WHAT IS CLAIMED IS:

1. A subsea well assembly comprising:

an umbilical connected to a power source on a platform;

a connector for connecting the umbilical to a receptacle in the subsea well assembly;

a subsea control module delivering power and control signals to the subsea well assembly; and

an impressed current protection module integrated in the subsea control module, the impressed current protection module receiving power from the umbilical.

2. A wellhead assembly of Claim 1, wherein the subsea control module further includes:

a power pack having the inductor disposed therein, the power pack adapted to receive the alternating current signal from the umbilical and adapted to deliver power to components in the subsea control module;

a subsea electronics module, powered by the power pack, the subsea electronics module monitoring various measurements in the wellhead assembly, including temperatures and pressures of various hydraulic lines and actuating directional control valves to control a flow of hydraulic fluid through the lines and valves of the well assembly and delivering power to the impressed current protection module.

3. A wellhead assembly of Claim 2, wherein the subsea control module further includes:

a fluid reservoir, connected to the directional control valves and a pump, the fluid reservoir supplying hydraulic fluid to the wellhead assembly, the fluid reservoir having outlet lines and return lines.

4. A wellhead assembly of Claim 3, wherein the anode is fabricated from zinc.

5. A wellhead assembly of Claim 4, wherein the anode comprises a plurality of anodes distributed along a sea floor.

6. A wellhead assembly of Claim 1, wherein the impressed current protection module further comprises:

positive and negative terminals, the positive terminal being connected to the anode, and the negative terminal connected the wellhead assembly.

7. A wellhead assembly of Claim 6, wherein the negative terminal is connected to the housing of the subsea control module.

8. A wellhead assembly of Claim 6, wherein the impressed current protection module further comprises:

a transformer to adjust the power delivered to the anode, and

an AC to DC converter to convert an AC voltage from the transformer to a DC voltage for delivery to the anodes.

What is claimed is:

1. A subsea well assembly comprising:

a wellhead;

an umbilical connected to a power source on a surface platform;

a connector for connecting the umbilical to a receptacle in the subsea well assembly;

a subsea control module delivering power and control signals to components of the subsea well assembly;

at least one anode positioned to protect the well assembly from corrosion;

an impressed current protection module integrated in the subsea control module, the impressed current protection module receiving power from the umbilical to provide impressed current cathodic protection to the well assembly, the impressed current protection module comprising a positive terminal and a negative terminal, the positive terminal operably coupled to the at least one anode and the negative terminal operably grounded on one or more of the following: a housing of the subsea control module, the wellhead, a portion of a production tree or manifold associated with the wellhead.

2. A well assembly of claim 1, wherein the subsea control module further includes:

a power pack having an inductor disposed therein, the power pack adapted to receive an alternating current signal from the umbilical and adapted to deliver power to components in the subsea control module;

a subsea electronics module, powered by the power pack, and configured to deliver power to the impressed current protection module.

3. A well assembly of claim 2, wherein the subsea control module further includes:

a fluid reservoir, connected to directional control valves and a pump, the fluid reservoir supplying hydraulic fluid to the well assembly, the fluid reservoir having outlet lines and return lines.

4. A well assembly of claim 3, wherein the at least one anode is fabricated from zinc.

5. A well assembly of claim 4, wherein the at least one anode comprises a plurality of anodes distributed along a sea floor.

6. A well assembly of claim 1, wherein the negative terminal is connected to the housing of the subsea control module.

7. A well assembly of claim 1, wherein the impressed current protection module further comprises:

a transformer to adjust the power delivered to the at least one anode, and

an AC to DC converter to convert an AC voltage from the transformer to a DC voltage for delivery to the at least one anode.

8. A well assembly as defined in claim 1, wherein the negative terminal is operably grounded on a portion of the production tree connected to the wellhead.

9. A well assembly as defined in claim 1, wherein the at least one anode is connected to a portion of the production tree connected to the wellhead.

10. A subsea well assembly comprising:

a wellhead;

an umbilical connected to a power source on a surface platform;

a connector for connecting the umbilical to a receptacle in the subsea well assembly;

a subsea control module delivering power and control signals to components of the subsea well assembly;

at least one anode positioned to protect the well assembly from corrosion;

a subsea electronics module configured to deliver power to an impressed current protection module; and

the impressed current protection module integrated in the subsea control module to provide impressed current cathodic protection to the well assembly and comprising:

a power supply to receive power from the umbilical through the subsea electronics module,

a positive terminal operably connected to the at least one anode,

a negative terminal operably grounded on one or more of the following: a housing of the subsea control module, the wellhead, a portion of a production tree or manifold associated with the wellhead, and

an AC to DC converter operably coupled to the power supply and operably coupled the positive and negative terminals.