CLAIMS:

1. An assembly for performing an aligned operation downhole, the assembly comprising:

a tubular for downhole defining an internal bore with a first inner radius, the tubular having a target at a first radial orientation, the internal bore defining a locator profile thereabout at a first location and defining an internal nipple thereabout at a second location, the internal nipple having a second inner radius less than the first inner radius of the internal bore, the internal nipple at least partially defining an orientation slot longitudinally therethrough and disposed at a second radial orientation configured relative to the first radial orientation of the target; and

a tool deployable in a longitudinal direction into the internal bore of the tubular and having first and second portions, the first portion having a locator biased outward to engage in the locator profile of the tubular, the second portion rotatable relative to the first portion and having an operational component to perform the aligned operation at the first radial orientation of the target, the second portion having an orientor biased outward to engage in the orientation slot of the tubular.

2. The assembly of claim 1, wherein the tubular comprises a plurality of tubular components coupled together.

3. The assembly of claim 2, wherein a first of the tubular components defines the locator profile therein, and wherein a second of the tubular components defines the orientation slot.

4. The assembly of claim 3, wherein the second tubular component comprises the target at the first radial orientation.

5. The assembly of claim 2, wherein one of the tubular components comprises a safety valve housing defining the orientation slot, the safety valve housing having a hydraulic passage therein as the target at the first radial orientation.

6. The assembly of any one of claims 1 to 5, wherein the second inner radius of the internal nipple defines a taper adjacent the orientation slot increasing a lead-in of the second inner radius in a radial direction inward toward the orientation slot.

7. The assembly of any one of claims 1 to 6, wherein the orientation slot comprises a channel defined through the nipple and having a face inset at a depth into the internal nipple, the face having a lead sidewall on a lead edge in the radial direction and having a back sidewall on a back edge in the radial direction.

8. The assembly of claim 7, wherein the back sidewall defines an acute angle relative to the face.

9. The assembly of claim 7 or 8, wherein the channel comprises an open end disposed at a downhole edge of the internal nipple.

10. The assembly of claim 9, wherein the channel further comprises another open end disposed at an uphole edge of the internal nipple.

11. The assembly of any one of claims 1 to 10, wherein the tool comprises a rotational drive disposed between the first and second portions of the tool and imparting rotational movement to the second portion in a rotational direction in the internal bore, the orientor rotatable with the second portion and biased outward to engage in the orientation slot, the second portion with the orientor engaged in the orientation slot aligning the operational component for the aligned operation at the first radial orientation of the target.

12. The assembly of claim 11, wherein the locator comprises a plurality of keys disposed on the first portion and biased outward from a retracted condition to an extended condition.

13. The assembly of claim 11 or 12, wherein the rotational drive comprises:

a sleeve movable in the longitudinal direction in a housing of the first portion and having at least one external tooth and at least one internal tooth, the at least one external tooth engaged with at least one spiral groove defined in the housing; and

an inner rod coupled to the second portion and having at least one longitudinal spline engaged with the at least one internal tooth of the sleeve, the inner rod rotatable with the sleeve in the radial direction about the longitudinal axis.

14. The assembly of claim 11 or 12, wherein the rotational drive comprises:

a sleeve movable in the longitudinal direction in a housing of the first portion and having at least one external spiral groove and at least one internal tooth, the

at least one external spiral groove engaged with at least one tooth in the housing; and

an inner rod coupled to the second portion and having at least one longitudinal spline engaged with the at least one internal tooth of the sleeve, the inner rod rotatable with the sleeve in the radial direction about the longitudinal axis.

15. The assembly of claim 11 or 12, wherein the rotational drive comprises:

an inner rod coupled to the second portion; and

a spring coupled between the first portion and the inner rod and held in torsion, the spring rotating the inner rod in the radial direction about the longitudinal axis.

16. The assembly of any one of claims 1 to 15, wherein the orientor comprises a key extending longitudinally along the second portion and biased laterally outward from a retracted condition to an extended condition.

17. The assembly of any one of claims 1 to 16, wherein the second portion comprises an internal member having a carriage disposed externally thereon, the carriage biased toward a retracted state on the internal member, the carriage having the orientor disposed thereon and biased toward an extended condition, the internal member movable longitudinally relative to the carriage and forcing the carriage in an extended state into contact with the internal bore of the tubular.

18. An assembly for performing an aligned operation downhole, the assembly comprising:

a tubular for downhole defining an internal bore with a first inner radius, the tubular having a target at a first radial orientation;

a locator profile defined about the internal bore at a first location;

an internal nipple defined about the internal bore at a second location, the internal nipple having a second inner radius less than the first inner radius of the internal bore; and

an orientation slot at least partially defined longitudinally through the internal nipple and disposed at a second radial orientation configured relative to the first radial orientation of the target.

