CLAIMS

1. An offshore riser system, comprising:

a riser deploying floor having an opening;

first and second riser joints, each having a longitudinal axis, a box on one of the riser joints and a pin on the other of the riser joints;

the pin having an external grooved profile formed thereon;

at least one locking element carried by the box for movement from an unlocked position into a locked position in engagement with the profile of the pin;

a ring in engagement with the locking element;

a retractable spider supported by the floor at the opening for supporting the first riser joint in the opening while the end of the second riser joint is stabbed into engagement with the end of the first riser joint; and

a make-up tool supported by the floor at the opening for moving the ring relative to the locking element, causing the locking element to move to the locked position to connect the first and second riser joints together.

2. The system according to claim 1, wherein the make-up tool moves the ring axially when moving the ring to the locked position.

3. The system according to claim 1, wherein the make-up tool rotates the ring to cause the locking element to move to the locked position.

4. The system according to claim 1, wherein the make-up tool comprises:

an engaging member;

a positioning device for moving the engaging member inward from a retracted position to an engaged position in engagement with the ring; and

an actuating device for moving the engaging member axially to move the ring axially from the unlocked to the locked position.

5. The system according to claim 1, wherein the make-up tool comprises a plurality of units mounted around the opening in the riser deploying floor, each of the units comprising:

an engaging member;

a positioning device for moving the engaging member inward from a retracted position to an engaged position in engagement with the ring; and

an actuating device for moving the engaging member axially to move the ring axially from the unlocked to the locked position.

6. The system according to claim 1, further comprising:

a retainer mounted to the box for retaining the ring in the locked position; and wherein

the make-up tool engages and releases the retainer when moving the ring from the locked to the unlocked position to disconnect the first and second riser joints.

7. The riser system according to claim 1, further comprising a detent that exerts a force on the ring to releasably hold the ring in the unlocked position; and wherein

the make-up tool has sufficient force to overcome the force exerted by the detent when moving the ring to the locked position.

8. The riser system according to claim 1, wherein:

the locking element has an outward-facing cam surface;

and

the ring has an inward-facing cam surface that slides against the cam surface of the locking element as the ring moves to force the locking element to the locked position.

9. The riser system according to claim 1, wherein said at least one locking member comprises:

a plurality of segments spaced around the box.

10. A riser system for connection between a riser deploying floor and a subsea facility, comprising:

a plurality of riser joints, each of the riser joints having a pipe with a longitudinal axis, a box on one end and a pin on an opposite end, the box having an interior that receives the pin of an adjacent one of the riser joints;

the pin of each riser joint having an external grooved profile formed thereon;

a plurality of segments carried by the box of each of the riser joints for movement from an unlocked position into a locked position in engagement with the profile of an adjacent one of the riser joints;

a ring encircling the box of each of the riser joints and having a cam surface in engagement with an outer side of each of the segments for causing the segments to move to the locked position in response to axial movement of the ring in a first direction relative to the locking element; and a make-up tool, comprising:

at least one make-up unit for mounting to the riser deploying floor, comprising:

an engaging member movably mounted to the unit for engagement with the ring;

a positioning device that moves the engaging member radially inward toward the axis of the riser from a retracted position to an engaged position; and

an actuating device for moving the engaging member axially to move the ring axially from the unlocked to the locked position.

11. The system according to claim 10, wherein said at the least one unit comprises:

a plurality of the units for positioning on the riser deploying floor around the axis of the riser joints.

12. The system according to claim 10, wherein each of the riser joints further comprises:

a pair of flanges, each extending radially from the pipe adjacent each of the ends; and

a plurality of auxiliary tubes spaced around each of the pipe and supported by the flanges at the opposite ends of the pipe.

13. The system according to claim 10, wherein the ring of each of the riser joints is located between the box and the auxiliary tubes.

14. The system according to claim 10, wherein:

the ring of each of the riser joints has an outer surface containing a plurality of axially extending recesses in axial alignment with the auxiliary tubes.

15. The system according to claim 10, further comprising:

a latch mounted to the box of each of the riser joints for retaining the ring in the locked position; and wherein

the make-up tool engages and releases the latch when moving the ring from the locked to the unlocked position to disconnect two of the riser joints.

16. The riser system according to claim 10, further comprising:

a detent that exerts a force on the ring to releasably hold the ring in the unlocked position; and

the make-up tool has sufficient force to overcome the force exerted by the detent when moving the ring to the locked position.

17. A method of making up first and second riser joints, each of the riser joints having a pipe with a longitudinal axis, the method comprising:

(a) providing a box on the first riser joint and mounting to the box at least one locking element and a ring in engagement with the locking element;

(b) providing a pin with an external grooved profile on the second riser joint;

(c) placing the pin in the box;

(d) supporting the first riser joint in an opening of a riser deploying floor and stabbing the second riser joint into engagement with the first riser joint;

(d) providing a make-up tool at the opening of the riser-deploying floor;

(e) moving an engaging member of the make-up tool inwardly from a retracted position into an engaged position with the ring; then

(e) moving the engaging member and thereby the ring to cause the locking element to move from an unlocked to a locked position.

18. The method according to claim 17, wherein step (e) comprises moving the ring axially.

19. The method according to claim 17, wherein step (e) comprises rotating the ring.

20. The method according to claim 17, wherein:

step (e) further comprises latching the ring in the locked position and moving the engaging member to the retracted position.