Claims

1. A method of using an umbilical between a surface location and an underwater location of an underwater fluid extraction well system, the umbilical comprising an electrical power conductor configured to transmit electrical power at a first frequency from a power source at the surface location to the underwater location, the method comprising:

detecting that the umbilical has been compromised by the ingress of water and, in response thereto:

converting electrical power from power source to electrical power at a second frequency, wherein the second frequency is lower than the first frequency;

transmitting the electrical power at the second frequency to the underwater location via the conductor; and

converting, at the underwater location, the electrical power at the second frequency to electrical power at a frequency used by the underwater equipment of the well system.

2. The method of claim 1, wherein the frequency of electrical power used by the underwater equipment of the well system is the same as the first frequency.

3. The method of claim 1, wherein the umbilical is connected to a distribution unit at the underwater location.

4. The method of claim 1, wherein the umbilical is connected to a module at the underwater location, the module being position before a distribution unit of the well system.

5. The method of claim 1, wherein the underwater location is on the bed of a body of water surrounding the umbilical.

6. The method of claim 1, wherein detecting that the umbilical has been compromised by the ingress of water comprises:

monitoring a voltage of electrical power from the umbilical; and

producing an indication that the umbilical has been compromised by the ingress of water if the voltage is less than a threshold.

7. A method of using an umbilical between a surface location and an underwater location of an underwater fluid extraction well system, the umbilical comprising an electrical power conductor configured to transmit electrical power at a first frequency from a power source at the surface location to the underwater location, the method comprising:

detecting that the umbilical has been compromised by the ingress of water and, in response thereto:

converting electrical power from the source to electrical power at a second frequency, wherein the second frequency is lower than the first frequency;

transmitting the electrical power at the second frequency to the underwater location via the conductor; and

converting, at the underwater location, the electrical power at the second frequency to electrical power at a frequency used by the underwater equipment of the well system, wherein:

the frequency of electrical power used by the underwater equipment of the well system is the same as the first frequency; and

detecting that the umbilical has been compromised by the ingress of water comprises:

monitoring a voltage of electrical power from the umbilical; and producing an indication that the umbilical has been compromised by the ingress of water if the voltage is less than a threshold.

8. An underwater fluid extraction well system, comprising:

a power source of electrical power at a first frequency positioned at a surface location;

an umbilical comprising an electrical conductor, wherein the umbilical is configured to transmit electrical power from the power source via the electrical conductor of the umbilical to an underwater location for use by underwater equipment of the well system;

a detector configured to detect that the umbilical has been compromised by the ingress of water;

a first converter positioned at the surface location, wherein upon detection of an ingress of water, the first converter is configured to convert electrical power from the power source to electrical power at a second frequency, wherein the second frequency is lower than the first frequency; and

a second converter positioned at the underwater location configured to convert electrical power at the second frequency to electrical power at a frequency used by said underwater equipment of the well system.

9. The system of claim 8, wherein the detector comprises monitoring equipment configured to monitor a voltage of electrical power from the umbilical and to produce an indication that the umbilical is compromised by the ingress of water if the voltage is less than a threshold.