Demo: Testing for Special Causes in the Control Chart Builder

In this video, we show how to conduct tests for special causes on an I and MR chart using the Control Chart Builder with the White Polymer Crisis Team data.

Recall that, in this scenario, an improvement team is tasked with improving Yield, and that Yield is related to both MFI and CI. We focus on the variable MFI in this video.

We select Control Chart Builder from the Analyze menu under Quality and Process. We drag the column MFI into the Y drop zone. An Individual and Moving Range Chart is created automatically. We focus on the individuals chart for MFI.

None of the points fall outside the control limits. But there do appear to be some patterns. For example, there are some high values early on, the values drop quickly, and then there appears to be an upward trend until around row 36.

Let's run the eight tests for special causes. To do this, we again right-click on the graph and select Warnings, Tests, and All Tests.

JMP circles points for violated tests and labels each with the test number. When we hold the mouse pointer over these points, JMP provides information on the violated test. Several potential special causes have been detected.

The tests for special causes divides the Control chart into zones. Each zone is one standard deviation wide. To better understand the tests, we display the zones. To do this, we right-click on the graph, select Limits, and then Zones. You can also turn on the zones from the control panel under Limits.

The first violation is for Test 5, two out of three points in a row beyond 2 sigma. These are those initial high points that we observed. We also see a violation at row 36 for Test 6. The test has detected the upward trend. There is another upward trend detected at row 81.

And, starting at row 98, a pattern of alternating increasing and decreasing points was detected. This indicates that something systematic is happening. For example, this might occur if there is a systematic difference in shifts.

This process is clearly unstable. To improve the process, we need to investigate these special causes.

Statistical Thinking for Industrial Problem Solving

Close