Closing The Loop

Using Measured Plant Data for Problem Solving and Continuous Design in 3DCS
Agenda

• What is closing the loop?
• Why do we want to close the loop?
• How do we close the loop?
What is closing the loop?

• Closing the loop is replacing part engineering tolerances (GD&T) with actual part measured tolerances (Plant data)
Quality Intelligence

Engineering thru Production

Define Measurement Strategy

Simulate Mfg. Variation

Resolve via Root Cause Analysis Correlation to Source

Identify Non-Conformances Process Variation

Reports & Dashboards-
- Pinpoint Problems
- Display Mean-shifts

Closed Loop-
- "Correlation" supports
- DFMA Goals

Analysis optimizes-
- GD&T
- Datum’s / Locators
- Build Plans

Measurement Plans-
- Communicate Inspection Requirements
Why do we want to close the loop?

• One of the inaccuracies in a 3D tolerance analysis model is the assumption that all tolerances are normally distributed and centered about nominal.
• Actual measured part data may not be in specification and may have mean shifts.
• Including this information can increase the accuracy of your tolerance analysis.
How do we close the loop?

- Chose the part or parts in your model you want to replace engineering tolerances with measured plant data tolerances

Replace GD&T tolerances with measured data for this part (Top Cover)
How do we close the loop?

- Export a data file for all points in the part

Click export DB2 and select the Top Cover
How do we close the loop?

- Import the Data file and the Cad file into QDM and generate a measurement plan
How do we close the loop?

• Duplicate the measurement plane report and modify it to begin receiving plant data
How do we close the loop?

- Export the measured data from QDM to import into your Tolerance analysis model

From QDM Analyst
How do we close the loop?

- Add a DCS (CMMdev2) tolerance to the part
- Add all part point to tolerance
- Link tolerance to exported QDM data file
- Turn off original GD&T tolerances on the part

- Rerun Simulation Results
Key Points to be conscious of

- Closed loop is discrete point based. DCS/Features points
- QDM links to measurement names. 3DCS measurement and plant measurement names should be the same
- Additional measurement can be added to the measurement plan for any other disciplines.
Key Points to be conscious of
Questions?

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