CLAIMS

We Claim:

1. A dual barrier plug system, for use with a wellhead having a first tubular member having a first interior bore, comprising:

a second tubular member, having an upper and a lower end, associated with the first tubular member, the second tubular member having a second interior bore;

a dual barrier plug, having an upper and a lower end, an outer wall surface, a third interior bore, and a valve associated with the lower end of the dual barrier plug, the valve, upon actuation, providing selective fluid flow to the third interior bore of the dual barrier plug, and the dual barrier plug being received within the second interior bore of the second tubular member;

a valve selector member having an upper end and a lower end, and an outer wall surface, the valve selector member being received, and selectively moveable within the third interior bore of the dual barrier plug, the valve selector member including a valve actuator member to actuate the valve associated with the dual barrier plug;

a lower seal associated with the lower end of the dual barrier plug adapted to provide a seal between the outer wall surface of the dual barrier plug and the first interior bore of the first tubular member; and

an upper seal associated with the upper end of the dual barrier plug, disposed between the outer wall surface of the dual barrier plug and the second interior bore of the second tubular member, and disposed between the outer wall surface of the valve selector member and the third interior bore of the dual barrier plug, whereby upward fluid flow from below the lower end of the dual barrier plug may be prevented by the upper and lower seals.

2. The dual barrier plug system of claim 1, wherein the first tubular member is a tubing spool associated with the wellhead

3. The dual barrier plug system of claim 1, wherein the second tubular member is a frac spool.

4. The dual barrier plug system of claim 1, wherein the first tubular member has a first diameter and the second tubular member has a second diameter and the first and second diameters are substantially equal to each other.

5. The dual barrier plug system of claim 1, wherein the second tubular member includes at least one test port in fluid communication with the second interior bore of the second tubular member.

6. The dual barrier plug system of claim 1, wherein the second tubular member includes at least one test port in fluid communication with the third interior bore of the dual barrier plug.

7. The dual barrier plug system of claim 1, including a running tool which moves the dual barrier plug and the valve selector member into the second tubular member, and which moves the valve selector member within the dual barrier plug to open the valve associated with the dual barrier plug.

8. The dual barrier plug system of claim 1, including a plurality of lock-down screws associated with the second tubular member to releasably secure the dual barrier plug within the second tubular member.

9. The dual barrier plug system of claim 1, wherein the upper seal includes a plurality of individual seals.

10. The dual barrier plug system of claim 1, wherein the valve is a poppet valve disposed in the lower end of the dual barrier plug.

11. The dual barrier plug system of claim 1, wherein the dual barrier plug includes at least one fluid passageway in fluid communication between the second interior bore of the second tubular member and the third interior bore of dual barrier plug; and the valve selector member has at least one fluid passageway in selective fluid communication with the at least one fluid passageway of the dual barrier plug, upon relative movement between the dual barrier plug and the valve selector member.

12. A method for providing two barriers to prevent upward fluid flow from a wellhead through a frac tree having a lower master valve and a tubing spool, disposed beneath the lower master valve, the tubing spool having a first interior bore, comprising:

providing a tubular member, having an upper and a lower end and a second interior bore, between the lower master valve and the tubing spool;

disposing a dual barrier plug within the second interior bore of the tubular member;

disposing a valve selector member within the third interior bore of the dual barrier plug, the valve selector member having an upper end and a lower end, and an outer wall surface;

associating a lower seal with the lower end of the dual barrier plug to provide a seal between the outer wall surface of the dual barrier plug and the first interior bore of the tubing spool;

associating an upper seal with the upper end of the dual barrier plug, between the outer wall surface of the dual barrier plug and the second interior bore of the tubular member, and between the outer wall surface of the valve selector member and the third interior bore of the dual barrier plug;

and preventing upward fluid flow from below the lower end of the dual barrier plug by the sealing of the upper end lower seals about the outer wall surface of the dual barrier plug and about the outer wall surface of the valve selector member.

13. The method of claim 12, including utilizing as the tubular member a frac spool.

14. The method of claim 12, including providing the tubular member with at least one test port in fluid communication with the second interior bore of the tubular member, and testing the sealing integrity of the upper seal.

15. The method of claim 12, including providing the tubular member with at least one test port in fluid communication with the third interior bore of the dual barrier plug, and testing the sealing integrity of the upper seal.

16. The method of claim 12, including utilizing a running tool to move the dual barrier plug and the valve selector member into the tubular member.

17. The method of claim 12, including utilizing a plurality of lock-down screws associated with the tubular member to releasably secure the dual barrier plug within the tubular member.

18. The method of claim 12, including utilizing as the upper seal a plurality of individual seals.

19. The method of claim 12, including providing the dual barrier plug with a valve associated with the lower end of the dual barrier plug; and selectively actuating the valve, to provide selective fluid flow to the third interior bore of the dual barrier plug, by moving the valve selector member to actuate the valve.

20. The method of claim 12, including providing the dual barrier plug with at least one fluid passageway in fluid communication between the second interior bore of the tubular member and the third interior bore of dual barrier plug; providing the valve selector member with at least one fluid passageway, and selectively putting the at least one fluid passageways in fluid communication with each other by providing relative movement between the dual barrier plug and the valve selector member.