19. The assembly of claim 18, further comprising:

a tool deployable in a longitudinal direction into the internal bore and having first and second portions, the second portion rotatable relative to the first portion and having an operational component to perform the aligned operation at the first radial orientation of the target;

a locator disposed on the first portion of the tool and biased outward to engage in the locator profile of the tubular;

a rotational drive disposed between the first and second portions of the tool and imparting rotational movement to the second portion in a rotational direction in the internal bore; and

an orientor disposed on the second portion of the tool, the orientor rotatable with the second portion and biased outward to engage in the orientation slot, the second portion with the orientor engaged in the orientation slot aligning the operational component for the aligned operation at the first radial orientation of the target.

20. A method performing an aligned operation downhole, the method comprising:

arranging a locator profile at a first location in an internal bore of a tubular;

arranging an orientation slot at a second location in the internal bore of the tubular by at least partially defining the orientation slot longitudinally through an internal nipple having a second inner radius in the internal bore less than a first inner radius of the internal bore;

deploying the tubular downhole;

deploying a tool in a longitudinal direction into the internal bore of the deployed tubular;

locating a locator biased outward on a first portion of the tool in the locator profile;

rotating an orientor biased outward on a second portion of the tool; and

aligning an operational component for the aligned operation on the second portion of the tool by engaging the orientor in the orientation slot of the tubular.

What is claimed is:

1. An assembly for performing an aligned operation downhole, the assembly comprising:
a tubular for downhole defining an internal bore with a first inner radius, the tubular having a target at a first radial orientation, the internal bore defining a locator profile thereabout at a first location and defining an internal nipple thereabout at a second location, the internal nipple having a second inner radius less than the first inner radius of the internal bore, the internal nipple at least partially defining an orientation slot longitudinally therethrough and disposed at a second radial orientation configured relative to the first radial orientation of the target, the orientation slot comprising a channel defined through the nipple, the channel having: a face inset at a depth into the internal nipple, a lead sidewall extending in a radial direction on a lead edge of the face, and a back sidewall extending in the radial direction on a back edge of the face; and
a tool deployable in a longitudinal direction into the internal bore of the tubular and having first and second portions, the first portion having a locator biased outward to engage in the locator profile of the tubular, the second portion rotatable relative to the first portion and having an operational component to perform the aligned operation at the first radial orientation of the target, the second portion having an orientor biased outward to engage in the orientation slot of the tubular.

2. The assembly of claim 1, wherein the tubular comprises a plurality of tubular components coupled together.

3. The assembly of claim 2, wherein a first of the tubular components defines the locator profile therein, and wherein a second of the tubular components defines the orientation slot.

4. The assembly of claim 3, wherein the second tubular component comprises the target at the first radial orientation.

5. The assembly of claim 2, wherein one of the tubular components comprises a safety valve housing defining the orientation slot, the safety valve housing having a hydraulic passage therein as the target at the first radial orientation.

6. The assembly of claim 1, wherein the second inner radius of the internal nipple defines a taper adjacent the orientation slot increasing a lead-in of the second inner radius in a radial direction inward toward the orientation slot.

7. The assembly of claim 1, wherein the back sidewall defines an acute angle relative to the face.

8. The assembly of claim 1, wherein the channel comprises an open end disposed at a downhole edge of the internal nipple.

9. The assembly of claim 8, wherein the channel further comprises another open end disposed at an uphole edge of the internal nipple.

10. The assembly of claim 1, wherein the tool comprises a rotational drive disposed between the first and second portions of the tool and imparting rotational movement to the second portion in a rotational direction in the internal bore, the orientor rotatable with the second portion and biased outward to engage in the orientation slot, the second portion with the orientor engaged in the orientation slot aligning the operational component for the aligned operation at the first radial orientation of the target.

11. The assembly of claim 10, wherein the locator comprises a plurality of keys disposed on the first portion and biased outward from a retracted condition to an extended condition.

12. The assembly of claim 10, wherein the rotational drive comprises:
a sleeve movable in the longitudinal direction in a housing of the first portion and having at least one external tooth and at least one internal tooth, the at least one external tooth engaged with at least one spiral groove defined in the housing;

and an inner rod coupled to the second portion and having at least one longitudinal spline engaged with the at least one internal tooth of the sleeve, the inner rod rotatable with the sleeve in the radial direction about the longitudinal axis.

