Cable Lore

Uncertainties In Predicting Cable Life

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ANACONDA

The process of extruding wire and cable, like so many other manufacturing processes, is subject to minor variations. Because of these minor differences, accurately predicting an absolute value, such as anticipated cable life, is very difficult.

If you were extruding a TW wire, for example, and tried to achieve a diameter of 0.125 inches, the odds are against obtaining this dimension right on the button. But in a controlled process, the odds would be in your favor of achieving a dimension between 0.123 inches and 0.127 inches. For this reason, tolerances, or acceptable variances, are placed on most manufacturing processes.

The odds for accurately predicting cable survival are most favorable when the tolerances are based upon a record of actual performance and the variables in the process are under observation and control. With these tolerances based on sound statistical information, we are ready to forecast anticipated survival. But the safest bet would still be based on a point spread, (a range of service, such as 20-25 years) and not the actual score (precisely 22.5 years).

For the most accurate forecasts of cable longevity, predictions should be based on the following information:

Uniformity All measurements and statistics should be based on millions of feet of the same design and materials, run on the same machine and under the same conditions.

Surveillance Production samples should be measured at a regular frequency with results plotted—and instant analysis can then be made to check whether the process is under control.

Remedial Action Trends can be spotted on a control chart and remedial action taken to prevent any loss of control.

Mathematical Forecasts All forecasting methods should be based on the statistics of chance and follow well-established statistical and mathematical models.

Similarly, statistics can be provided on anticipated survival of a specific power cable in a specific environment. For this application, all that is needed is a life-to-failure record for about 200 cable installations. From this record, a chart can be designed which would:

- Give an average number of years the cable will last (example: 30 years); and
- illustrate the spread in years the cable will last (example: 30-40 years).

This statistical treatment of the data would then provide the odds for what percentage of cables will last a given period of time.

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