CLAIMS

What is claimed is:

1. A method of installing a hanger at a target location within a wellhead, the hanger having a locking mechanism to secure the hanger within the wellhead, the wellhead having one or more sensors, the method comprising:

lowering the hanger within the wellhead;

using the one or more sensors to detect when the hanger is at the target location;

activating the locking mechanism; and

using the one or more sensors to detect when the locking mechanism has secured the hanger within the wellhead,

wherein using the one or more sensors to detect when the locking mechanism has secured the hanger within the wellhead includes using the one or more sensors to detect movement of a component of the locking mechanism radially outward into a recess of the wellhead,

wherein using the one or more sensors to detect movement of the component of the locking mechanism radially outward into the recess of the wellhead includes:

sensing a first ultrasonic signature from ultrasonic signals emitted from and received by the one or more sensors before activating the locking mechanism, wherein the first ultrasonic signature depends on a distance of the component of the locking mechanism from the one or more sensors; and

sensing a second ultrasonic signature from ultrasonic signals emitted from and received by the one or more sensors after activating the locking mechanism, wherein the second ultrasonic signature depends on the distance of the component of the locking mechanism from the one or more sensors and differs from the first ultrasonic signature due to the movement of the component of the locking mechanism radially outward into the recess of the wellhead.

2. The method of claim 1, wherein the one or more sensors include a first sensor and a second sensor, using the one or more sensors to detect when the hanger is at the target location includes using the first sensor to detect when the hanger is at the target location, and using the one or more sensors to detect when the locking mechanism has secured the hanger within the wellhead includes using the second sensor to detect when the locking mechanism has secured the hanger within the wellhead.

3. The method of claim 2, wherein the first sensor and the second sensor are positioned at different axial locations along the wellhead.

4. The method of claim 1, wherein the locking mechanism includes a lockdown ring.