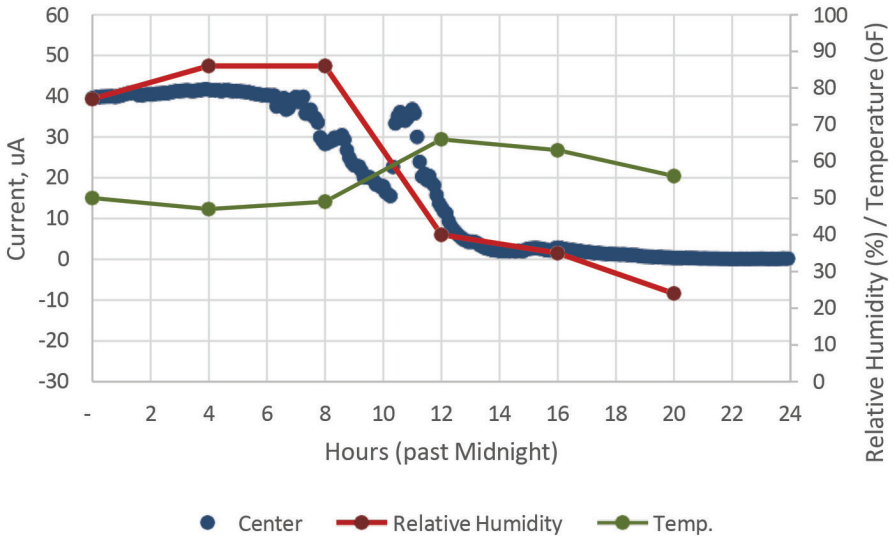


**FIGURE 3** Current exchange at the scribe, and local RH and temperature.

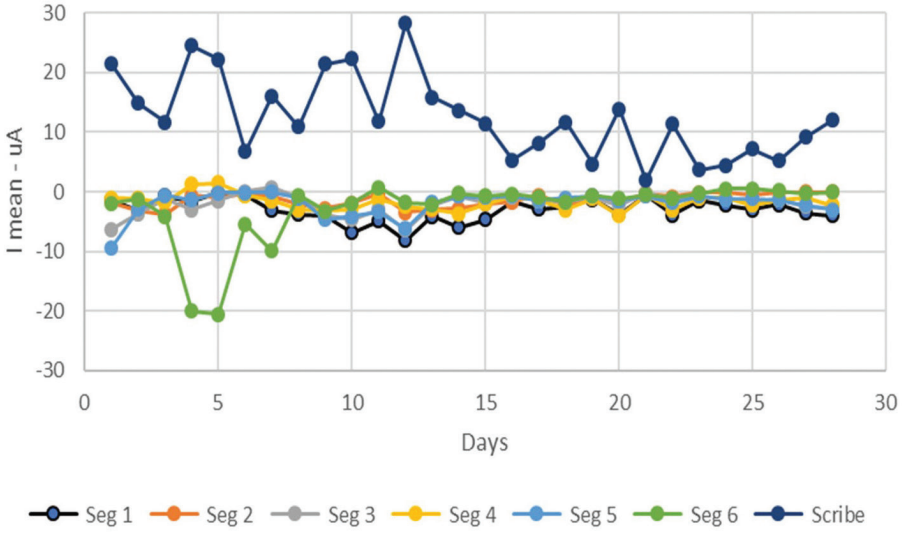


**FIGURE 4** Current exchange to a central bus, thermal spray aluminum/epoxy coated steel to scribe, through day 30 of exposure.

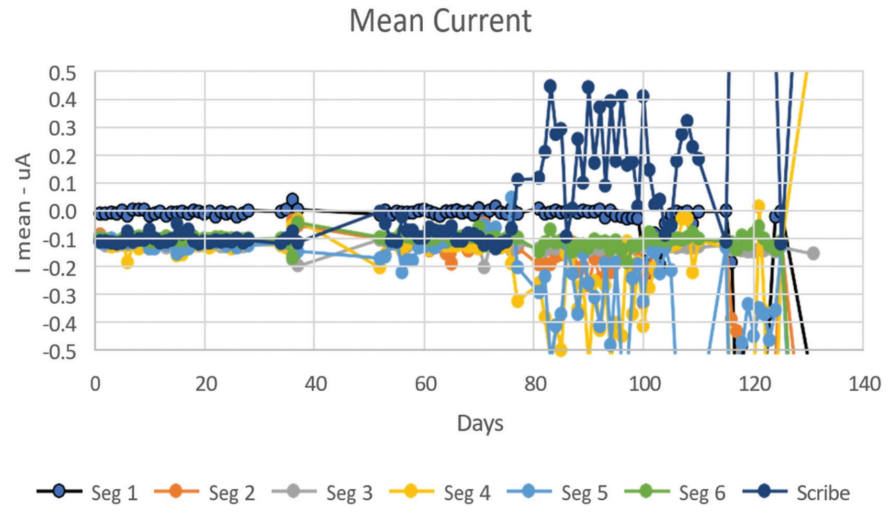


**FIGURE 5** Current exchange to a central bus, epoxy/urethane coated steel to scribe, through day 130 of exposure.

nificant electrochemical potential difference between the active thermal spray coating and the steel center scribe, this example provides a good basis to establish an understanding of the impact of the local environment.

In Figure 2, the primary source of current is segment 6, with the other five segments providing significantly less current at nominally five days of exposure. Figure 3 shows the center segment alone, plotted with the local relative humidity (RH) and temperature on this day. The correlation with humidity is clear and aligns with the common understanding of the tendency for surface salts, such as sodium chloride (NaCl), to deliquesce moisture from humid air. In the data, as the humidity transitions from above 80% RH to below 40% RH, the current drops close to zero amperes.

Figure 4 presents data for this same test cell for the first 30 days of natural exposure. The current plotted daily is the average value over the 24-h period. Over time, the initial current decreases as might be expected in part from the formation of corrosion products. Among the coated segments, the current from segment 6 (days 4 through 8) and segment 1 (days 6 through 16) stand out from the r samples as the most active areas.

Figure 5 provides a similar dataset for an epoxy/urethane coating applied directly to steel, with current exchange to a central scribe. The exposure again is a natural environment with daily wetting with artificial seawater. The magnitude of current in this cell is nominally 10X less than with the thermal spray aluminum applied to steel, as might be expected. In the present cell, the current exchange is created by the anodic behavior of the coated steel vs. the boldly exposed central scribe and anodic undermining of the coating.

At about day 50, segments 4 and 5 began to exhibit the most significant anodic currents. In days 80+, segments 4 and 5 seem joined by segment 2.

Figure 6 shows a view of segment 5 alone, adjacent to the scribe, at different times in the exposure. At day 50, when the current at segment 5 begins to be more anodic than the remaining segments, there is no readily apparent visual clue that the coating is deteriorating. After 100 days, a