SUMMARY

In this disclosure, systems and methods are provided which bring improvements to the arts of constructing and operating packers and safety joints. One example is described below in which activation of the safety joint deactivates (prevents setting of) the packer. Another example is described below in which a drag block on the packer is secured against displacement in at least one direction relative to a mandrel of the packer, in response to activation of the safety joint.

A packer deactivation system is described below. In one example, the system can include a packer and a safety joint. Activation of the safety joint prevents setting of the packer.

A method for use with a subterranean well is also described below. One example of the method can include activating a safety joint in the well; and deactivating a packer connected to the safety joint, in response to the safety joint activating.

Another packer deactivation system described below can include a safety joint and a packer drag block locking mechanism. Activation of the safety joint operates the drag block locking mechanism, thereby preventing a drag block from displacing in a certain direction relative to a mandrel of a packer.

According to a first aspect of the invention, there is provided a packer deactivation system for use with a subterranean well, comprising: a packer including a generally tubular mandrel, a set of slips, a drag block, and a sealing element, wherein the packer is positioned on a

first section of a tubular string; and a safety joint, wherein activation of the safety joint disconnects the first section from a second section of the tubular string, wherein activation of the safety joint prevents displacement of the drag block in at least one direction relative to the mandrel, thereby preventing the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

According to a second aspect of the invention, there is provided a packer deactivation system, comprising: a packer; and a safety joint, wherein activation of the safety joint disconnects sections of a tubular string, wherein the activation of the safety joint prevents setting of the packer, and wherein a chamber is exposed to pressure in a wellbore in response to the activation of the safety joint.

According to a third aspect of the invention, there is provided a packer deactivation system for use with a subterranean well, comprising: a packer including a set of slips and a sealing element, wherein the packer is positioned on a first section of a tubular string; and a safety joint, wherein activation of the safety joint disconnects the first section from a second section of the tubular string, wherein activation of the safety joint engages a drag block locking mechanism which prevents the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

According to a fourth aspect of the invention, there is provided a method for use with a subterranean well, the method comprising: activating a safety joint in the well, wherein activation of the safety joint disconnects a first section of a tubular string from a second section of the

tubular string, and wherein activating the safety joint further comprises applying a predetermined tensile load to the safety joint, thereby displacing a mandrel of the safety joint in a direction relative to an outer housing of the safety joint; and in response to the safety joint activating, deactivating a packer positioned on the first section of the tubular string, the packer including a set of slips and a sealing element, wherein deactivating the packer further comprises preventing the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

According to a fifth aspect of the invention, there is provided a method for use with a subterranean well, the method comprising: activating a safety joint in the well, wherein activation of the safety joint disconnects sections of a tubular string; deactivating a packer connected to the safety joint, in response to the safety joint activating; and exposing a chamber to pressure in the well in response to the safety joint activating.

According to a sixth aspect of the invention, there is provided a method for use with a subterranean well, the method comprising: activating a safety joint in the well, wherein activation of the safety joint disconnects a first section of a tubular string from a second section of the tubular string; and in response to the safety joint activating, deactivating a packer positioned on the first section of the tubular string, the packer including a set of slips and a sealing element, wherein activating the safety joint further comprises engaging a drag block locking mechanism which prevents the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

According to a seventh aspect of the invention, there is provided a packer deactivation system for use with a subterranean well, comprising: a packer including a generally tubular mandrel, a set of slips, a drag block, and a sealing element, wherein the packer is positioned on a first section of a tubular string; a safety joint; and a packer drag block locking mechanism which prevents the drag block from displacing in a direction relative to the mandrel, wherein activation of the safety joint disconnects the first section from a second section of the tubular string, and wherein activation of the safety joint operates the packer drag block locking mechanism, thereby preventing the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

These and other features, advantages and benefits will become apparent to one of ordinary skill in the art upon careful consideration of the detailed description of representative embodiments of the disclosure hereinbelow and the accompanying drawings, in which similar elements are

WHAT IS CLAIMED IS:

1. A packer deactivation system, comprising:

a packer; and

a safety joint,

wherein activation of the safety joint prevents setting of the packer.

2. The system of claim 1, wherein activation of the safety joint disconnects sections of a tubular string.

3. The system of claim 1, wherein activation of the safety joint prevents displacement of a drag block of the packer in at least one direction relative to a mandrel of the packer.

4. The system of claim 1, wherein activation of the safety joint exposes a chamber to pressure in a wellbore.

5. The system of claim 1, wherein activation of the safety joint engages a drag block locking mechanism.

6. The system of claim 1, wherein activation of the safety joint engages a collet, thereby preventing setting of the packer.

7. The system of claim 1, wherein activation of the safety joint engages a gripping device, thereby preventing

displacement of a drag block of the packer in at least one direction relative to a mandrel of the packer.

8. A method for use with a subterranean well, the method comprising:

activating a safety joint in the well; and

deactivating a packer connected to the safety joint, in response to the safety joint activating.

9. The method of claim 8, wherein activating the safety joint further comprises disconnecting sections of a tubular string.

10. The method of claim 8, wherein activating the safety joint further comprises applying a predetermined tensile load to the safety joint, thereby displacing a mandrel of the safety joint in a direction relative to an outer housing of the safety joint.

