CLAIMS

WHAT IS CLAIMED IS:

1. A running tool for raising and/or lowering a subsea wellhead member, the running tool comprising:

   a tool body having an axis;

   a latch on the tool body;

   an offset member attached to the tool body; and

   a lift arm affixed to the offset member, the lift arm selectively offset from the tool axis to accommodate for asymmetric weight distribution in the subsea wellhead member.

2. The running tool of claim 1, further comprising a profile on the latch formed for mating engagement with a profile in a bore of the subsea wellhead member.

3. The running tool of claim 1, wherein the subsea wellhead member comprises a christmas tree.

4. The running tool of claim 1, further comprising a subsea wellhead member pressure testing system that includes an extension disposed on the body bottom and flow nozzles formed on the extension in selective fluid communication with a pressurized fluid source.

5. The running tool of claim 4, wherein the pressurized fluid source communicates to the nozzles via a passage, a fluid line, the lift arm, and drill pipe, where the passage is formed in the body, the fluid line connects the passage to an annulus in the lift arm, and the lift arm annulus openly communicates to an annulus in the drill pipe.

6. The running tool of claim 1, wherein the offset member comprises an elongate side disposed substantially perpendicular to the body axis and lift arm attachment locations along the elongate side.

7. A running tool for subsea attachment to a subsea wellhead member, the tool comprising:

a tool body configured for insertion into a main bore of the subsea wellhead member, the tool body having an axis aligned with the bore axis;

a subsea wellhead member latching device attached to the tool body;

an elongate offset member attached to the tool body and oriented with its elongate side substantially perpendicular to the tool body axis; and

a lift arm mechanically coupled to the offset member selectively positioned along the elongate side of the member based on the center of gravity of the running tool and the subsea wellhead member.

8. The running tool of claim 7, further comprising a subsea wellhead member pressure testing system, the pressure testing system disposable into the subsea wellhead member.

9. The running tool of claim 7, further comprising a hydraulic port adapted to receive a fluid supply line, a fluid line between the hydraulic port and the latching device, and a valve disposed in the line operable for selective fluid communication between the hydraulic port and the latching device.

10. The running tool of claim 7, wherein the lift arm axis coincides with the center of gravity of the subsea wellhead member and the running tool.

11. A method of handling a subsea wellhead member comprising:

providing a running tool having a body with an axis, a wellhead member latch on the body, an offset member attached to the body, and a lift arm attached to the offset member;

estimating an offset distance from the tool body axis to where the lift arm is attached to the offset member, where attaching the lift arm an offset distance from the tool body axis

compensates for asymmetric weight distribution of the subsea wellhead member about its axis;

selectively positioning the lift arm on the offset member a distance away from the axis substantially equal to the offset difference;

attaching the running tool to the subsea wellhead member; and

manipulating the running tool thereby moving the subsea wellhead member with respect to a subsea well to conduct a subsea wellbore operation.

12. The method of claim 11, further comprising pressure testing the subsea wellhead member.

13. The method of claim 11, wherein the wellhead member latch comprises a dog configured for mating attachment with a profile in a bore of the wellhead member, the dog hydraulically extendable from the tool body and wherein step of attaching the running tool comprises hydraulically activating the dog to extend from the tool body into mating attachment with the profile.

14. The method of claim 13 further comprising deploying a remotely operated vehicle (ROV) proximate to the running tool and applying pressurized hydraulic fluid to the running tool from the ROV for activating the wellhead member latch.

15. The method of claim 14, wherein the lift arm axis coincides with the center of gravity of the combined running tool and subsea wellhead member.

What is claimed is:

1. A running tool for handling a subsea wellhead member, the running tool comprising:

a tool body having an axis, a fluid passage therethrough with an outlet on a lower portion of the body;

a latch on the tool body above the outlet, the latch having an engaged position for engagement with a profile within a bore of the subsea wellhead member and a released position for releasing from the profile;

an offset arm on the tool body having an elongate side oriented transverse to the axis of the tool body;

a lift arm affixed to the offset arm at a selective distance from the axis of the tool body, the lift arm having an upper end adapted to be secured to a string of pipe; and

a fluid passage extending lengthwise through the lift arm and in fluid communication with the fluid passage in the tool body for flowing fluid pumped down the string of pipe into the bore of the subsea wellhead member.

2. The running tool of claim 1, further comprising:

a hydraulic fluid pressure system for moving the latch between the engaged and released positions;

a hydraulic stab receptacle mounted to the running tool for receiving hydraulic fluid pressure from a remotely operated vehicle (ROV) to operate the hydraulic fluid pressure system.

