## CLAIMS

1. An apparatus for aligning a flange to a pipe, the apparatus comprising:

a base;

a jig movably supported on the base, wherein the jig is to mount the flange thereon;

a rack for supporting the pipe;

a detector attached to the base and disposed adjacent to the jig, wherein the detector is to determine a flange position reference;

wherein the jig is rotatable relative to the detector by which the detector measures a profile of an inner surface of the flange to determine the flange position reference, and to move the flange based on the flange position reference to align the flange to the pipe.

2. The apparatus of claim 1, further comprising a first supporting plate slidably mounted to the base and a second supporting plate slidably mounted to the first supporting plate, wherein the jig is rotatably mounted to the second supporting plate.

~~3. The apparatus of claim 2, wherein the jig is rotatable relative to the detector by which the detector measures a profile of an inner surface of the flange to determine the flange position reference.~~

~~4.~~3. The apparatus of claim 2, wherein the detector is movable relative to the base to measure a profile of an outer surface of the pipe to determine a pipe position reference.

~~5.~~4. The apparatus of claim ~~4~~3, wherein the rack is to rotatably support the pipe by which the pipe is rotatable relative to the detector for the measurement of the outer surface of the pipe to determine the pipe position reference.

6.5. The apparatus of claim 2, further comprising a controller coupled to the detection device and the first and second supporting plates, wherein the controller is to move the jig based on the flange position reference to align the flange to the pipe.

7.6. A method for aligning a flange to a pipe, the method comprising:

mounting the flange to a jig;

measuring an inner surface profile of the flange;

determining a flange position reference according to the inner surface profile;

moving the jig based on the flange position reference to align the flange to the pipe.

8.7. The method of claim 76, wherein measuring an inner surface profile of the flange including positioning a detector adjacent to the jig, rotating the jig with respect to the detector and capturing chord lengths of the inner surface of the flange along predetermined data sampling lines.

9.8. The method of claim 76, further comprising measuring an external surface profile of the pipe, determining a pipe position reference according to the external surface profile, and moving the jig based on the flange position reference and the pipe position reference to align the flange to the pipe.

10.9. The method of claim 98, wherein measuring an external surface profile of the pipe including positioning a detector adjacent to the pipe, rotating the pipe with respect to the detector and capturing chord lengths of the external surface of the pipe along predetermined data sampling lines.