Description

This invention relates to the formation of drilling wells which are used in the extraction of fuel such as oil or gas.

In the formation of well bores a wellhead is secured in position and a bore is drilled below that wellhead by passing a drill through a bore in the wellhead. The wellhead may be on land, on a platform above sea level or on the seabed. In order to avoid damage to the wall which defines the bore in the wellhead when the drill is passed through it, it is usual to locate within the wellhead a wear bushing which acts to protect the wall of the bore. This is important since the wall of the wellhead bore is later required to act as a sealing surface against elements which locate within that bore. In order to accommodate the drill which is used to carry out the drilling, the bore in the wellhead has to have a certain minimum diameter.

Once the bore has been drilled, the drill is removed and casing strings and casing hangers are subsequently lowered into the bore by passing them through the wellhead bore. These are usually supported from a casing hanger which rests upon a shoulder formed in the wall of the wellhead bore. Because of the relative diameters which conventionally have been used, it has not been possible to leave the wear bushing in place when the casings and casing hangers have been lowered into the well bore. This has meant that the sealing surface of the wellhead bore can be damaged as the casings and casing hangers are passed through that bore. With the increasing use of metal-to-metal seals which are being used in this type of equipment it is becoming more important to ensure that the sealing surface remains undamaged so that effective metal-to-metal seals can be acheived. There is therefore a requirement for an arrangement in which the wear bushing can be retained in position against the sealing surface of the wellhead bore whilst casings and casing hangers, tubing and tubing hangers and other equipment are run into the wellbore.

GB-A-2193519 discloses a wellhead having a bore incorporating a generally tubular element having an external shoulder which lands on a shoulder of the wall of the bore, and an internal shoulder providing a landing shoulder for elements which are run into the bore; and according to a first aspect of the present invention, such a wellhead is characterised by a bore protector positioned above the tubular element having a central bore which is sufficiently large to allow the elements which are run into the bore to pass through the central bore so that the protector can be maintained in its operative position during the running of the elements to protect the sealing surface of the wellhead bore.

GB-A-2193519 also discloses a method of forming a well bore which includes the step of locating within a wellhead housing a tubular element having an external shoulder and an internal shoulder providing a landing shoulder for elements which are run into the bore, so that the external shoulder lands upon a shoulder of the wall of the bore; and according to a second aspect of the present invention, such a method is characterized by protecting the sealing surface of the wellhead housing bore whilst the elements (25) which are run into the bore, such as casing and tubing strings are run through the wellhead.

Such a wellhead and method allow the diameter of the casing hangers to be reduced so that they can pass through the internal diameter of a wear bushing within the wellhead bore. Thus it is possible with such an arrangement to maintain the wear bushing in place against the sealing surface of the wellhead bore while the casing and casing hangers are run. This therefore acts as protection for the sealing surface on the wellhead bore.

The invention will be described now by way of example only, with particular reference to the accompanying drawing. The drawing is a sectional view of a wellhead housing incorporating a tubular element in accordance with the present invention.

Referring to the drawing there is shown a generally tubular wellhead housing (10) which has a through bore (11). The upper part of the wellhead bore (11) accommodates a generally tubular wear bushing (12) which has been landed upon a shoulder (14) formed in the wall of the wellhead bore. As will be apparent to those skilled in the art the wear bushing (12) is provided to protect the sealing surface (15) of the wellhead bore from damage as elements are passed through the wellhead bore.

Disposed below the wear bushing is a generally tubular element (20) which comprises a lower tubular part (21) and an upper tubular part (22) of slightly greater diameter with a shoulder (23) formed therebetween. The exterior of the shoulder (23) rests upon a shoulder (24) formed in the wall of the wellhead bore. The internal part of the shoulder (23) has landed thereon a correspondingly shaped shoulder formed on the exterior of a casing hanger (25). As will be apparent to those skilled in the art the casing hanger is lowered into the position shown in the drawing by means of a casing hanger running tool which is illustrated at (26). The casing hanger (25) is used to support casing strings which are run into the well bore and suspended from the casing hanger.

Prior to formation of the well bore below the wellhead housing (10), it will be appreciated that the tubular element (20) is not in position within the wellhead to allow clearance for a drill bit. The wear

bushing (12) is lowered into the position shown in the drawing by means of a wear bushing running tool. A drill bit is then lowered on a drill pipe so that it passes through the wellhead bore, the sealing surface (15) of the bore being protected during such operation by the wear bushing (12). The well bore is then drilled in a manner which will be apparent to those skilled in the art.

Once the well bore has been drilled the drill is withdrawn to the surface and the wear bushing (15) is retrieved using the wear bushing running tool. Next the tubular member (20) is lowered into the position shown in the drawing using an appropriate running tool. The tubular member (20) is held in place in the wellhead housing by annular seals (28). The running tool is then recovered and the wear bushing (12) is then lowered into position again using the wear bushing running tool. After this step has been carried out casing strings are then run into the well bore. The casing hanger (25) is attached to the casing string and lowered using the casing hanger running tool (26) to the position shown in the drawing in a manner which will be apparent to those skilled in the art.

By providing the tubular member (20) which acts as a false bowl it is possible to employ a casing hanger (25) of slightly reduced diameter relative to one which has to rest upon the shoulder (24). This means that it is possible to use a casing hanger (25) which can pass through the central bore of the wear bushing (15). Hence the wear bushing (15) can be retained in position during the steps of lowering the casing strings into position. Thus the sealing surface of the well bore is protected during this operation and should not be damaged and thereby assist in maintaining a good surface for subsequent metal-to-metal seals which are provided within the wellhead bore.

