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.