve, the method comprising energizing the coil with a voltage, controlling said voltage to operate the solenoid with a first current and detecting a second current in the coil, at which an armature of the solenoid (1) moves between a first position, in which the solenoid (1) is operated, and a second position, in which the solenoid (1) is not operated, **characterised in that** the method further comprises using, as an operating current, less than the first current for energizing the coil of the solenoid (1), the second current being increased by a margin.

2. A method according to claim 1, wherein said voltage is controlled by: increasing it; detecting when the armature moves from said second to said first position; decreasing the voltage and detecting when the armature moves from said first to said second position; increasing the voltage and detecting when the armature moves from said second to said first position; and decreasing the voltage to a level at which the current through the coil is said operating current.

3. A method according to claim 2, wherein said voltage is increased to a maximum voltage after it has been detected that the armature has moved from said second to said first position and before it is decreased.

4. A method according to any preceding claim, wherein movement of the armature is detected by detecting a perturbation in the current through the coil due to a change in the inductance of the coil due to such movement.

5. A method according to any preceding claim, wherein said voltage is controlled by pulse width modulation of voltage applied by drive circuitry for the solenoid (1).

6. A method according to any preceding claim, wherein the directional control valve is a directional control valve of a subsea hydrocarbon production control system.

7. A method according to claim 6, wherein said voltage is controlled by processor means in a subsea electronics module (13) of a subsea control module (12).

8. An arrangement for energizing a coil of a solenoid (1) of a directional control valve, the arrangement comprising means for energizing the coil with a voltage, and control means for controlling said voltage to operate the solenoid with a first current and detecting a second current in the coil, at which an armature of the solenoid (1) moves between a first position, in which the solenoid is operated, and a second position, in which the solenoid (1) is not operated, **characterised in that** said control means is adapted to use, as an operating current, less than the first current for energizing the coil
of the solenoid (1), the second current increased by a margin.

9. An arrangement according to claim 8, wherein said control means is adapted to: increase said voltage; detect when the armature moves from said second to said first position; decrease the voltage and detect when the armature moves from said first to said second position; increase the voltage and detect when the armature moves from said second to said first position; and decrease the voltage to a level at which the current through the coil is said operating current.

10. An arrangement according to claim 9, wherein said control means is adapted to increase said voltage to a maximum voltage after it has been detected that the armature has moved from said second to said first position and before it is decreased.

11. An arrangement according to any of claims 8 to 10, wherein said control means is such that movement of the armature is detected by detecting a perturbation in the current through the coil due to a change in the inductance of the coil due to such movement.

12. An arrangement according to claims 8 to 11, wherein the control means is adapted to control said voltage by pulse width modulation of voltage applied by drive circuitry for the solenoid (1).

13. An arrangement according to any of claims 8 to 12, wherein the directional control valve is a directional control valve of a subsea hydrocarbon production control system.

14. An arrangement according to claim 13, wherein said control means includes processor means in a subsea electronics module (13) of a subsea control module (12).