3. The running tool of claim 2, further comprising:

a lock valve assembly in fluid communication with the stab receptacle and having a fitting for manual manipulation by the ROV; and

a release valve assembly in fluid communication with the stab receptacle and having a fitting for manual manipulation by the ROV.

4. The running tool of claim **1**, further comprising a plurality of weights selectively mounted on the lift arm offset from the axis of the body and offset from an axis of the lift arm to provide balancing of the running tool.

5. The running tool of claim **1**, wherein the outlet of the fluid passage in the body comprises a plurality of flow nozzles.

6. The running tool of claim **1**, wherein the fluid passage in the lift arm communicates with the fluid passage in the body via an external fluid line extending between the lift arm and the body.

7. The running tool of claim **1**, wherein:

the offset arm extends on both sides of the axis of the tool body; and

bolt holes are formed through the offset arm on both sides of the axis of the tool body for selectively attaching the lift arm to the offset arm.

8. A running tool for subsea attachment to a subsea wellhead member, the tool comprising:

a tool body configured for insertion into a main bore of the subsea wellhead member, the tool body having an axis aligned with an axis of the bore;

a hydraulically actuated subsea wellhead member latching device attached to the tool body for engaging a mating profile in a body of the subsea wellhead member, the latching device being outwardly movable relative to the tool body to an engaged position and inwardly movable relative to the tool body to a released position;

a hot stab receptacle mounted to the running tool for engagement by a remote operated vehicle (ROV) to supply hydraulic fluid pressure for moving the latching device between the engaged and released positions;

an elongate offset member attached to the tool body and oriented so than an elongate side of the offset member is substantially perpendicular to the tool body axis;

a lift arm mechanically coupled to the offset member selectively positioned along the elongate side of the member based on the center of gravity of the running tool and the subsea wellhead member, the lift arm having a threaded upper end for connection to a string of pipe;

a fluid passage extending lengthwise through the lift arm for receiving fluid pumped down the string of pipe;

a fluid passage extending axially through the body and having an outlet in a lower portion of the body; and

an external fluid line connecting the fluid passage in the lift arm with the fluid passage in the body for conveying fluid pumped down the string of pipe to the outlet.

9. The running tool of claim **8**, further comprising:

a lock valve assembly in fluid communication with the stab receptacle and having a fitting for manual manipulation by the ROV; and

a release valve assembly in fluid communication with the stab receptacle and having fitting for manual manipulation by the ROV.

10. The running tool of claim **8**, further comprising:

a plurality of weights selectively mounted on the lift arm offset from the axis of the body and offset from an axis of the lift arm to provide balancing of the running tool.

11. The running tool of claim **8**, wherein the outlet of the fluid passage in the body comprises a plurality of flow nozzles.

12. The running tool of claim **8**, wherein the offset arm extends on both sides of the axis of the tool body; and

the lift arm is selectively attachable to the offset arm on both sides of the axis of the tool body.

13. A method of handling a subsea wellhead member comprising:

providing a running tool having a body with an axis, a wellhead member latch on the body, fluid passage in the body with a fluid outlet on the body below the latch, an elongated offset arm attached to the body in an orientation transverse to the axis of the body, and a lift arm attached to the offset arm, the lift arm having a fluid passage therein in fluid communication with the fluid passage in the body;

selectively positioning the lift arm at a location on the offset arm offset from the axis of the body;

attaching the running tool to the subsea wellhead member by inserting at least a portion of the body into a bore of the wellhead member and actuating the latch;

connecting a string of pipe to the lift arm and lowering the running tool and wellhead member onto a subsea well assembly;

connecting the wellhead member to the subsea well assembly; and

pumping fluid down the string of pipe, through the passages in the lift arm and the body and out the outlet into the wellhead member.

14. The method of claim **13**, wherein pumping fluid down the string of pipe comprises pressure testing the subsea wellhead member.

15. The method of claim **13**, wherein the wellhead member latch comprises a locking member configured for mating attachment with a profile in the bore of the wellhead member, the locking member hydraulically extendable from the tool body and wherein the step of attaching the running tool comprises hydraulically activating the locking member to extend from the tool body into mating attachment with the profile.

16. The method of claim **15** further comprising deploying a remotely operated vehicle (ROV) proximate to the running tool and applying pressurized hydraulic fluid to the running tool from the ROV for activating the wellhead member latch.

17. The method of claim **13**, further comprises mounting weights to the running tool offset from an axis of the lift arm to coincide the lift arm axis with the center of gravity of the combined running tool and subsea wellhead member.

18. The method of claim **13**, wherein pumping fluid down the string of pipe is performed before connecting the running tool to the subsea wellhead member to clear debris from the subsea wellhead member.