

We claim:

1. A device for collecting a hydrocarbon mixture in an underwater environment, comprising:
 - a. a body portion adapted for directing the flow of a hydrocarbon mixture into a conduit;
 - b. at least one conduit that penetrates said body portion and receives said hydrocarbon mixture,
wherein said hydrocarbon mixture comprises water and a member of the group consisting of gaseous hydrocarbons, liquid hydrocarbons and mixtures thereof;
 - c. a bottom portion that is connected adjacent to the body portion, said bottom portion having an opening that allows entry of said hydrocarbon mixture into the body portion,
 - d. a mechanism for preventing the formation of gas hydrate crystals inside the device,
wherein said mechanism comprises a member of the group consisting of at least one internal screen, at least one heating device, at least one injector for injecting a fluid and combinations thereof.
2. The device of claim 1, further comprising at least one positioning apparatus, wherein said positioning apparatus is capable of providing thrust to allow the apparatus to be moved via remote control.
3. The device of claim 2, wherein each positioning apparatus comprises an electric thruster.
4. The device of claim 1, wherein each internal screen is heated by a mechanism selected from the group consisting of resistive heating, inductive heating, flowing a heated fluid through hollow wires that are arranged to comprise said internal screen and combinations thereof.
5. The device of claim 1, wherein each conduit comprises a member selected from the group consisting of a top-tensioned riser, a free-standing hybrid riser, a steel catenary riser, a flexible riser and combinations thereof.

6. The device of claim 1, wherein each injector is adapted for injecting a fluid comprising a member of the group consisting of salt solutions, methanol, glycols, kinetic hydrate inhibitors, poly(*N*-vinyl pyrrolidone), *N*-vinylcaprolactam, dimethylamino-ethylmethacrylate, quaternary ammonium bromide, anti-agglomerants, and combinations thereof.
7. A method for collecting a hydrocarbon mixture in an underwater environment, comprising:
 - a. providing the device of claim 1;
 - b. positioning the device underwater above a source that is producing a hydrocarbon mixture,
wherein said hydrocarbon mixture comprises water and a member of the group consisting of gaseous hydrocarbons, liquid hydrocarbons and mixtures thereof;
 - c. collecting at least a portion of the hydrocarbon mixture with the device,
wherein a mechanism at least partially prevents the formation of gas hydrate crystals inside the device,
wherein said mechanism comprises a member of the group consisting of at least one internal screen, at least one heating device, at least one injector for injecting a fluid and combinations thereof;
 - d. conveying the hydrocarbon mixture collected in step (c) via at least one conduit to at least one surface vessel;
 - e. separating the hydrocarbon mixture onboard said at least one surface vessel, to produce gaseous hydrocarbons, liquid hydrocarbons and water;
 - f. storing the separated liquid hydrocarbons onboard said at least one surface vessel.
8. The method of claim 7, wherein the device further comprises at least one positioning apparatus that is capable of providing thrust to allow the device to be moved via remote control.
9. The method of claim 7, wherein each internal screen is heated by a mechanism selected from the group consisting of resistive heating, inductive heating, flowing a heated fluid through hollow wires that are arranged to comprise said internal screen and combinations thereof, thereby melting at least a portion of any hydrate crystals retained on the screen.

10. The method of claim 7, wherein each injector injects a fluid comprising a member of the group consisting of salt solutions, methanol, glycols, kinetic hydrate inhibitors, poly(*N*-vinyl pyrrolidone), *N*-vinylcaprolactam, dimethylamino-ethylmethacrylate, quaternary ammonium bromide, anti-agglomerants and combinations thereof.
11. The method of claim 7, wherein each conduit comprises a member selected from the group consisting of a top-tensioned riser, a free-standing hybrid riser, a steel catenary riser, a flexible riser and combinations thereof.
12. The method of claim 7, wherein the hydrocarbon mixture is loaded into each surface vessel via a submerged turret loading system.
13. A system for collecting hydrocarbons in an underwater environment, comprising:
- a) a device for collecting a hydrocarbon mixture in an underwater environment, comprising:
 - a. a body portion that connects to at least one conduit that penetrates the body portion,
wherein said body portion is adapted for directing the flow of a hydrocarbon mixture from said body portion into the conduit,
wherein said hydrocarbon mixture comprises water and a member of the group consisting of gaseous hydrocarbons, liquid hydrocarbons and mixtures thereof;
 - b. a bottom portion that is connected adjacent to the body portion, said bottom portion having an opening that allows entry of the hydrocarbon mixture into the body portion,
 - c. a mechanism for preventing the formation of gas hydrate crystals inside the device,
wherein said mechanism comprises a member of the group consisting of at least one internal screen, at least one heating device, at least one injector for injecting a fluid and combinations thereof;