13. The assembly of claim 10, wherein the rotational drive comprises:
a sleeve movable in the longitudinal direction in a housing of the first portion and having at least one external spiral groove and at least one internal tooth, the at least one external spiral groove engaged with at least one tooth in the housing; and an inner rod coupled to the second portion and having at least one longitudinal spline engaged with the at least one internal tooth of the sleeve, the inner rod rotatable with the sleeve in the radial direction about the longitudinal axis.

14. The assembly of claim 10, wherein the rotational drive comprises:
an inner rod coupled to the second portion; and
a spring coupled between the first portion and the inner rod and held in torsion, the spring rotating the inner rod in the radial direction about the longitudinal axis.
15. The assembly of claim 1, wherein the orientor comprises a key extending longitudinally along the second portion and biased laterally outward from a retracted condition to an extended condition.

16. The assembly of claim 1, wherein the second portion comprises an internal member having a carriage disposed externally thereon, the carriage biased toward a retracted state on the internal member, the carriage having the orientor disposed thereon, the orientor being biased toward an extended condition on the carriage, the internal member movable longitudinally relative to the carriage and forcing the carriage in an extended state into contact with the internal bore of the tubular.

17. An assembly for performing an aligned operation downhole, the assembly comprising:
a tubular for downhole defining an internal bore with a first inner radius, the tubular having a target at a first radial orientation, the internal bore defining a locator profile thereabout at a first location and defining an internal nipple thereabout at a second

location, the internal nipple having a second inner radius less than the first inner radius of the internal bore, the internal nipple at least partially defining an orientation slot longitudinally therethrough and disposed at a second radial orientation configured relative to the first radial orientation of the target; and

a tool deployable in a longitudinal direction into the internal bore of the tubular and having first and second portions, the first portion having a locator biased outward to engage in the locator profile of the tubular, the second portion rotatable relative to the first portion and having an operational component to perform the aligned operation at the first radial orientation of the target, the second portion having an orientor biased outward to engage in the orientation slot of the tubular,

wherein the tool comprises a rotational drive disposed between the first and second portions of the tool and imparting rotational movement to the second portion in a rotational direction in the internal bore, the orientor rotatable with the second portion and biased outward to engage in the orientation slot, the second portion with the orientor engaged in the orientation slot aligning the operational component for the aligned operation at the first radial orientation of the target.

18. The assembly of claim 17, wherein the tubular comprises a plurality of tubular components coupled together.

19. The assembly of claim 18, wherein a first of the tubular components defines the locator profile therein, and wherein a second of the tubular components defines the orientation slot.

20. The assembly of claim 19, wherein the second tubular component comprises the target at the first radial orientation.

21. The assembly of claim 18, wherein one of the tubular components comprises a safety valve housing defining the orientation slot, the safety valve housing having a hydraulic passage therein as the target at the first radial orientation.

22. The assembly of claim 17, wherein the second inner radius of the internal nipple defines a taper adjacent the orientation slot increasing a lead-in of the second inner radius in a radial direction inward toward the orientation slot.

23. The assembly of claim 17, wherein the locator comprises a plurality of keys disposed on the first portion and biased outward from a retracted condition to an extended condition.

24. The assembly of claim 17, wherein the rotational drive comprises:
a sleeve movable in the longitudinal direction in a housing of the first portion and having at least one external tooth and at least one internal tooth, the at least one external tooth engaged with at least one spiral groove defined in the housing;
and an inner rod coupled to the second portion and having at least one longitudinal spline engaged with the at least one internal tooth of the sleeve, the inner rod rotatable with the sleeve in the radial direction about the longitudinal axis.

25. The assembly of claim 17, wherein the rotational drive comprises:
a sleeve movable in the longitudinal direction in a housing of the first portion and having at least one external spiral groove and at least one internal tooth, the at least one external spiral groove engaged with at least one tooth in the housing; and
an inner rod coupled to the second portion and having at least one longitudinal spline engaged with the at least one internal tooth of the sleeve, the inner rod rotatable with the sleeve in the radial direction about the longitudinal axis.

26. The assembly of claim 17, wherein the rotational drive comprises:
an inner rod coupled to the second portion; and
a spring coupled between the first portion and the inner rod and held in torsion, the spring rotating the inner rod in the radial direction about the longitudinal axis.

27. The assembly of claim 17, wherein the orientor comprises a key extending longitudinally along the second portion and biased laterally outward from a retracted condition to an extended condition.

28. The assembly of claim 17, wherein the second portion comprises an internal member having a carriage disposed externally thereon, the carriage biased toward a retracted state on the internal member, the carriage having the orientor disposed thereon, the orientor being biased toward an extended condition on the carriage, the internal member movable longitudinally relative to the carriage and forcing the carriage in an extended state into contact with the internal bore of the tubular.