

Claims

What is claimed is:

1. A system for powering electronics located in a wellbore intersecting a subterranean earth formation, comprising:
 - a battery locatable in the wellbore;
 - a turbine generator locatable in the wellbore so as to be in fluid communication with a flow path in the wellbore;
 - an electronic device locatable in the wellbore and electrically coupled to the battery and the turbine generator; and
 - a processor configured to determine if a power condition is satisfied to allow the turbine generator to power the electronic device.
2. The system of claim 1, wherein the electronic device is powered by the battery if the power condition is not satisfied.
3. The system of claim 1, wherein the electronic device includes any one or combination of a sensor, a valve, a pump, and an actuator.
4. The system of claim 3, wherein the sensor is configured to measure any one or combination of pressure, flow rate, tool position, tool orientation, valve position, vibration, fluid composition, and temperature.
5. The system of claim 1, wherein the processor is configured to select only the turbine generator to power the electronic device.
6. The system of claim 1, further comprising a flow control device in communication with and configured to control the flow of fluid through the flow path.
7. The system of claim 1, wherein the battery is a primary battery, and the power condition includes any one or combination of a power threshold, time duration, pressure, flow rate, and temperature.

8. A method of powering electronics located in a wellbore intersecting a subterranean earth formation, comprising:
- powering an electronic device located in the wellbore using a battery;
 - opening a closed flow path in communication with a turbine generator; and
 - powering the electronic device using the turbine generator if a power condition is satisfied.
9. The method of claim 8, further comprising performing a completion operation while using the electronic device.
10. The method of claim 8, further comprising stimulating the formation while using the electronic device.
11. The method of claim 8, wherein the electronic device includes any one or combination of a sensor, a valve, a pump, and an actuator.
12. The method of claim 11, wherein the sensor is configured to measure any one or combination of pressure, flow rate, tool position, tool orientation, valve position, vibration, fluid composition, and temperature.
13. The method of claim 8, further comprising closing the flow path in communication with the turbine generator using a flow control device during a completion operation.
14. The method of claim 8, wherein the battery is a primary battery, and the power condition includes any one or a combination of a power threshold, time duration, pressure, flow rate, and temperature.
15. The method of claim 8, further opening the closed flow path only after formation stimulation is completed.
16. The method of claim 8, further opening the closed flow path during formation stimulation.

17. A power control device, comprising:
- a battery locatable in a wellbore;
 - a turbine generator locatable in the wellbore so as to be in fluid communication with a flow path in the wellbore; and
 - a processor configured to determine if a power condition is satisfied to allow the turbine generator to power an electronic device locatable in the wellbore.
18. The power control device of claim 17, wherein the processor is configured to power the electronic device only with the battery if the power condition is not satisfied.
19. The power control device of claim 17, further comprising a power sensor configured to measure the power condition of the battery and the turbine generator.
20. The power control device of claim 17, wherein the battery is a primary battery, and the power condition includes any one or combination of a power threshold of the turbine generator, a power threshold of the battery, time duration, pressure, flow rate, and temperature.