- b) at least one conduit for conducting the hydrocarbon mixture to at least one surface vessel;
 - c) at least one surface vessel connected to said at least one conduit, each surface vessel being adapted for receiving the hydrocarbon mixture via said at least one conduit;
 - d) a processing system located onboard each surface vessel adapted for separating the hydrocarbon mixture into gaseous hydrocarbons, liquid hydrocarbons and water.
14. The system of claim 13, wherein said at least one conduit comprises a member selected from the group consisting of a top-tensioned riser, a free-standing hybrid riser, a steel catenary riser, a flexible riser and combinations thereof.
15. The system of claim 13, wherein the device of part (a) further comprises at least one positioning apparatus attached to the device, wherein each positioning apparatus is adapted for providing thrust to allow the device of part (a) to be moved via remote control.
16. The system of claim 13, wherein each positioning device comprises an electric thruster.
17. The system of claim 13, wherein each internal screen is adapted for being heated by a mechanism selected from the group consisting of resistive heating, inductive heating, flowing a heated fluid through hollow wires that are arranged to comprise said internal screen and combinations thereof.
18. The system of claim 13, wherein each injector is adapted for injecting a fluid comprising a member of the group consisting of salt solutions, methanol, ethylene glycol, propylene glycol, kinetic hydrate inhibitors, poly(*N*-vinyl pyrrolidone), *N*-vinylcaprolactam, dimethylamino-ethylmethacrylate, quaternary ammonium bromide, anti-agglomerants, and combinations thereof.
19. The system of claim 13, wherein each surface vessel is adapted for receiving the hydrocarbon mixture from said at least one conduit via a submerged turret loading system.

We claim:

1. A device for collecting a hydrocarbon mixture in an underwater environment, comprising:

a body portion adapted for directing the flow of a hydrocarbon mixture into a conduit, wherein a bottom of the body portion has an opening that allows entry of the hydrocarbon mixture into the body portion;

at least one conduit that penetrates said body portion and receives said hydrocarbon mixture, wherein said hydrocarbon mixture comprises water and a member of the group consisting of gaseous hydrocarbons, liquid hydrocarbons and mixtures thereof;

at least one heated internal screen for preventing the formation of gas hydrate crystals inside the device, wherein each internal screen is heated by a mechanism selected from the group consisting of inductive heating and flowing a heated fluid through hollow wires that are arranged to comprise said internal screen.

2. The device of claim 1, further comprising at least one positioning apparatus, wherein said positioning apparatus is capable of providing thrust to allow the apparatus to be moved via remote control.

3. The device of claim 2, wherein each positioning apparatus comprises an electric thruster.

4. The device of claim 1, wherein each internal screen is heated by flowing the heated fluid through the hollow wires.

5. The device of claim 1, wherein each conduit comprises a member selected from the group consisting of a top-tensioned riser, a free-standing hybrid riser, a flexible riser and combinations thereof.

6. The device of claim 1, further comprising an injector adapted for injecting a fluid comprising a member of the group consisting of salt solutions, methanol, glycols, kinetic hydrate inhibitors, poly(N-vinyl pyrrolidone), N-vinylcaprolactam, dimethylamino-ethylmethacrylate, quaternary ammonium bromide, anti-agglomerants, and combinations thereof.

