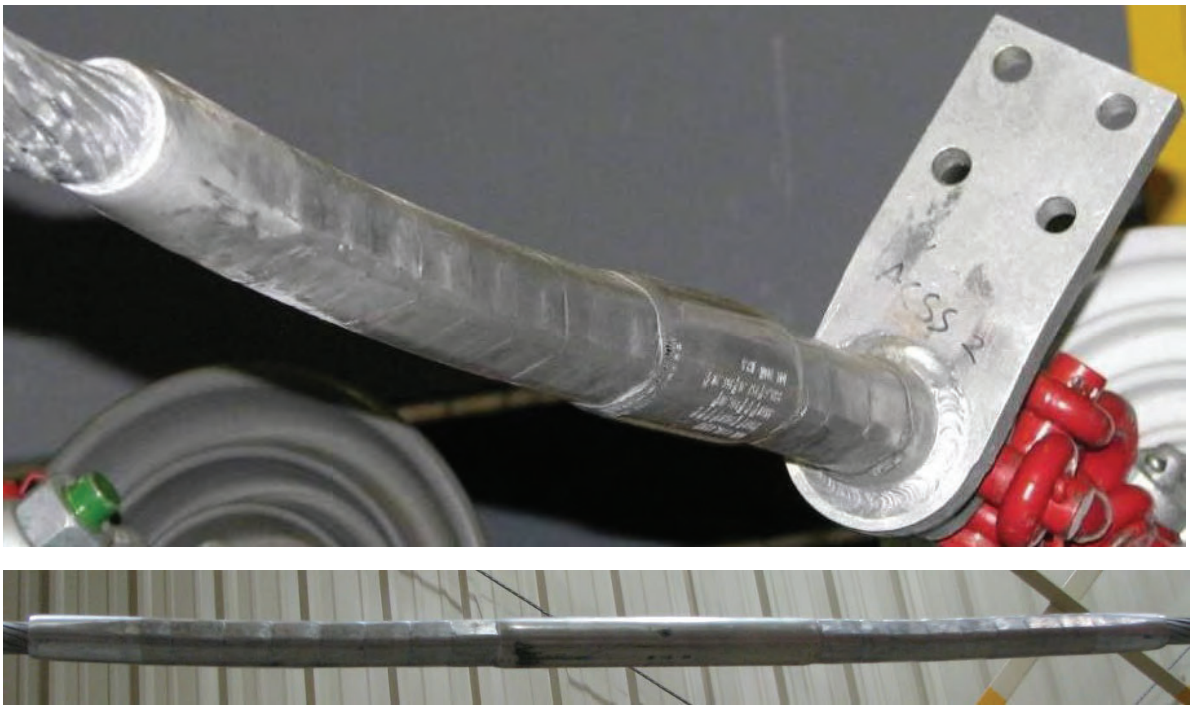

Figure 2-50. Southwire ACSS conductor with AFL Global two-stage compression connector installed

Conductor Specific Test and Measurement Parameters

1625-amps was applied to the Southwire ACSS conductor-connector system. Within the controlled parameters of the indoor lab, the surface temperature of the Southwire ACSS conductor at 1625-amps was 215°C.

Results

Thermal Performance and Line Tension

Dead-ends

Figure 2-51 shows the thermal profiles as well as the tension profile for Southwire ACSS conductor.

The line was re-tensioned after approximately 500 and 1350 cycles after the tension dropped by approximately 20% from the original value. The thermal profiles of the dead-ends have all increased by approximately 25°C from the start to the end of the 1500 test cycles.

