CLAIMS

What is claimed is:

1. A system to facilitate operation of a safety valve, comprising:

a safety valve piston; and

a safety valve piston seal assembly disposed about the safety valve piston, the safety valve piston seal assembly comprising:

a metal spring energized (MSE) seal;

an MSE backup ring adjacent the MSE seal;

at least one V-ring;

a V-ring backup ring engaging the at least one V-ring;

an adapter engaging the at least one V-ring on an opposite side from the V-ring backup ring; and

a load transfer assembly disposed between the adapter and the MSE backup ring to reduce detrimental loading, which would otherwise occur along a load path through the MSE seal, by directing loading to the safety valve piston

wherein the load transfer assembly comprises a load ring engaged with the safety valve piston to transfer loading to the safety valve piston when the at least one V-ring is subjected to back pressure.

2. The system as recited in claim 1, wherein the load ring engages a shoulder of the safety valve piston.

3. The system as recited in claim 2, wherein the load transfer assembly further comprises a V-ring spacer having a portion disposed around the load ring.

4. The system as recited in claim 3, wherein the load transfer assembly further comprises an MSE spacer disposed between the V-ring spacer and the MSE backup ring.

5. The system as recited in claim 1, wherein the safety valve piston seal assembly further comprises a hat ring disposed between the MSE seal and an abutment of the safety valve piston.

6. The system as recited in claim 1, wherein the safety valve piston seal assembly comprises a plurality of safety valve piston seal assemblies arranged to provide a dual pressure seal configuration.

~~7. A system comprising:~~

~~an actuator; and~~

~~a seal assembly disposed about the actuator, the seal assembly comprising:~~

~~a metal spring energized (MSE) seal;~~

~~at least one sealing element; and~~

~~a plurality of load rings dividing the seal assembly into a plurality of zones that separate the MSE seal from the at least one sealing element,~~

~~the at least one sealing element configured to hold pressure and transfer a load to at least one load ring of the plurality of load rings, the at least one load ring of the plurality of load rings being configured to transfer the load to the actuator without loading the MSE seal when the at least one sealing element is subjected to back pressure.~~

~~8. The system of claim 7, further comprising: an adapter engaging the at least one sealing element on one side of the at least one sealing element.~~

~~9. The system of claim 8, the seal assembly further comprising an MSE backup ring adjacent the MSE seal,~~

~~wherein the MSE seal and the MSE backup ring are in a same zone of the plurality of zones, and~~

~~wherein the at least one load ring of the plurality of load rings is disposed between the MSE backup ring and the adapter.~~

~~10. The system of claim 9, the seal assembly further comprising a second backup ring engaging the at least one sealing element on an opposite side of the at least one sealing element.~~

~~11. The system of claim 10, wherein at least one zone of the plurality of zones includes at least two sealing elements separated by the second backup ring.~~

~~12. The system of claim 7, wherein the actuator is a piston body.~~

~~13. The system of claim 7, wherein the at least one sealing element is a pressure energized elastomeric seal.~~

~~14. The system of claim 7, wherein the at least one sealing element is a non-elastomeric seal.~~

~~15. The system of claim 7, wherein the at least one sealing element is a V-ring.~~

~~16. The system of claim 7, wherein the at least one sealing element is a T seal.~~

~~17. The system of claim 7, wherein the load ring engages a shoulder of the actuator.~~

~~18. The system of claim 7, wherein the seal assembly comprises a plurality of seal assemblies arranged to provide a dual pressure seal configuration.~~