7. A method for collecting a hydrocarbon mixture in an underwater environment, comprising:

positioning a device underwater above a source that is producing a hydrocarbon mixture, wherein said hydrocarbon mixture comprises water and a member of the group consisting of gaseous hydrocarbons, liquid hydrocarbons and mixtures thereof;

collecting at least a portion of the hydrocarbon mixture with the device,

heating at least one internal screen inside the device to at least partially prevent clogging of the device due to gas hydrate crystals, wherein each internal screen is heated by a mechanism selected from the group consisting of inductive heating and flowing a heated fluid through hollow wires that are arranged to comprise said internal screen, thereby melting at least a portion of any hydrate crystals retained on the screen;

conveying the hydrocarbon mixture collected with the device via at least one conduit to at least one surface vessel;

separating the hydrocarbon mixture onboard said at least one surface vessel, to produce gaseous hydrocarbons, liquid hydrocarbons and water;

storing the separated liquid hydrocarbons onboard said at least one surface vessel.

8. The method of claim 7, wherein the device further comprises at least one positioning apparatus that is capable of providing thrust to allow the device to be moved via remote control.

9. The method of claim 7, wherein each internal screen is heated by flowing the heated fluid through the hollow wires.

10. The method of claim 7, further comprising injecting into the hydrocarbon mixture a fluid comprising a member of the group consisting of salt solutions, methanol, glycols, kinetic hydrate inhibitors, poly(N-vinyl pyrrolidone), N-vinylcaprolactam, dimethylamino-ethylmethacrylate, quaternary ammonium bromide, anti-agglomerants and combinations thereof.

11. The method of claim 7, wherein each conduit comprises a member selected from the group consisting of a top-tensioned riser, a free-standing hybrid riser, a flexible riser and combinations thereof.

12. The method of claim 7, wherein the hydrocarbon mixture is loaded into each surface vessel via a submerged turret loading system.

13. A system for collecting hydrocarbons in an underwater environment, comprising:

a) a device for collecting a hydrocarbon mixture in an underwater environment, comprising:

a body portion that connects to at least one conduit that penetrates the body portion,

wherein said body portion is adapted for directing the flow of a hydrocarbon mixture from said body portion into the conduit and a bottom of the body portion has an opening that allows entry of the hydrocarbon mixture into the body portion,

wherein said hydrocarbon mixture comprises water and a member of the group consisting of gaseous hydrocarbons, liquid hydrocarbons and mixtures thereof;

at least one heated internal screen for preventing the formation of gas hydrate crystals inside the device, wherein each internal screen is adapted for being heated by a mechanism selected from the group consisting of inductive heating and flowing a heated fluid through hollow wires that are arranged to comprise said internal screen;

b) at least one conduit for conducting the hydrocarbon mixture to at least one surface vessel;

c) at least one surface vessel connected to said at least one conduit, each surface vessel being adapted for receiving the hydrocarbon mixture via said at least one conduit;

d) a processing system located onboard each surface vessel adapted for separating the hydrocarbon mixture into gaseous hydrocarbons, liquid hydrocarbons and water.

14. The system of claim 13, wherein said at least one conduit comprises a member selected from the group consisting of a top-tensioned riser, a free-standing hybrid riser, a flexible riser and combinations thereof.

15. The system of claim 13, wherein the device of part (a) further comprises at least one positioning apparatus attached to the device, wherein each positioning apparatus is adapted for providing thrust to allow the device of part (a) to be moved via remote control.

16. The system of claim 15, wherein each positioning apparatus comprises an electric thruster.

17. The system of claim 13, wherein each internal screen is adapted for being heated by flowing the heated fluid through the hollow wires.

18. The system of claim 13, further comprising an injector adapted for injecting a fluid comprising a member of the group consisting of salt solutions, methanol, ethylene glycol, propylene glycol, kinetic hydrate inhibitors, poly(N-vinyl pyrrolidone), N-vinylcaprolactam, dimethylamino-ethylmethacrylate, quaternary ammonium bromide, anti-agglomerants, and combinations thereof.

19. The system of claim 13, wherein each surface vessel is adapted for receiving the hydrocarbon mixture from said at least one conduit via a submerged turret loading system.