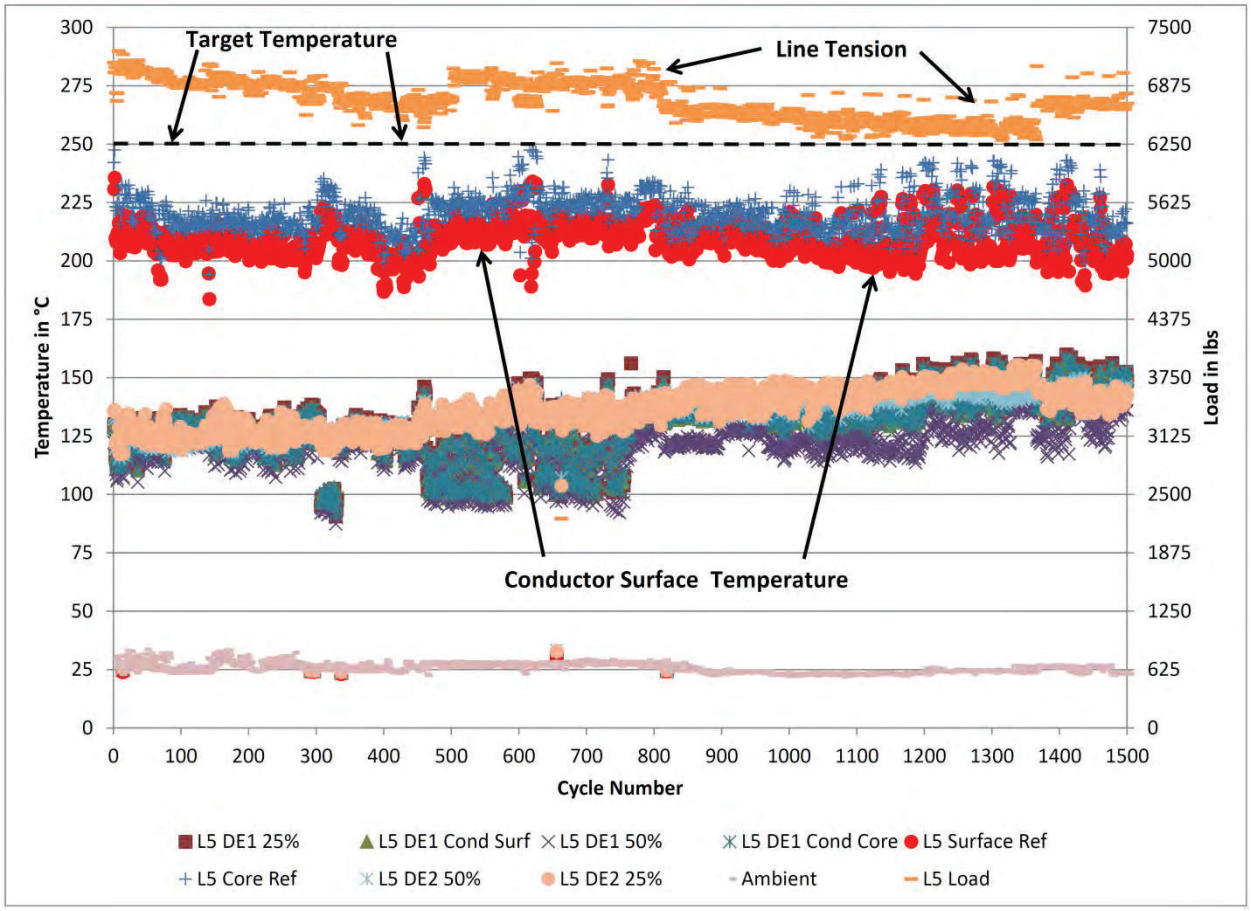

Figure 2-51. Southwire ACSS Line 5 Dead-end Thermal and Tension Profiles

Splices

Figure 2-52 shows the splice thermal profiles as well as the tension profile for line 5. The splice temperatures have increased as the test progressed. The temperature differential between the Southwire ACSS conductor's surface temperature and the splice temperatures decreased from about 65°C at the start of the test to about 20°C at the end of the 1500 test cycles.