CLAIMS

We claim:

1. A dual barrier plug system, for use with a wellhead having a first tubular member having a first interior bore, comprising:

a second tubular member, having an upper and a lower end, associated with the first tubular member, the second tubular member having a second interior bore;

a dual barrier plug, having an upper and a lower end, an outer wall surface, a third interior bore, and a valve associated with the lower end of the dual barrier plug, the valve, upon actuation, providing selective fluid flow to the third interior bore of the dual barrier plug, and the dual barrier plug being received within the second interior bore of the second tubular member;

a valve selector member having an upper end and a lower end, and an outer wall surface, the valve selector member being received, and selectively moveable within the third interior bore of the dual barrier plug, the valve selector member including a valve actuator member to actuate the valve associated with the dual barrier plug;

a lower seal associated with the lower end of the dual barrier plug adapted to provide a seal between the outer wall surface of the dual barrier plug and the first interior bore of the first tubular member;

an upper seal associated with the upper end of the dual barrier plug, disposed between the outer wall surface of the dual barrier plug and the second interior bore of the second tubular member, and disposed between the outer wall surface of the valve selector member and the third interior bore of the dual barrier plug, whereby upward fluid flow from below the lower end of the dual barrier plug may be prevented by the upper and lower seals; and

a running tool which moves the dual barrier plug and the valve selector member into the second tubular member, and which moves the valve selector member within the dual barrier plug to open the valve associated with the dual barrier plug.

2. The dual barrier plug system of claim 1, wherein the first tubular member is a tubing spool associated with the wellhead.

3. The dual barrier plug system of claim 1, wherein the second tubular member is a frac spool.

4. The dual barrier plug system of claim 1, wherein the first interior bore has a first internal diameter and the second interior bore has a second internal diameter, and the first and second internal diameters are substantially equal to each other.

5. The dual barrier plug system of claim 1, wherein the second tubular member includes at least one test port in fluid communication with the second interior bore of the second tubular member.

6. The dual barrier plug system of claim 1, wherein the second tubular member includes at least one test port in fluid communication with the third interior bore of the dual barrier plug.

7. The dual barrier plug system of claim 1, including a plurality of lock-down screws associated with the second tubular member to releasably secure the dual barrier plug within the second tubular member.

8. The dual barrier plug system of claim 1, wherein the upper seal includes a plurality of individual seals.

9. The dual barrier plug system of claim 1, wherein the valve is a poppet valve disposed in the lower end of the dual barrier plug.

10. The dual barrier plug system of claim 1, wherein the dual barrier plug includes at least one fluid passageway in fluid communication between the second interior bore of the second tubular member and the third interior bore of the dual barrier plug; and the valve selector member has at least one fluid passageway in selective fluid communication with the at least one fluid passageway of the dual barrier plug, upon relative movement between the dual barrier plug and the valve selector member.

11. A method for providing two barriers to prevent upward fluid flow from a wellhead through a frac tree having a lower master valve and a tubing spool, disposed beneath the lower master valve, the tubing spool having a first interior bore, comprising:

providing a tubular member, having an upper and a lower end and a second interior bore, between the lower master valve and the tubing spool;

disposing a dual barrier plug within the second interior bore of the tubular member;

disposing a valve selector member within the third interior bore of the dual barrier plug, the valve selector member having an upper end and a lower end, and an outer wall surface;

associating a lower seal with the lower end of the dual barrier plug to provide a seal between the outer wall surface of the dual barrier plug and the first interior bore of the tubing spool;

associating an upper seal with the upper end of the dual barrier plug, between the outer wall surface of the dual barrier plug and the second interior bore of the tubular member, and between the outer wall surface of the valve selector member and the third interior bore of the dual barrier plug;

preventing upward fluid flow from below the lower end of the dual barrier plug by the sealing of the upper and lower seals about the outer wall surface of the dual barrier plug and about the outer wall surface of the valve selector member; and

utilizing a running tool to move the dual barrier plug and the valve selector member into the tubular member.

12. The method of claim 11, including utilizing as the tubular member a frac spool.

13. The method of claim 11, including providing the tubular member with at least one test port in fluid communication with the second interior bore of the tubular member, and testing the sealing integrity of the upper seal.

14. The method of claim 11, including providing the tubular member with at least one test port in fluid communication with the third interior bore of the dual barrier plug, and testing the sealing integrity of the upper seal.

15. The method of claim 11, including utilizing a plurality of lock-down screws associated with the tubular member to releasably secure the dual barrier plug within the tubular member.

16. The method of claim 11, including utilizing as the upper seal a plurality of individual seals.

17. The method of claim 11, including providing the dual barrier plug with a valve associated with the lower end of the dual barrier plug; and selectively actuating the valve, to provide selective fluid flow to the third interior bore of the dual barrier plug, by moving the valve selector member to actuate the valve.

18. The method of claim 11, including providing the dual barrier plug with at least one fluid passageway in fluid communication between the second interior bore of the tubular member and the third interior bore of dual barrier plug; providing the valve selector member with at least one fluid passageway, and selectively putting the at least one fluid passageways in fluid communication with each other by providing relative movement between the dual barrier plug and the valve selector member.