CLAIMS

1. A ram-style riser tensioner system, comprising:

a plurality of cylinders, wherein each of the plurality of cylinders comprises a barrel portion, a rod portion disposed at least partially within the barrel portion, and an internal gas accumulator for maintaining a desired tension on a riser as the cylinder strokes the rod portion relative to the barrel portion;

an upper structure coupled to the riser, wherein each of the plurality of cylinders is coupled to the upper structure;

a plurality of support rods coupled to the upper structure for reducing bending moments and/or torsional loads on the plurality of cylinders;

a structural frame configured to be mounted to a hull of a floating platform, wherein the plurality of cylinders are coupled to the structural frame, wherein the structural frame is a single connection point between the ram-style tensioner system and the floating platform, and wherein the structural frame is configured to transfer the bending moments and/or torsional loads from the plurality of cylinders to the plurality of support rods; and

a plurality of external gas accumulators, wherein each external gas accumulator is fluidly coupled to and configured to provide an additional volume of gas to the internal gas accumulator in a corresponding one of the plurality of cylinders, wherein each external gas accumulator is disposed within a corresponding one of the plurality of support rods.

2. The ram-style riser tensioner system of claim 1, further comprising a rolling or sliding interface for engaging the support rods extending through apertures in the structural frame of the ram-style tensioner system, the rolling or sliding interface formed directly between and slidably coupling the support rods to the structural frame.

3. The ram-style riser tensioner system of claim 1, wherein the plurality of support rods are each coupled to the upper structure at positions that are disposed radially outward from the riser.

4. The ram-style riser tensioner system of claim 3, wherein the plurality of cylinders are coupled to the upper structure at positions that are disposed radially outward from the riser and disposed between adjacent support rods such that the cylinders and support rods are arranged in an alternating pattern circumferentially around the riser.

5. The ram-style riser tensioner system of claim 1, wherein the upper structure comprises a manifold for routing gas from the plurality of external gas accumulators to the corresponding plurality of cylinders.

6. The ram-style riser tensioner system of claim 1, wherein the upper structure comprises an upper structure coupled to the top of the plurality of cylinders.

7. The ram-style riser tensioner system of claim 1, further comprising a tension ring fixed to the riser at a tension joint, wherein the tension ring is coupled to the upper structure.

8. The ram-style riser tensioner system of claim 1, further comprising a lower structure, wherein the plurality of support rods extends through apertures in the lower structure.

9. The ram-style riser tensioner system of claim 8, further comprising a rolling or sliding interface on the lower structure for engaging the support rods extending therethrough.

10. The ram-style riser tensioner system of claim 1, further comprising a lower support ring coupled to the plurality of support rods, wherein the lower support ring is disposed around the riser.

11. The ram-style riser tensioner system of claim 1, wherein the plurality of cylinders are directly coupled to the structural frame.

12. The ram-style riser tensioner system of claim 1, wherein the plurality of support rods are entirely separate components from the plurality of cylinders.

13. A method, comprising:

stroking a plurality of cylinders of a ram-style riser tensioner to move a riser relative to a floating platform, wherein each of the plurality of cylinders is coupled to a upper structure coupled to the riser, and wherein each of the plurality of cylinders comprises a barrel portion, a rod portion disposed at least partially within the barrel portion, and an internal gas accumulator;

maintaining a tension on the riser via the internal gas accumulators of the plurality of cylinders as each cylinder strokes the corresponding rod portion relative to the corresponding barrel portion;

transferring bending moments or torsional loads from the plurality of cylinders through a structural frame to a plurality of support rods coupled to the upper structure, wherein the structural frame is mounted to a hull of the floating platform, wherein the plurality of cylinders are coupled to the structural frame, and wherein the structural frame is a single connection point between the ram-style riser tensioner and the floating platform;

reducing bending moments or torsional loads on the plurality of cylinders via the plurality of support rods; and

providing additional volumes of gas to the plurality of cylinders from a plurality of external gas accumulators, wherein each external gas accumulator is fluidly coupled to the internal gas accumulator in a corresponding one of the plurality of cylinders,

wherein each external gas accumulator is disposed within a corresponding one of the plurality of support rods.

14. The method of claim 13, further comprising stroking the plurality of cylinders to move the upper structure, the riser, and the plurality of support rods relative to the structural frame, and moving the plurality of support rods through apertures in the structural frame via a rolling or sliding interface formed directly between and slidably coupling the plurality of support rods to the structural frame.

15. The method of claim 13, further comprising routing gas between each of the external accumulators and each of the corresponding internal accumulators via a manifold disposed on the upper structure.

16. The method of claim 13, wherein the plurality of support rods are each coupled to the support structure at positions that are disposed radially outward from the riser.

17. The method of claim 16, wherein the plurality of cylinders are coupled to the upper structure at positions that are disposed radially outward from the riser and disposed between adjacent support rods such that the cylinders and support rods are arranged in an alternating pattern circumferentially around the riser.