

CLAIMS

1. A system comprising:
 - a wellhead;
 - a tubing hanger configured to suspend tubing from the wellhead; and
 - a tubing hanger running tool (THRT) configured to position the tubing hanger within the wellhead, wherein the THRT comprises an integrated pressure equalization system, comprising:
 - an inlet in fluid communication with an annulus of the wellhead;
 - a tube having a first end in fluid communication with the inlet, and a second end in fluid communication with a control line;
 - a piston disposed within the tube, wherein pressure of a first fluid within the annulus drives the piston to pressurize a second fluid within the control line; and
 - a gas reduction system comprising a second inlet in fluid communication with a port into the tube, wherein the second inlet is configured to receive a flow of the second fluid to pressurize the tube and the control line.
2. The system of claim 1, wherein the piston comprises a seal disposed between the piston and the tube to substantially block a flow of the first fluid into the second fluid.
3. The system of claim 1, wherein the second inlet comprises a check valve configured to facilitate flow of the second fluid into the tube, and to block flow of second fluid out of the tube.
4. The system of claim 1, wherein the integrated pressure equalization system comprises a connector disposed at the second end of the tube, and configured to interface with a corresponding connector coupled to the control line within the tubing hanger.
5. The system of claim 1, wherein the THRT comprises a plurality of integrated pressure equalization systems, and wherein each of the plurality of integrated

pressure equalization systems is configured to block a flow of the second fluid between the plurality of integrated pressure equalization systems.

6. The system of claim 1, comprising an integrated soft landing system, comprising:

an annular chamber disposed between an outer casing of the THRT and a body of the THRT, wherein the annular chamber is configured to contain sufficient hydraulic fluid to suspend the body relative to the outer casing; and

a valve in fluid communication with the annular chamber, wherein opening the valve facilitates flow of the hydraulic fluid from the annular chamber.

7. The system of claim 6, wherein the integrated soft landing system comprises a release mechanism coupled to the valve, wherein activation of the release mechanism opens the valve.

8. The system of claim 7, wherein the release mechanism comprises a ledge configured to interface with a wire line trip such that movement of the wire line trip activates the release mechanism.

9. The system of claim 1, wherein the piston is configured to move through the tube in an axial direction along an axis of the wellhead.

10. A system comprising:

a tubing hanger running tool (THRT) configured to position a tubing hanger within a wellhead, wherein the THRT comprises an integrated pressure equalization system, comprising:

a tube having a first end in fluid communication with an annulus of the wellhead, and a second end in fluid communication with a control line;

a piston disposed within the tube, wherein the piston is configured to move within the tube to balance a pressure differential between a first fluid within the annulus and a second fluid within the control line; and

an integrated soft landing system, comprising:

an annular chamber disposed between an outer casing of the THRT and a body of the THRT, wherein the annular chamber is configured to

contain sufficient hydraulic fluid to suspend the body relative to the outer casing;

a valve in fluid communication with the annular chamber; and

a release mechanism coupled to the valve, wherein activation of the release mechanism opens the valve to facilitate flow of the hydraulic fluid from the annular chamber.

11. The system of claim 10, wherein the valve is also in fluid communication with the annulus of the wellhead, and wherein opening the valve facilitates flow of hydraulic fluid from the annular chamber to the annulus.

12. The system of claim 10, wherein the valve comprises a valve stem and a valve body, wherein movement of the valve stem relative to the valve body causes the valve to transition between an open position and a closed position.

13. The system of claim 12, wherein the valve comprises a spring disposed between the valve stem and the valve body, wherein the spring is configured to bias the valve toward the closed position.

14. The system of claim 12, wherein contact between the valve stem and a flat surface of the release mechanism drives the valve to the open position.

15. The system of claim 10, wherein the release mechanism comprises a ledge configured to interface with a wire line trip such that movement of the wire line trip activates the release mechanism.

16. The system of claim 10, wherein the piston is configured to move through the tube in an axial direction along an axis of the wellhead.

17. A system comprising:

a tubing hanger running tool (THRT) configured to position a tubing hanger within a wellhead, wherein the THRT comprises a plurality of integrated pressure equalization systems, at least one of the plurality of integrated pressure equalization systems comprising:

a tube having a first end in fluid communication with an annulus of the wellhead, and a second end in fluid communication with a control line; and

a piston disposed within the tube, wherein pressure of a first fluid within the annulus drives the piston to pressurize a second fluid within the control line;

wherein each of the plurality of integrated pressure equalization systems is configured to block a flow of the second fluid between the plurality of integrated pressure equalization systems.

18. The system of claim 17, wherein at least one of the plurality of integrated pressure equalization systems comprises a gas reduction system comprising an inlet in fluid communication with a port into the tube, wherein the inlet is configured to receive a flow of the second fluid to pressurize the tube and the control line.

19. The system of claim 17, comprising an integrated soft landing system, comprising:

an annular chamber disposed between an outer casing of the THRT and a body of the THRT, wherein the annular chamber is configured to contain sufficient hydraulic fluid to suspend the body relative to the outer casing;

a valve in fluid communication with the annular chamber; and

a release mechanism coupled to the valve, wherein activation of the release mechanism opens the valve to facilitate flow of the hydraulic fluid from the annular chamber.

20. The system of claim 17, wherein the piston is configured to move through the tube in an axial direction along an axis of the wellhead.