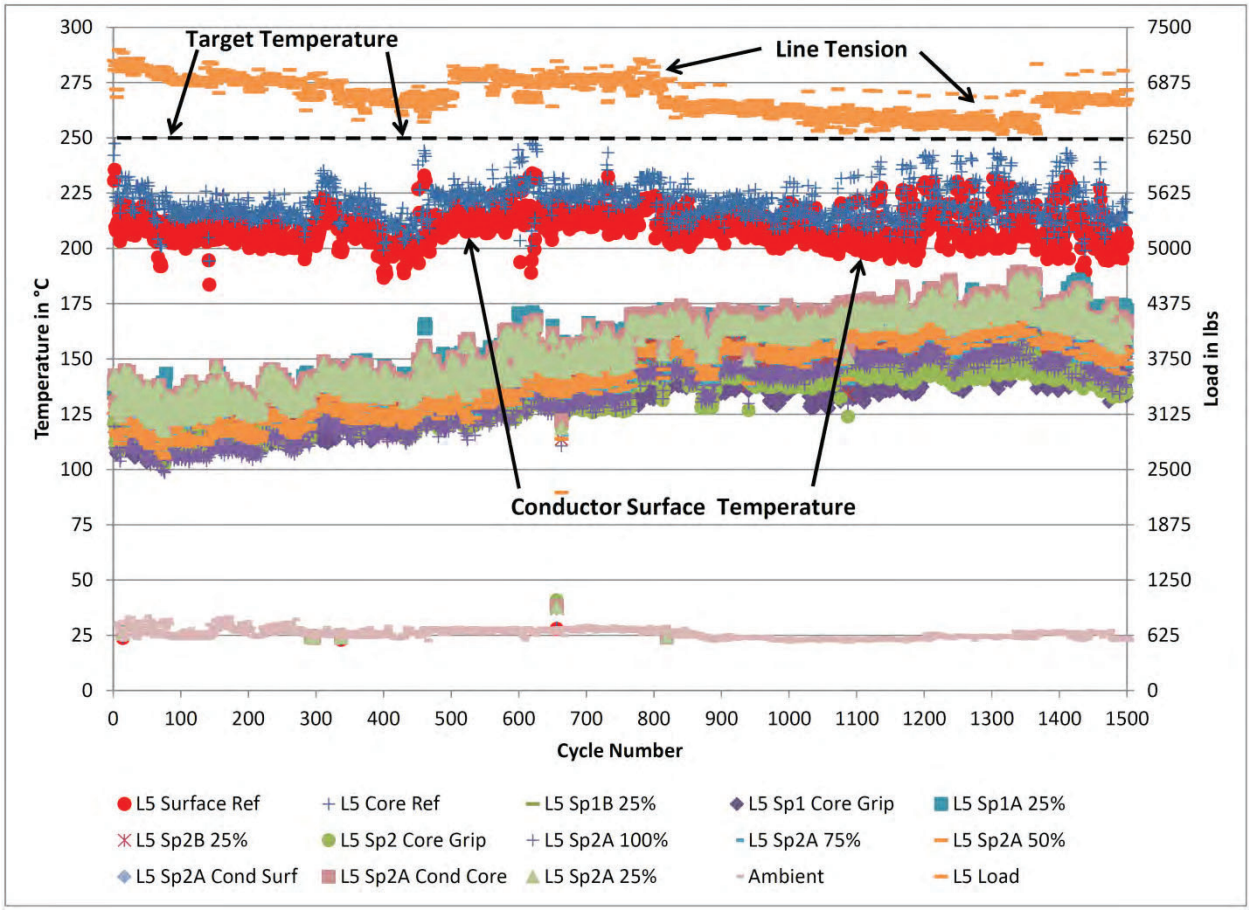

Figure 2-52. Southwire ACSS Line 5 Splice Thermal and Tension Profiles

Electrical Performance

Figure 2-53 shows the resistance measurements for Line 5. The resistance of all the connectors was generally in the 15 – 30 μΩ range. All the resistance measurements were made using a Megger Micro Ohmmeter. It was found that making accurate measurements using the Megger was difficult. The results obtained were not consistent and tended to fluctuate based on the connection of measurements clamps on the Southwire ACSS conductor. At the end of the test cycles resistance measurements on this specific conductor were made using an Ohmstik device.

