Additionally, enhanced oil recovery techniques (e.g., steam injection) can also be used to promote well production.

SUMMARY

[0005] Certain aspects of some embodiments disclosed herein are set forth below. It should be understood that these aspects are presented merely to provide the reader with a brief summary of certain forms the invention might take and that these aspects are not intended to limit the scope of the invention. Indeed, the invention may encompass a variety of aspects that may not be set forth below.

[0006] Examples of the present disclosure generally relate to suspending a sucker-rod string within a well. In some examples, a hang-off sub is coupled to a sucker-rod string. The hang-off sub can be positioned within a blowout preventer and aligned to allow hang-off rams of the blowout preventer to engage the hang-off sub. The engaged hang-off rams support the hang-off sub, allowing the sucker-rod string to be suspended within the well from the hang-off sub. In at least one examples, the sucker-rod string is threaded to a lower end of the hang-off sub. A crossover can be threaded to an upper end of the hang-off sub to facilitate installation and removal of the hang-off sub from the blowout preventer while attached to the sucker-rod string. With the sucker-rod string suspended in the well from the hang-off sub, the well can be shut in and steam can be injected into the well without using sealing rams or a stuffing box.

[0006A] According to a first aspect, there is provided a system comprising: a blowout preventer; a hang-off ram installed in the blowout preventer; a hang-off sub sized to fit within a bore of the blowout preventer; and a sucker-rod string coupled to the hang-off sub and to a downhole pump; wherein the hang-off ram and the hang-off sub have complementary surfaces that enable the hang-off ram to engage the hang-off sub within the blowout preventer to facilitate suspension of the sucker-rod string in a well from the hang-off sub, wherein the complementary surfaces include an external recess in the hang-off sub for receiving the hang-off ram.

[0006B] According to a second aspect, there is provided a system comprising: a wellhead assembly including a blowout preventer installed at a well; a sucker-rod string positioned within the well and coupled to a downhole pump within the well; and a hang-off

sub coupled to the sucker-rod string and supported by the blowout preventer such that the sucker-rod string is suspended from the hang-off sub and such that the hang-off sub is secured in place within the blowout preventer so as to inhibit both upward axial movement and downward axial movement of the hang-off sub and the sucker-rod string.

[0006C] According to a third aspect, there is provided a method comprising: closing rams of a blowout preventer of a wellhead assembly to engage a rod string extending into a well from the blowout preventer, wherein closing rams of the blowout preventer of the wellhead assembly to engage the rod string includes closing rams of the blowout preventer of the wellhead assembly to engage an external recess of a hang-off sub of the rod string; suspending the rod string in the well from the rams such that the rams of the blowout preventer support the weight of the rod string; sealing the wellhead assembly to enclose an entirety of a top end of the suspended rod string within the wellhead assembly; unsealing the wellhead assembly to permit access to the top end of the rod string; and coupling a polished rod to the rod string after unsealing the wellhead assembly to permit access to the top end of the rod string.

[0007] Various refinements of the features noted above may exist in relation to various aspects of the present embodiments. Further features may also be incorporated in these various aspects as well. These refinements and additional features may exist individually or in any combination. For instance, various features discussed below in relation to one or more of the illustrated embodiments may be incorporated into any of the above-described aspects of the present disclosure alone or in any combination. Again, the brief summary presented above is intended only to familiarize the reader with certain aspects and contexts of some embodiments without limitation to the claimed subject matter.

CLAIMS

1. A system comprising:

a blowout preventer;

a hang-off ram installed in the blowout preventer;

a hang-off sub sized to fit within a bore of the blowout preventer; and

a sucker-rod string coupled to the hang-off sub and to a downhole pump;

wherein the hang-off ram and the hang-off sub have complementary surfaces that enable the hang-off ram to engage the hang-off sub within the blowout preventer to facilitate suspension of the sucker-rod string in a well from the hang-off sub, wherein the complementary surfaces include an external recess in the hang-off sub for receiving the hang-off ram.

2. The system of claim 1, wherein the external recess in the hang-off sub includes a circumferential groove about the exterior of the hang-off sub for receiving multiple hang-off rams.

3. The system of claim 1, wherein the external recess in the hang-off sub includes opposing surfaces that complement the hang-off ram and inhibit axial movement of the hang-off sub in two opposite directions when engaged by the hang-off ram within the blowout preventer.

4. The system of claim 1, comprising a crossover to facilitate installation and removal of the hang-off sub from the blowout preventer.

5. The system of claim 4, wherein the crossover includes a threaded pin end to engage a threaded recess of the hang-off sub and a threaded box end to receive a sucker-rod joint or a polished rod.

6. The system of claim 1, wherein the blowout preventer includes a rotatable threaded rod that enables manual actuation of the hang-off ram within the blowout preventer.

7. The system of claim 1, wherein the sucker-rod string is threaded to the hang-off sub.

8. A system comprising:

a wellhead assembly including a blowout preventer installed at a well;

a sucker-rod string positioned within the well and coupled to a downhole pump within the well; and

a hang-off sub coupled to the sucker-rod string and supported by the blowout preventer such that the sucker-rod string is suspended from the hang-off sub and such that the hang-off sub is secured in place within the blowout preventer so as to inhibit both upward axial movement and downward axial movement of the hang-off sub and the sucker-rod string.

9. The system of claim 8, wherein the blowout preventer includes a pair of hang-off rams that engage and support the hang-off sub within the blowout preventer.

10. The system of claim 8, wherein the wellhead assembly includes a valve connected to the blowout preventer such that the blowout preventer is positioned between the valve and the wellhead.

11. A method comprising:

closing rams of a blowout preventer of a wellhead assembly to engage a rod string extending into a well from the blowout preventer, wherein closing rams of the blowout preventer of the wellhead assembly to engage the rod string includes closing rams of the blowout preventer of the wellhead assembly to engage an external recess of a hang-off sub of the rod string;

suspending the rod string in the well from the rams such that the rams of the blowout preventer support the weight of the rod string;

sealing the wellhead assembly to enclose an entirety of a top end of the suspended rod string within the wellhead assembly;

unsealing the wellhead assembly to permit access to the top end of the rod string; and

coupling a polished rod to the rod string after unsealing the wellhead assembly to permit access to the top end of the rod string.

12. The method of claim 11, comprising coupling the hang-off sub having the external recess to a sucker rod of the rod string.

13. The method of claim 12, comprising, after unsealing the wellhead assembly to permit access to the rod string:

opening the rams of the blowout preventer;

pulling the hang-off sub out of the blowout preventer;

disconnecting the hang-off sub from the sucker rod; and

coupling the polished rod to the sucker rod.

14. The method of claim 13, comprising coupling a crossover to the hang-off sub to facilitate pulling of the hang-off sub out of the blowout preventer.

15. The method of claim 11, comprising injecting steam into the well while the rod string is suspended in the well from the rams.