CLAIMS:

1. A system for injecting fluids into a well, comprising:

a production tree (2) having a mandrel (6) at the top thereof and attached to the top of a well having production tubing, the tree (2) having a production bore (4) arranged and designed to be in fluid communication with the production tubing of the well; and

a fluid supply line (22) attached to the mandrel (6) of the tree (2) and in fluid communication with the production bore (4) through the top of the tree (2).

2. The system of claim 1, further comprising:

a connector (24) positioned between, and attached to both the fluid supply line (22) and the mandrel (6).

3. The system of any preceding claim, wherein the fluid supply line (22) is connected to the production bore (4) of the tree by at least one port (8), and wherein the at least one port (8) has at least one valve (10, 16, 20) positioned therein.

4. The system of claim 3, wherein the at least one valve (10, 16, 20) is selected from the group consisting of an annulus access valve (10), a crossover valve (16), and a production master valve (20).

5. The system of any preceding claim, wherein the fluid supply line (22) includes at least one valve (26, 28) located upstream of the mandrel (6).

6. The system of claim 5, wherein the at least one valve (26, 28) is selected from the group consisting of an isolator valve (26) and a check valve (28).

7. The system of any preceding claim, further comprising:

an emergency quick disconnect device (36) attached to the fluid supply line (22).

8. The system of any preceding claim, wherein the production tree (2) is a horizontal tree.

9. The system of any one of claims 1 to 7, wherein the tree (2) is a vertical tree.

10. A scale squeeze injection system, comprising:

a production tree (2), comprising:

a first end having a mandrel (6);

a second end having a production bore (4);

at least one port (8) connecting the mandrel (6) with the production bore (4);

at least one valve (10, 16, 20) located within the at least one port (8); and

a scale squeeze supply line (22) attached to the production tree (2) so that the scale squeeze supply line (22) is in fluid communication with the mandrel (6);

wherein the second end of the production tree (2) is attached to a well having production tubing, so that the production bore (4) of the tree (2) is in fluid communication with the production tubing of the well.

11. The system of claim 10, wherein the scale squeeze supply line (22) is attached to the production tree (4) by a connector (24).

12. The system of claim 10 or claim 11, wherein the at least one valve (10, 16, 20) located within the at least one port (8) is a valve (10, 16, 20) selected from the group consisting of an annulus access valve (10), a crossover valve (16), and a master production valve (20).

13. The system of any of claims 10 to 12, wherein the scale squeeze supply line (22) includes at least one valve (26, 28) located upstream of the production tree (2).

14. The system of any of claims 10 to 13, further comprising:

an emergency quick disconnect device (36) attached to the scale squeeze supply line (22).

15. The system of any of claims 10 to 14, wherein the production tree (2) is a horizontal tree.

16. The system of any of claims 10 to 14, wherein the tree (2) is a vertical tree.

17. A method of injecting fluid into a well, comprising:

connecting a production tree (2) to a well so that the production bore (4) of the tree (2) is in fluid communication with production tubing in the well;

connecting a fluid supply line (22) to the mandrel (6) of the tree (2);

providing a fluid path (8) from the fluid supply line (22) to the production bore (4) of the tree (2) through the mandrel (6) of the tree (2); and

injecting fluid through the fluid supply line (22), into the production bore (4) of the tree (2), and into the production tubing of the well.

18. The method of claim 17, further comprising:

removing the plug (30) from the mandrel (6) of the tree (2) before connecting the fluid supply line (22) thereto.

CLAIMS

1. A system for injecting fluids into a well, comprising:

a production tree having a mandrel at the top thereof and attached to the top of a well having production tubing, the mandrel having a mandrel bore therethrough, the tree having a production outlet passage arranged and designed to be in fluid communication with the production tubing of the well;

a production wing valve in the production outlet passage for selectively opening and closing the production outlet passage;

the tree having a tubing annulus passage extending from a tubing annulus surrounding the production tubing to a tubing annulus mandrel flowpath extending from the mandrel bore;

a mandrel flowpath valve for selectively opening and closing the tubing annulus mandrel flowpath;

the tree having a communication passage with a tubing annulus end that joins the tubing annulus passage at a point between the mandrel flowpath valve and the tubing annulus and a production passage end that joins the production outlet passage at a point between the production wing valve and the production tubing;

a fluid supply line attached to the mandrel of the tree above the tubing annulus mandrel flowpath, and in fluid communication with the production tubing via an injection flow path from the mandrel bore through the tubing annulus passage and the communication passage when the tree is in an injection mode with the mandrel flowpath valve open and the production wing valve closed;

a communication passage valve for selectively opening and closing the communication passage; and

wherein the communication valve is open while the tree is in the injection mode and closed while the tree is in the production mode.

2. The system of claim 1, further comprising:

a connector positioned between, and attached to both the fluid supply line and the mandrel.

3. The system of claim 2, wherein the fluid supply line is connected to the production outlet passage of the tree by at least one fluid supply line port extending

through the connector, and wherein the at least one fluid supply line has at least one fluid supply line valve positioned therein.