Claims

1. A wellhead having a bore incorporating a generally tubular element (20) having an external shoulder which lands on a shoulder of the wall of the bore, and an internal shoulder providing a landing shoulder for elements (25) which are run into the bore; characterized by a bore protector (12) positioned above the tubular element (20) having a central bore which is sufficiently large to allow the elements (25) which are run into the bore to pass through the central bore so that the protector can be maintained in its operative position during the running of the elements to protect the sealing surface of the wellhead bore.

2. A wellhead according to claim 1, wherein the tubular element (20) is of generally uniform wall thickness, and the element having two coaxial tubular portions (21,22) axially displaced from one another, the upper one (22) being of a diameter slightly greater than the lower one (21), and the internal and external shoulder being formed between the two portions.

3. A method of forming a well bore (11) which includes the step of locating within a wellhead housing a tubular element (20) having an external shoulder and an internal shoulder providing a landing shoulder for elements (25) which are run into the bore (11), so that the external shoulder lands upon a shoulder (24) of the wall of the bore; and characterised by protecting the sealing surface of the wellhead housing bore whilst the elements (25) which are run into the bore, such as casing and tubing strings are run through the wellhead.

Patentansprüche

1. Bohrlochkopf mit einer Bohrung, der ein im wesentlichen rohrförmiges Element (20) mit einer äußeren Schulter umfaßt, welche auf einer Schulter der Bohrungswand aufsetzt, und einer inneren Schulter, die als Setzschulter für Elemente (25) dient, welche durch die Bohrung hindurchbewegt werden, **gekennzeichnet durch** eine Bohrungsschutzeinrichtung (12), die oberhalb des rohrförmigen Elementes (20) angeordnet ist und eine zentrische Bohrung aufweist, welche genügend groß ist, um es den Elementen (25), welche durch die Bohrung hindurchbewegt werden, ermöglicht, die zentrische Bohrung zu passieren, so daß die Schutzeinrichtung während des Hindurchbewegens der Elemente in ihrer funktionellen Lage verbleiben kann, um die Dichtungsfläche der Bohrlochkopfbohrung zu schützen.

2. Bohrlochkopf nach Anspruch 1, **dadurch gekennzeichnet**, daß das rohrförmige Element (20) eine im wesentlichen einheitliche Wanddicke aufweist, und das Element zwei koaxiale rohrförmige Teile (21, 22) umfaßt, die axial voneinander beabstandet sind, wobei der obere Teil (22) im Durchmesser geringfügig größer als der untere Teil (21) ist, und die innere und die äußere Schulter zwischen den beiden Teilen gebildet werden.

3. Verfahren zur Erstellung eines Bohrloches (11), welches den Schritt zur Anordnung eines rohrförmigen Elementes (20) innerhalb eines Bohrlochkopfgehäuses umfaßt, wobei das rohrförmige Element eine äußere Schulter besitzt,

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1. A wellhead having a bore incorporating a generally tubular element (20) having an external shoulder which lands on a shoulder of the wall of the bore, and an internal shoulder providing a landing shoulder for elements (25) which are run into the bore; characterized by a bore protector (12) positioned above the tubular element (20) having a central bore which is sufficiently large to allow the elements (25) which are run into the bore to pass through the central bore so that the protector can be maintained in its operative position during the running of the elements to protect the sealing surface of the wellhead bore.

2. A wellhead according to claim 1, wherein the tubular element (20) is of generally uniform wall thickness, and the element having two coaxial tubular portions (21,22) axially displaced from one another, the upper one (22) being of a diameter slightly greater than the lower one (21), and the internal and external shoulder being formed between the two portions.

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sowie eine innere Schulter, die als Setzschulter für Elemente (25) dient, welche durch die Bohrung (11) hindurchbewegt werden, so daß die äußere Schulter auf einer Schulter (24) von der Bohrungswand aufsetzt, **gekennzeichnet durch** den Schutz der Dichtungsfläche der Bohrung des Bohrlochkopfgehäuses während des Hindurchbewegens der Elemente (25), z. B. der Futterrohr- und Rohrstränge, durch den Bohrlochkopf.

Revendications

1. Tête de puits comportant un alésage comportant un élément généralement tubulaire (20) ayant un épaulement extérieur qui est en appui sur un épaulement de la paroi de l'alésage et un épaulement intérieur fournissant un épaulement d'appui pour des éléments (25) qui sont descendus dans l'alésage; caractérisée en ce qu'un protecteur (12) d'alésage positionné au-dessus de l'élément tubulaire (20) ayant un alésage central qui est suffisamment large pour permettre aux éléments (25) qui sont descendus dans l'alésage de passer à travers l'alésage central de sorte que le protecteur peut être maintenu dans sa position active pendant la descente des éléments pour protéger la surface d'étanchéité de l'alésage de tête de puits.

2. Tête de puits selon la revendication 1, dans laquelle l'élément tubulaire (20) a une épaisseur de paroi généralement uniforme, et l'élément comporte deux parties (21, 22) tubulaires coaxiales décalées axialement l'une par rapport à l'autre, la partie supérieure (22) étant d'un diamètre légèrement plus grand que la partie inférieure (21), et les épaulements intérieur et extérieur étant formés entre les deux parties.

3. Procédé de formation d'un alésage (11) de puits qui comporte l'étape de positionnement dans un boîtier de tête de puits d'un élément tubulaire (20) ayant un épaulement extérieur et un épaulement intérieur fournissant un épaulement d'appui pour des éléments (25) qui sont descendus dans l'alésage (11), de sorte que l'épaulement extérieur soit en appui sur un épaulement (24) de la paroi de l'alésage, et caractérisé en ce qu'il protège la surface d'étanchéité de l'alésage du boîtier de tête de puits lorsque les éléments (25) qui sont descendus dans l'alésage, tels que des lignes de tubes et de tubage sont descendus à travers la tête de puits.