CLAIMS

1. A system comprising:
 - a wellhead;
 - a tubing hanger configured to suspend tubing from the wellhead; and
 - a tubing hanger running tool (THRT) configured to position the tubing hanger within the wellhead, wherein the THRT comprises an integrated pressure equalization system, comprising:
 - an inlet in fluid communication with an annulus of the wellhead;
 - a tube having a first end in fluid communication with the inlet, and a second end in fluid communication with a control line;
 - a piston disposed within the tube, wherein pressure of a first fluid within the annulus drives the piston to pressurize a second fluid within the control line; and
 - a gas reduction system comprising a second inlet in fluid communication with a port into the tube, wherein the second inlet is configured to receive a flow of second fluid to pressurize the tube and the control line.
2. The system of claim 1, wherein the piston comprises a seal disposed between the piston and the tube to substantially block a flow of the first fluid into the second fluid.
3. The system of claim 1, wherein the second inlet comprises a check valve configured to facilitate flow of the second fluid into the tube, and to block flow of the second fluid out of the tube.
4. The system of claim 1, wherein the integrated pressure equalization system comprises a connector disposed at the second end of the tube, and configured to interface with a corresponding connector coupled to the control line within the tubing hanger.

5. The system of claim 1, wherein the THRT comprises a plurality of integrated pressure equalization systems, and wherein each of the plurality of integrated pressure equalization systems is configured to block a flow of the second fluid between the plurality of integrated pressure equalization systems.
6. The system of claim 1, comprising an integrated soft landing system, comprising:
 - an annular chamber disposed between an outer casing of the THRT and a body of the THRT, wherein the annular chamber is configured to contain sufficient hydraulic fluid to suspend the body relative to the outer casing; and
 - a valve in fluid communication with the annular chamber, wherein opening the valve facilitates flow of the hydraulic fluid from the annular chamber.
7. The system of claim 6, wherein the integrated soft landing system comprises a release mechanism coupled to the valve, wherein activation of the release mechanism opens the valve.
8. The system of claim 7, wherein the release mechanism comprises a ledge configured to interface with a wire line trip such that movement of the wire line trip activates the release mechanism.
9. A system comprising:
 - a tubing hanger running tool (THRT) configured to position a tubing hanger within a wellhead, wherein the THRT comprises an integrated pressure equalization system, comprising:
 - a tube having a first end in fluid communication with an annulus of the wellhead, and a second end in fluid communication with a control line;
 - a piston disposed within the tube, wherein the piston is configured to move within the tube to balance a pressure differential between a first fluid within the annulus and a second fluid within the control line; and
 - an integrated soft landing system, comprising:

an annular chamber disposed between an outer casing of the THRT and a body of the THRT, wherein the annular chamber is configured to contain sufficient hydraulic fluid to suspend the body relative to the outer casing;
a valve in fluid communication with the annular chamber; and
a release mechanism coupled to the valve, wherein activation of the release mechanism opens the valve to facilitate flow of the hydraulic fluid from the annular chamber.

10. The system of claim 9, wherein the valve is also in fluid communication with the annulus of the wellhead, and wherein opening the valve facilitates flow of hydraulic fluid from the annular chamber to the annulus.

11. The system of claim 9, wherein the valve comprises a valve stem and a valve body, wherein movement of the valve stem relative to the valve body causes the valve to transition between an open position and a closed position.

12. The system of claim 11, wherein the valve comprises a spring disposed between the valve stem and the valve body, wherein the spring is configured to bias the valve toward the closed position.

13. The system of claim 11, wherein contact between the valve stem and a flat surface of the release mechanism drives the valve to the open position.

14. The system of claim 9, wherein the release mechanism comprises a ledge configured to interface with a wire line trip such that movement of the wire line trip activates the release mechanism.

15. A system comprising:
a tubing hanger running tool (THRT) configured to position a tubing hanger within a wellhead, wherein the THRT comprises a plurality of integrated pressure equalization systems, at least one of the plurality of integrated pressure equalization systems comprising:

a tube having a first end in fluid communication with an annulus of the wellhead, and a second end in fluid communication with a control line; and
a piston disposed within the tube, wherein pressure of a first fluid within the annulus drives the piston to pressurize a second fluid within the control line;

wherein each of the plurality of integrated pressure equalization systems is configured to block a flow of the second fluid between the plurality of integrated pressure equalization systems.

16. The system of claim 15, wherein at least one of the plurality of integrated pressure equalization systems comprises a gas reduction system comprising an inlet in fluid communication with a port into the tube, wherein the inlet is configured to receive a flow of the second fluid to pressurize the tube and the control line.

17. The system of claim 15, comprising an integrated soft landing system, comprising:

an annular chamber disposed between an outer casing of the THRT and a body of the THRT, wherein the annular chamber is configured to contain sufficient hydraulic fluid to suspend the body relative to the outer casing;

a valve in fluid communication with the annular chamber; and

a release mechanism coupled to the valve, wherein activation of the release mechanism opens the valve to facilitate flow of the hydraulic fluid from the annular chamber.

18. The system of claim 1, wherein the piston is configured to move through the tube in an axial direction along an axis of the wellhead.

19. The system of claim 9, wherein the piston is configured to move through the tube in an axial direction along an axis of the wellhead.

20. The system of claim 15, wherein the piston is configured to move through the tube in an axial direction along an axis of the wellhead.