4. The system of claim 1, wherein while in the production mode, the production outlet passage is in communication with the production tubing with the production wing valve open and the mandrel port valve closed.

5. The system of claim 1, further comprising:

an annulus master valve in the tubing annulus passage between the tubing annulus and the tubing annulus end of the communication passage; and

wherein the annulus master valve is closed while the tree is in the injection mode.

6. The system of claim 2, further comprising:

an emergency quick disconnect device attached between the fluid supply line and the connector.

7. The system of claim 1, further comprising:

a tubing hanger landed in the production tree, the tubing hanger being connected to the production tubing and having a tubing hanger passage in fluid communication with the production tubing and joining the production outlet passage;

a production master valve between the production outlet passage and the tubing hanger passage; and wherein:

the production master valve is open while the tree is in the injection mode.

8. The system of claim 1, wherein:

the mandrel has a cylindrical side wall extending around a mandrel bore axis; and

portion of the tubing annulus mandrel flowpath extends downward within the side wall.

9. A scale squeeze injection system, comprising:

a production tree, comprising:

a first end having a mandrel with a mandrel bore and an annular external profile encircling a mandrel axis;

a second end having a production bore and attached to a well having production tubing in the well and a tubing annulus surrounding the production tubing;

a tubing annulus passage extending from the tubing annulus to a tubing annulus mandrel flowpath extending from the mandrel bore;

a tubing annulus master valve in the tubing annulus passage;

a tubing annulus access valve in the tubing annulus passage between the tubing annulus mandrel flowpath and the tubing annulus master valve;

a production outlet passage leading from the production tubing for connection to a flow line;

a production wing valve in the production outlet passage for selectively opening and closing the production outlet passage;

a crossover passage having a tubing annulus end that joins the tubing annulus passage at a point between the tubing annulus master valve and the tubing annulus access valve, the crossover passage having a production outlet passage end that joins the production outlet passage at a point between the production tubing and the production wing valve;

a crossover valve in the crossover passage;

a connector connects to the external profile of the mandrel;

a scale squeeze supply line attached to the connector so that the scale squeeze supply line is in fluid communication with the mandrel bore above the tubing annulus mandrel port; wherein

the tree having an injection mode with the annulus access valve open, the tubing annulus master valve closed, the crossover valve open, and the production wing valve closed, defining a flow path communicating the fluid supply line with the production tubing via the mandrel bore, the tubing annulus mandrel flowpath, the tubing annulus passage, the crossover passage, and a portion of the production outlet passage between the production wing valve and the production tubing; and

the tree having a production mode with the annulus access valve closed, the tubing annulus master valve closed, the crossover valve closed, and the production wing valve open, defining a flow path communicating the production tubing with the flow line.

10. The system of claim 9, wherein a portion of the tubing annulus passage between the tubing annulus mandrel flowpath and the tubing annulus access valve extends downward within a side wall of the mandrel.

11. The system of claim 9, further comprising:

a tubing hanger landed in the production tree below the tubing annulus mandrel flowpath, the production tubing being connected with the tubing hanger the tubing hanger having a tubing hanger bore concentric with the mandrel bore and a tubing hanger production passage leading from the tubing hanger bore to the production outlet passage;

a production master valve the tubing hanger production passage and the production outlet passage; and wherein

the production master valve is open while the tree is in the injection mode.

12. The system of claim 9, wherein the connector and the fluid supply line are configured to be lowered subsea as a unit and connected to the mandrel.

13. The system of claim 9, further comprising:

an emergency quick disconnect device attached between the scale squeeze supply line and the connector.

14. The system of claim 9, wherein the production tree is a horizontal tree.

15. The system of claim 9, further comprising a fluid supply line valve in the fluid supply line.

16. A method of injecting fluid into a well, comprising:

providing a production tree with a mandrel having a mandrel bore, a production outlet passage, a production wing valve in the production outlet passage, a tubing annulus passage leading to the tubing annulus mandrel flowpath extending from the mandrel bore, an annulus access valve in the tubing annulus passage, and a crossover passage having a tubing annulus end that joins the tubing annulus passage and a production passage end that joins the production outlet passage;

connecting the production tree to a well so that the production outlet passage of the tree is in fluid communication with production tubing in the well and a tubing annulus surrounding the production tubing is in fluid communication with the tubing annulus passage;

connecting a fluid supply line to an upper portion of the mandrel of the tree;

opening the annulus access valve and closing the production wing valve, providing an injection mode fluid path from the fluid supply line into the mandrel bore, through the tubing annulus mandrel flowpath, the tubing annulus passage and the crossover passage to the production outlet passage and into the production tubing;

while in the injection mode, injecting fluid through the fluid supply line, into the production outlet passage of the tree, and into the production tubing of the well; and

closing the annulus access valve and opening the production wing valve, providing a production mode fluid path from the production tubing through the production wing valve.

17. The method of claim 16, further comprising:

providing the tree with a tubing annulus master valve between the tubing annulus and the crossover passage; and

closing the tubing annulus master valve while, the tree is in the injection mode and in the production mode