11. The method of claim 10, wherein deactivating the packer further comprises preventing a drag block of the packer from displacing in the direction relative to a mandrel of the packer.

12. The method of claim 11, wherein preventing the drag block from displacing in the direction is performed in response to displacing the safety joint mandrel in the direction.

13. The method of claim 8, wherein activating the safety joint further comprises exposing a chamber to pressure in the well.

14. The method of claim 8, wherein activating the safety joint further comprises engaging a drag block locking mechanism.

15. The method of claim 8, wherein activating the safety joint further comprises engaging a collet, thereby preventing setting of the packer.

16. The method of claim 8, wherein activating the safety joint further comprises engages a gripping device, thereby preventing displacement of a drag block of the packer in at least one direction relative to a mandrel of the packer.

17. The method of claim 8, further comprising setting the packer prior to activating the safety joint.

18. A packer deactivation system, comprising:

a safety joint; and

a packer drag block locking mechanism,

wherein activation of the safety joint operates the drag block locking mechanism, thereby preventing a drag block from displacing in a direction relative to a mandrel of a packer.

19. The system of claim 18, wherein activation of the safety joint disconnects sections of a tubular string.

20. The system of claim 18, wherein activation of the safety joint exposes a chamber to pressure in a wellbore.

21. The system of claim 18, wherein the drag block locking mechanism comprises a collet, and wherein activation of the safety joint engages the collet, thereby preventing the drag block from displacing in the direction relative to the mandrel.

22. The system of claim 18, wherein the drag block locking mechanism comprises a gripping device, and wherein activation of the safety joint engages the gripping device, thereby preventing the drag block from displacing in the direction relative to the mandrel.

WHAT IS CLAIMED IS:

1. A packer deactivation system for use with a subterranean well, comprising:

a packer including a generally tubular mandrel, a set of slips, a drag block, and a sealing element, wherein the packer is positioned on a first section of a tubular string; and

a safety joint, wherein activation of the safety joint disconnects the first section from a second section of the tubular string, wherein activation of the safety joint prevents displacement of the drag block in at least one direction relative to the mandrel, thereby preventing the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

2. A packer deactivation system, comprising:

a packer; and

a safety joint, wherein activation of the safety joint disconnects sections of a tubular string, wherein the activation of the safety joint prevents setting of the packer, and wherein a chamber is exposed to pressure in a wellbore in response to the activation of the safety joint.

3. A packer deactivation system for use with a subterranean well, comprising:

a packer including a set of slips and a sealing element, wherein the packer is positioned on a first section of a tubular string; and

a safety joint, wherein activation of the safety joint disconnects the first section from a second section of the tubular string, wherein activation of the safety joint engages a drag block locking mechanism which prevents the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

4. A method for use with a subterranean well, the method comprising:

activating a safety joint in the well, wherein activation of the safety joint disconnects a first section of a tubular string from a second section of the tubular string, and wherein activating the safety joint further comprises applying a predetermined tensile load to the safety joint, thereby displacing a mandrel of the safety joint in a direction relative to an outer housing of the safety joint; and

in response to the safety joint activating, deactivating a packer positioned on the first section of the tubular string, the packer including a set of slips and a sealing element, wherein deactivating

the packer further comprises preventing the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

5. The method of claim 4, wherein deactivating the packer further comprises preventing a drag block of the packer from displacing in the direction relative to a mandrel of the packer.

6. The method of claim 5, wherein preventing the drag block from displacing in the direction is performed in response to displacing the safety joint mandrel in the direction.

7. A method for use with a subterranean well, the method comprising:
activating a safety joint in the well, wherein activation of the safety joint disconnects sections of a tubular string;
deactivating a packer connected to the safety joint, in response to the safety joint activating; and
exposing a chamber to pressure in the well in response to the safety joint activating.

8. A method for use with a subterranean well, the method comprising:
activating a safety joint in the well, wherein activation of the safety joint disconnects a first section of a tubular string from a second section of the tubular string; and
in response to the safety joint activating, deactivating a packer positioned on the first section of the tubular string, the packer including a set of slips and a sealing element, wherein activating the safety joint further comprises engaging a drag block locking mechanism which prevents the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

9. A packer deactivation system for use with a subterranean well, comprising:
a packer including a generally tubular mandrel, a set of slips, a drag block, and a sealing element, wherein the packer is positioned on a first section of a tubular string;
a safety joint; and
a packer drag block locking mechanism which prevents the drag block from displacing in a direction relative to the mandrel, wherein activation of the safety joint disconnects the first section from a second section of the tubular string, and wherein activation of the safety joint operates the packer drag block locking mechanism, thereby preventing the slips and the sealing element from setting during concurrent removal of the packer and the first section of the tubular string from the well.

10. The system of claim 9, wherein activation of the safety joint exposes a chamber to pressure in a wellbore.

11. The system of claim 9, wherein the drag block locking mechanism comprises a collet, and wherein activation of the safety joint engages the collet, thereby preventing the drag block from displacing in the direction relative to the mandrel.

12. The system of claim 9, wherein the drag block locking mechanism comprises a gripping device, and wherein activation of the safety joint engages the gripping device, thereby preventing the drag block from displacing in the direction relative to the mandrel.