INLINE RETRIEVABLE SYSTEM

BACKGROUND

[0001] This section is intended to introduce the reader to various aspects of art that may be related to various aspects of the present invention, which are described and/or claimed below. This discussion is believed to be helpful in providing the reader with background information to facilitate a better understanding of the various aspects of the present invention. Accordingly, it should be understood that these statements are to be read in this light, and not as admissions of prior art.

[0002] Wells are often used to access resources below the surface of the earth. For instance, oil, natural gas, and water are often extracted via a well. Some wells are used to inject materials below the surface of the earth, e.g., to sequester carbon dioxide, to store natural gas for later use, or to inject steam or other substances near an oil well to enhance recovery. Due to the value of these subsurface resources, wells are often drilled at great expense, and great care is typically taken to extend their useful life.

[0003] Chemical-injection management systems are often used to maintain a well and/or enhance well output. For example, chemical-injection management systems may inject chemicals to extend the life of a well or increase the rate at which resources are extracted from a well. Typically, these materials are injected into the well in a controlled manner over a period of time by the chemical-injection management system.

SUMMARY

[0003A] According to a first aspect, there is provided a system, comprising: an inline retrievable module, comprising: a fluid conduit configured to removably mount inline within a fluid passage of a hydrocarbon extraction system; a first coupler having a first range of axial movement at a first end portion of the fluid conduit; a second coupler having a second range of axial movement at a second end portion of the fluid conduit; and an actuation system configured to actuate the first and second couplers to move along the respective first and second axial ranges of movement between coupled positions and uncoupled positions relative to the fluid conduit.

[0003B] According to a second aspect, there is provided a method, comprising: inserting an inline retrievable module into a fluid flow path of a hydrocarbon extraction system, wherein the inline retrievable module comprises a first coupler at a first end of the inline retrievable module and a second coupler opposite the first coupler at a second end of

the inline retrievable module; and engaging the first and second couplers with an actuation system that axially inserts the first and second couplers into the hydrocarbon extraction system and axially retracts the first and second couplers from the hydrocarbon extraction system.

[0003C] According to a third aspect, there is provided a system, comprising: an inline retrievable module, comprising: a conduit configured to removably mount inline within a passage of a hydrocarbon extraction system through a lateral opening into the passage; first and second couplers configured to couple opposite first and second end portions of the conduit to the hydrocarbon extraction system and enable fluid flow through the conduit; an actuation system configured to actuate the first and second couplers to move the first and second couplers between coupled and uncoupled positions relative to the conduit; and a controller coupled to the activation system, wherein the controller is configured to control actuation of the actuation system to move the first and second couplers between the coupled and uncoupled positions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] Various features, aspects, and advantages of the present invention will become better understood when the following detailed description is read with reference to the accompanying figures in which like characters represent like parts throughout the figures, wherein:

CLAIMS

1. A system, comprising:

an inline retrievable module, comprising:

a fluid conduit configured to removably mount inline within a fluid passage of a hydrocarbon extraction system;

a first coupler having a first range of axial movement at a first end portion of the fluid conduit;

a second coupler having a second range of axial movement at a second end portion of the fluid conduit; and

an actuation system configured to actuate the first and second couplers to move along the respective first and second axial ranges of movement between coupled positions and uncoupled positions relative to the fluid conduit.

2. The system of claim 1, comprising a controller configured to control the actuation system.

3. The system of claim 1, wherein the fluid conduit comprises a first electrical connector configured to mate with a second electrical connector of the hydrocarbon extraction system.

4. The system of claim 1, wherein the in-line retrievable module comprises a housing coupled to the fluid conduit, wherein the housing encloses the actuation system and the controller.

5. The system of claim 1, wherein the actuation system comprises a hydraulic actuation system.

6. The system of claim 1, wherein the actuation system comprises a mechanical actuation system.

7. The system of claim 6, wherein the mechanical actuation system comprises an electric motor.

8. The system of claim 1, wherein the in-line retrievable module comprises a flow meter within the fluid conduit and inline with the fluid passage.

9. The system of claim 8, wherein the flow meter is an ultrasonic flow meter.

10. The system of claim 1, wherein the in-line retrievable module comprises a non-return valve within the fluid conduit and inline with the fluid passage.

11. The system of claim 1, wherein the in-line retrievable module comprises a sensor within the fluid conduit.

12. The system of claim 1, wherein the hydrocarbon extraction system comprises a Christmas tree.

13. A method, comprising:

inserting an inline retrievable module into a fluid flow path of a hydrocarbon extraction system, wherein the inline retrievable module comprises a first coupler at a first end of the inline retrievable module and a second coupler opposite the first coupler at a second end of the inline retrievable module; and

engaging the first and second couplers with an actuation system that axially inserts the first and second couplers into the hydrocarbon extraction system and axially retracts the first and second couplers from the hydrocarbon extraction system.

14. The method of claim 13, comprising electrically connecting the inline retrievable system to the hydrocarbon extraction system.

15. The method of claim 13, comprising controlling fluid flow through the inline retrievable module with a flow meter.

16. A system, comprising:

an inline retrievable module, comprising:

a conduit configured to removably mount inline within a passage of a hydrocarbon extraction system through a lateral opening into the passage;

first and second couplers configured to couple opposite first and second end portions of the conduit to the hydrocarbon extraction system and enable fluid flow through the conduit;

an actuation system configured to actuate the first and second couplers to move the first and second couplers between coupled and uncoupled positions relative to the conduit; and

a controller coupled to the activation system, wherein the controller is configured to control actuation of the actuation system to move the first and second couplers between the coupled and uncoupled positions.

17. The system of claim 16, wherein the inline retrievable system comprises a flow meter.

18. The system of claim 16, wherein the inline retrievable system comprises a sensor.

19. The system of claim 16, wherein the actuation system comprises a hydraulic actuation system.

20. The system of claim 16, wherein the actuation system comprises a mechanical actuation system.