SHEARABLE RISER JOINT

This invention relates to a shearable riser joint, the joint being shearable by the shear ram of a blow-out preventer (BOP), a lower part of the joint being arranged to be coupled, in use, to a column hoist running tool and an upper part being arranged, in use, to be coupled to a riser column. The invention may additionally relate to a recovery tool for use in releasing, for removal, the column hoist running tool after the shear cutting of the riser joint by the ram of the blow-out preventer.

In the case of a loss of position of a completion dynamic positioning rig (for example, a ship or semi-submersible), or in adverse sea conditions, it is necessary to be able to effect a disconnection from the Lower Marine Riser Package (LMRP) of the blow-out preventer in less than thirty seconds. In a standard emergency procedure, this disconnection is preceded automatically by closing of the shear ram of the blow-out preventer. This shear ram should be capable of cutting the column in front of it to allow safe abandonment of the well.

During the completion phase, the most critical operation is the seating of the column hoist, during which a completion riser joint will be positioned in front of the shear ram. However, there is no guarantee that the shear ram will be able to cut the completion riser joint because, by norm (API 16A), the shear ram should cut drill pipes of 19.5lb/ft, grade "E" or "G", and not necessarily pipelines of larger diameters or weights.

According to one aspect of the present invention there is provided a shearable riser joint, said joint being shearable by the shear ram of a blow-out preventer, a lower part of the joint being arranged to be coupled, in use, to a column hoist running tool and an upper part being arranged, in use, to be coupled to a riser column.

Advantageously, the joint comprises, at an upper

region, a riser bolt having a lower portion connected to an access pipe to a production column, said access pipe being shearable by the shear ram of the blow-out preventer and containing internally hydraulic lines for use in actuating the column hoist running tool, the shearable access pipe being connected at a lower region to a re-entry mandrel that is, in turn, connected to a riser box at the top end of the column hoist running tool. The re-entry mandrel is lockable with a recovery tool so as to allow the re-establishment of hydraulic continuity for unlocking of the hoist prior to its subsequent removal.

According to a further aspect of the present invention there is provided a recovery tool for use in releasing, for removal, the column hoist running tool after the shear cutting of the riser joint by the ram of the blow-out preventer.

Advantageously, an upper portion of the recovery tool comprises a jacket for receiving the sheared pipe, enabling access to be made to the re-entry mandrel, and a lower portion of the recovery tool may be provided with an hydraulic connector for locking to the re-entry mandrel to allow for unlocking of the column hoist running tool prior to its subsequent removal. Preferably the jacket of the recovery tool is provided with apertures to facilitate its cutting by the blow-out preventer in the event of, for example, loss of position during fishing.

According to a third aspect of the present invention there is provided a combination of a shearable riser joint in accordance with said one aspect of the invention, with a recovery tool in accordance with said further aspect of the present invention.

An embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Figures 1A and 1B are sections showing an embodiment of shearable completion riser joint in accordance with the

present invention and positioned inside a blow-out preventer;

Figures 2A and 2B are sections showing an embodiment of recovery tool in accordance with the present invention coupled to the shearable completion riser joint of Figures 1A and 1B after its cutting by the blow-out preventer.

Figure 3 is an enlarged section across the line A-A of Figure 1A;

Figure 4 is an enlarged section across the line B-B in Figure 2A; and

Figure 5 is a schematic view of the hydraulics of the re-entry mandrel of the shearing completion riser joint of Figures 1A and 1B.

The completion riser joint 1 shown in Figures 1A, 1B, 3 and 5 is shearable by the shear ram of the blow-out preventer 2. The joint is to be coupled, at its lower part, to a column hoist running tool and, at its upper part to a completion riser column. The joint comprises, at its upper end, a riser bolt 3 connected at its lower portion to access pipe 4 to the production column. The access pipe 4 is shearable by the shear ram of the blow-out preventer 2 and contains internally hydraulic lines 5 of ½" (0.0127m) diameter and hydraulic lines 6 of 3/8" (0.0095m) diameter. These lines are positioned within an external protector 7 and allow for actuation of the column hoist running tool. The lower part of the pipe 4 is connected to a re-entry mandrel 8 whose function is to allow for locking of a recovery tool and, through it, allow for the establishment of a hydraulic connection for actuating the unlocking means of the column hoist and its subsequent release. Below the re-entry mandrel 8 is a riser box 9 for positioning above the column hoist running tool.

Figure 5 illustrates schematically a hydraulic arrangement for the re-entry mandrel 8 of the shearing completion riser joint 1. Reference numeral 10 denotes a surface panel and reference numeral 11 denotes un/locking

means.

A release tool 12 is provided to allow the release, for removal, of the column hoist running tool after the cutting of the shearable joint 1 by the ram of the blow-out preventer 2. As shown in Figures 2A and 2B, which show the recovery tool 12 coupled to the sheared completion riser joint 1, as well as from Figure 4, the upper part of the recovery tool 12 comprises a fishing jacket 13. The function of this fishing jacket 13 is to allow the jacketing of the sheared pipe 4 and, consequently, to provide access to the re-entry mandrel 8. The fishing jacket 13 is apertured to facilitate its cutting by the blow-out preventer 2 should a loss of position occur during fishing. The lower portion of the recovery tool 12 includes a hydraulic connector 14 for locking with the re-entry mandrel 8 to provide access to means for unlocking the column hoist running tool before it can be removed.

CLAIMS

1. A shearable riser joint, said joint being shearable by the shear ram of a blow-out preventer, a lower part of the joint being arranged to be coupled, in use, to a column hoist running tool and an upper part being arranged, in use, to be coupled to a riser column.

2. A joint as claimed in claim 1, comprising, at an upper region, a riser bolt having a lower portion connected to an access pipe to a production column, said access pipe being shearable by the shear ram of the blow-out preventer and containing internally hydraulic lines with an external protector for use in actuating the column hoist running tool, the shearable access pipe being connected at a lower region to a re-entry mandrel that is, in turn, connected to a riser box at the top end of the column hoist running tool.

3. A recovery tool for use with the joint of claim 1 or claim 2, said recovery tool being arranged for use in releasing, for removal, the column hoist running tool after the shear cutting of the riser joint by the ram of the blow-out preventer.

4. A recovery tool as claimed in claim 3 for use with the joint of claim 2 only, wherein an upper portion of the recovery tool comprises fishing jacket means for receiving the sheared pipe and a lower portion of the recovery tool is provided with an hydraulic connector for locking to the re-entry mandrel to allow for unlocking of the column hoist running tool prior to its subsequent removal.

5. A recovery tool as claimed in claim 4, wherein the fishing jacket means of the recovery tool is provided with apertures to facilitate its cutting by the blow-out preventer in the event of loss of position during fishing.

6. A combination of a shearable riser joint as claimed in claim 1 or claim 2 with a recovery tool as

claimed in any of claims 3 to 5.

7. A shearable completion riser joint substantially as described herein with reference to the accompanying drawings.

8. A recovery tool substantially as described herein with reference to the accompanying drawings.