CLAIMS

What is claimed is:

1. A top-tensioned riser system for an offshore platform comprising:

a subsea riser having a tension joint on an upper portion thereof;

a tension ring having a central axial opening through which the tension joint passes and comprising

a first upper metal section;

a second lower metal section; and,

an intermediate elastomer section between the upper section and the lower section.

2. The top-tensioned riser system of claim 1 wherein the elastomer section is bonded to the upper metal section and the lower metal section.

3. The top-tensioned riser system of claim 2 wherein the elastomer section is bonded to the upper metal section and the lower metal section with an adhesive.

4. The top-tensioned riser system of claim 1 further comprising an adapter ring having a central axial opening through which the tension joint passes and mechanically engaged with the outer surface of the tension joint and bearing against the upper metal section of the tension ring.

5. The top-tensioned riser system of claim 4 wherein at least a portion of the tension joint is externally threaded and at least a portion of the central axial opening of the adapter ring is internally threaded.

6. The top-tensioned riser system of claim 4 wherein at least a portion of the tension joint is externally, circumferentially grooved and at least a portion of the central axial opening of the adapter ring is correspondingly grooved.

7. The top-tensioned riser system of claim 4 wherein the adapter ring is radially segmented into a plurality of removable segments.

8. The top-tensioned riser system of claim 7 wherein the adapter ring further comprises a surface disposed at an acute angle to its central axis which surface bears against the tension ring.

9. A top-tensioned riser system comprising:

a subsea riser having a tension joint on a upper portion thereof, at least a portion of the tension joint having a tapered outer diameter;

a riser tensioner connected at a first end to an upper portion of the tension joint and configured for attachment to a deck structure of an offshore platform at a second, opposing end;

at least two rollers proximate the outer surface of a lower portion of the tension joint such that lateral motion of the lower portion of the tension joint causes the portion of the tension joint having a tapered outer diameter to bear against at least one roller.

10. The top-tensioned riser system of claim 9 wherein the rollers are mounted on roller support arms configured for attachment to the deck structure of the offshore platform such that they extend radially toward the riser tension joint from the platform deck structure.

11. The top-tensioned riser system of claim 10 wherein the roller support arms are biased by a resilient element towards the riser tension joint.

12. The top-tensioned riser system of claim 11 wherein the resilient element comprises a coil spring.

13. The top-tensioned riser system of claim 11 wherein the resilient element comprises a Belleville spring.

14. The top-tensioned riser system of claim 11 wherein the resilient element comprises a plurality of stacked Belleville springs.

15. The top-tensioned riser system of claim 11 wherein the resilient element comprises an elastomer.

16. The top-tensioned riser system of claim 15 wherein the elastomer is rubber.

17. The top-tensioned riser system of claim 9 wherein the rollers comprise an elastomer.

18. The top-tensioned riser system of claim 9 wherein the rollers comprise polyurethane.

19. The top-tensioned riser system of claim 9 wherein the riser tensioner is a push-up tensioner.

20. The top-tensioned riser system of claim 9 further comprising:

a tension ring having a central axial opening through which the tension joint passes and comprising

a first upper metal section;

a second lower metal section; and,

an intermediate elastomer section between the upper section and the lower section.

CLAIMS

What is claimed is:

1. A top-tensioned riser system comprising:

a subsea riser having a tension joint on a upper portion thereof, at least a portion of the tension joint having a tapered outer diameter;

a riser tensioner connected at a first end to an upper portion of the tension joint and configured for attachment to a deck structure of an offshore platform at a second, opposing end;

at least two rollers proximate the outer surface of a lower portion of the tension joint such that lateral motion of the lower portion of the tension joint causes the portion of the tension joint having a tapered outer diameter to bear against at least one roller.

2. The top-tensioned riser system of claim 1 wherein the rollers are mounted on roller support arms configured for attachment to the deck structure of the offshore platform such that they extend radially toward the riser tension joint from the platform deck structure.

3. The top-tensioned riser system of claim 2 wherein the roller support arms are biased by a resilient element towards the riser tension joint.

4. The top-tensioned riser system of claim 3 wherein the resilient element comprises a Belleville spring.

5. The top-tensioned riser system of claim 3 wherein the resilient element comprises a plurality of stacked Belleville springs.

6. The top-tensioned riser system of claim 3 wherein the resilient element comprises an elastomer.

7. The top-tensioned riser system of claim 6 wherein the elastomer is rubber.

8. The top-tensioned riser system of claim 1 wherein the rollers comprise an elastomer.

9. The top-tensioned riser system of claim 1 wherein the rollers comprise polyurethane.

10. The top-tensioned riser system of claim 1 wherein the riser tensioner is a push-up tensioner.

11. The top-tensioned riser system of claim 1 further comprising:

a tension ring having a central axial opening through which the tension joint passes and comprising

a first upper metal section;

a second lower metal section; and,

an intermediate elastomer section between the upper section and the lower section.