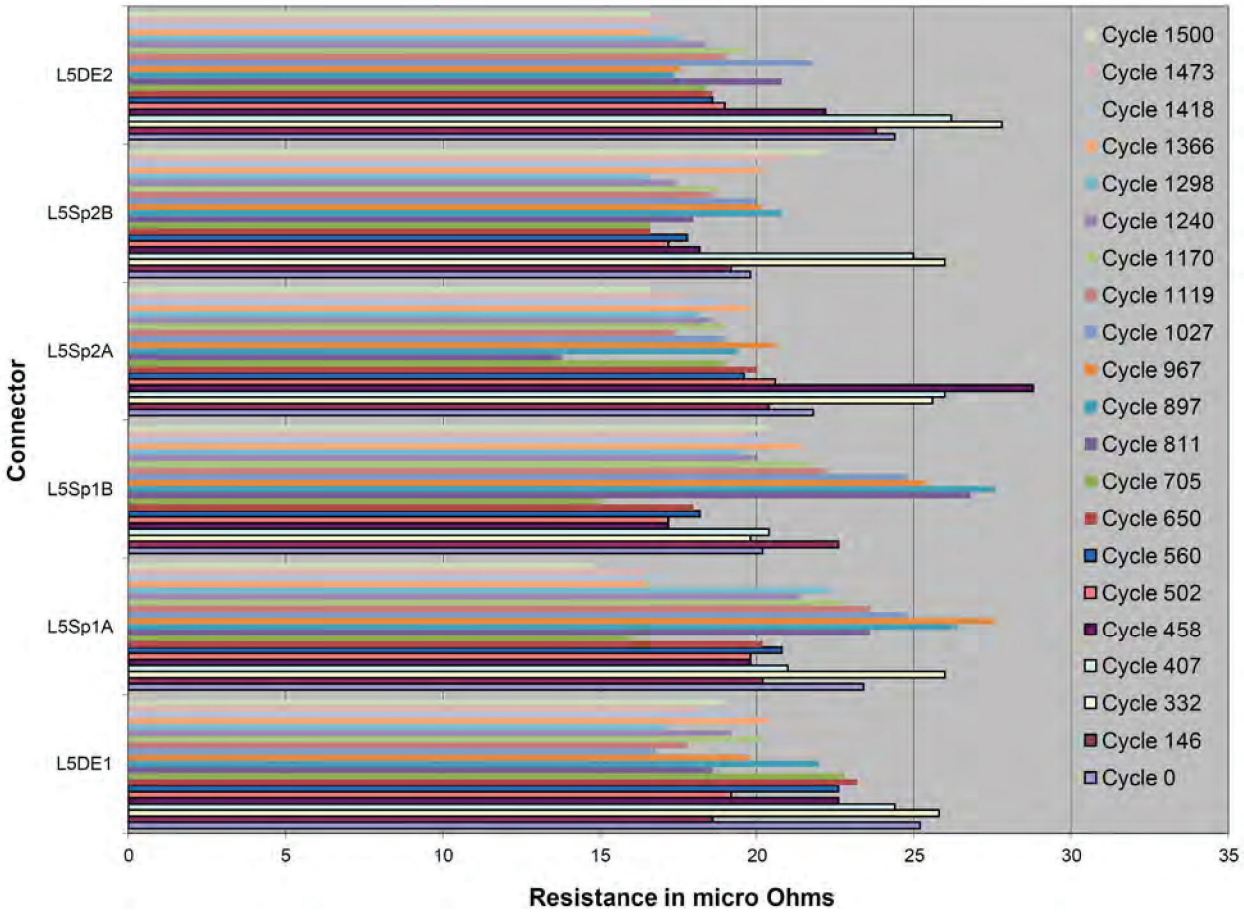

Figure 2-53. Southwire ACSS Line 5 Resistance Measurements

The Ohmstik measurements (not shown) indicated that all the connectors evaluated had a resistance value which was higher than the Southwire ACSS conductor's resistance value. This correlated with the thermal temperature measurements made. Typically, a healthy connector should have a resistance value which is lower than that of the Southwire ACSS conductor (measured over the same length). The resistance results indicate that the connectors have degraded.

Mechanical Performance

Mechanical Tests of the Southwire ACSS conductor were performed. The Southwire ACSS conductor which was evaluated had a rated breaking strength of approximately 28,000 lbs. The only samples available to test were the new un-aged samples as the aged Southwire ACSS conductor was kept in the test frame for further aging. Results of the mechanical tests are shown in Table 2-5.

From Table 2-5 the un-aged connectors which were evaluated all had breaking strengths, which were above 110% of the manufacturers rated strength.

Table 2-5. Southwire ACSS conductor-connector mechanical test results (un-aged samples)

Sample Tested	Breaking Load	%RBS	Comments
New Dead-end 1	32,460	116	N/A
New Dead-end 2	31,539	113	N/A
New Splice 1	31,410	112	Conductor broke at mouth of test clamp
New Splice 2	30,953	111	Conductor pulled out of splice
New Conductor	-	-	No sample available for testing