(3) In order to check the hose behavior and assure that they do not fall apart in service, WHOI conducted a major cyclic load fatigue test effort at TMT in 2000. A summary of the test results on a medium stretching and high stretching larger size and strength stretch hose is shown in Figure 2:

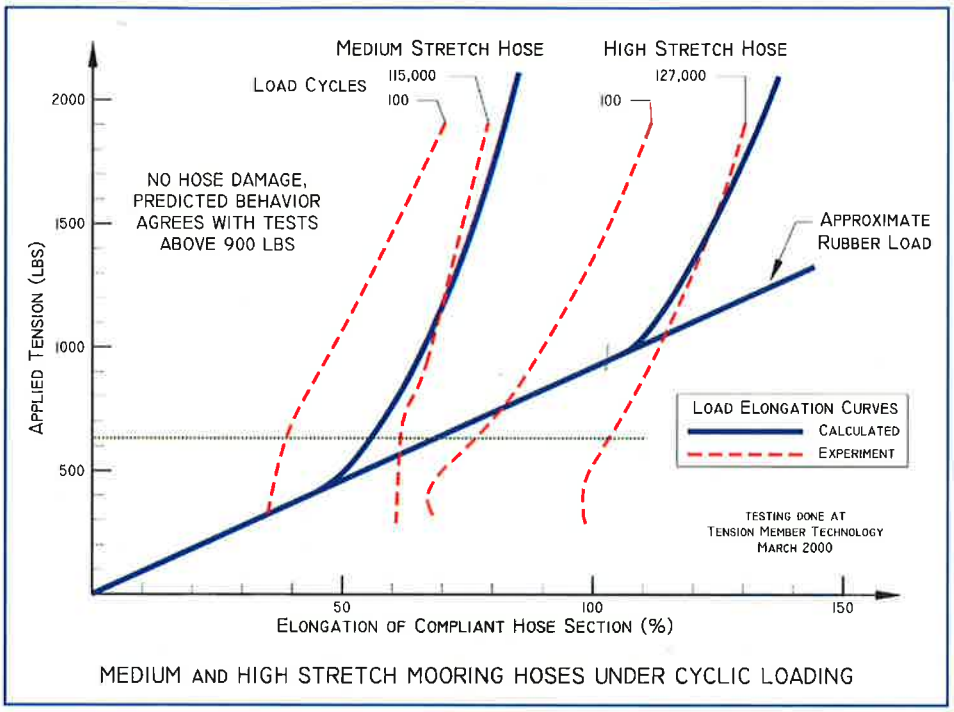

Figure 2: TMT-Fatigue Tests of a Medium-Stretch and High-Stretch Hose, Tension versus Elongation of compliant hose sections. Behavior of the High-Stretch Hose is similar to the AST2 Hose

The cyclic loading curves matched the modeled blue load elongation curves above ~900 lbs fairly closely, but it took about 100,000 load cycles between 300 and 1,900 lbs tension to get to the match. The 1,900 lbs is ~1/3 of the breaking strength of the larger hoses tested. The smaller AST2 stretch hose tensions at 1/3rd of its breaking strength are ~ 630 lbs, the low load would be ~ 100 lbs.

(4) The test speed relative to the hose sample length during the cyclic load tests between two tensions effects the shape and steepness of the load elongation curves. The faster the test speed, the steeper is the load elongation-curve during loading and unloading.

(5) In the first load cycle of a new hose the hose stretches significantly more than at any subsequent cycles, the rubber and tire cord layers are orienting themselves in the direction of the applied load, and stretch out permanently or creep. The hose will not contract to its original length again, and has experienced a mostly permanent length increase or creep after the first two to three cycles. The unloading curve follows a much steeper path than the first loading curve. The second load cycle starts at a significant stretched position and responds with a much steeper path to the upper load. After repeating the stretch cycles a few times a "master hysteresis" set of curves is established. The curves move to the right with increasing number of cycles, the hoses become slightly longer with time or increase their creep, see Figure 2.