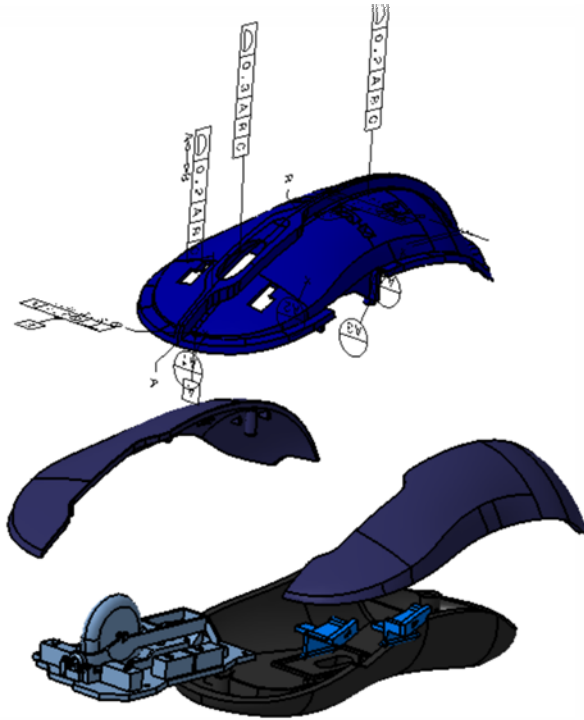


Closing The Loop

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



DCS
ENGINEERING IN NEW DIMENSIONS

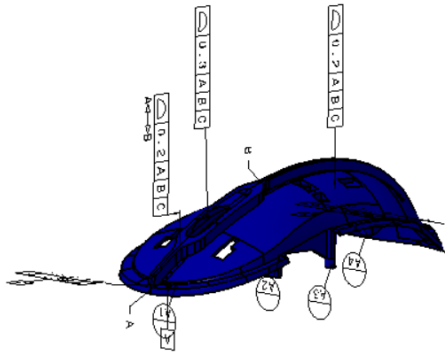
3DCS
Variation Analyst

Agenda

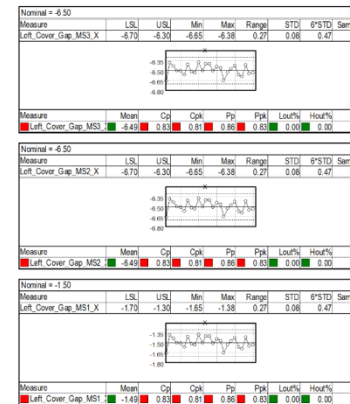
- What is closing the loop?
- Why do we want to close the loop?
- How do we close the loop?

What is closing the loop?

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



Design Tolerances



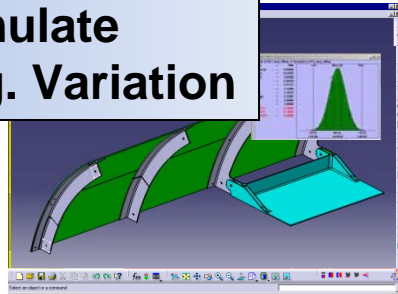
Actual Measured Data

Quality Intelligence

Engineering thru Production

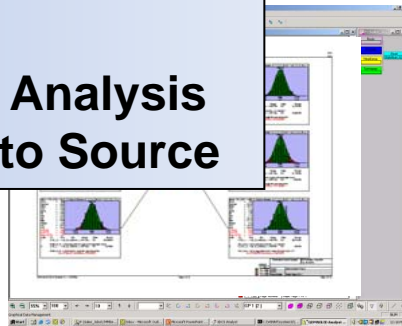
**Simulate
Mfg. Variation**

*Closed Loop-
"Correlation" supports
DFMA Goals*



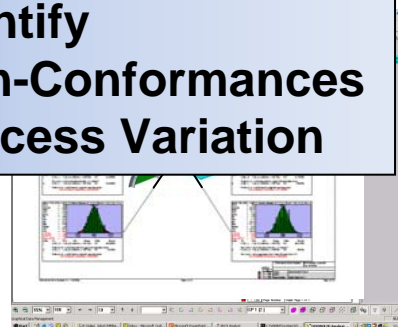
*Analysis optimizes-
GD&T
Datum's / Locators
Build Plans*

**Resolve via
Root Cause Analysis
Correlation to Source**

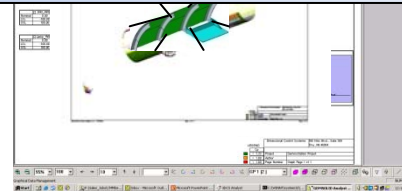


*Reports & Dashboards-
Pinpoint Problems
Display Mean-shifts*

**Identify
Non-Conformances
Process Variation**



**Define
Measurement Strategy**



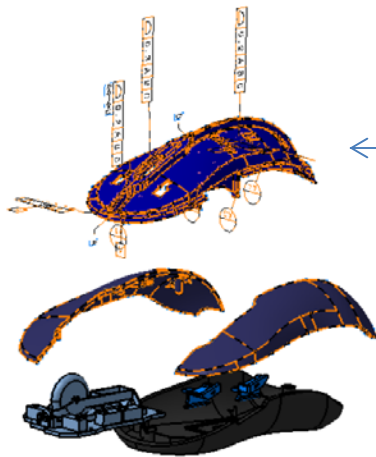
*Measurement Plans-
Communicate
Inspection
Requirements*

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?

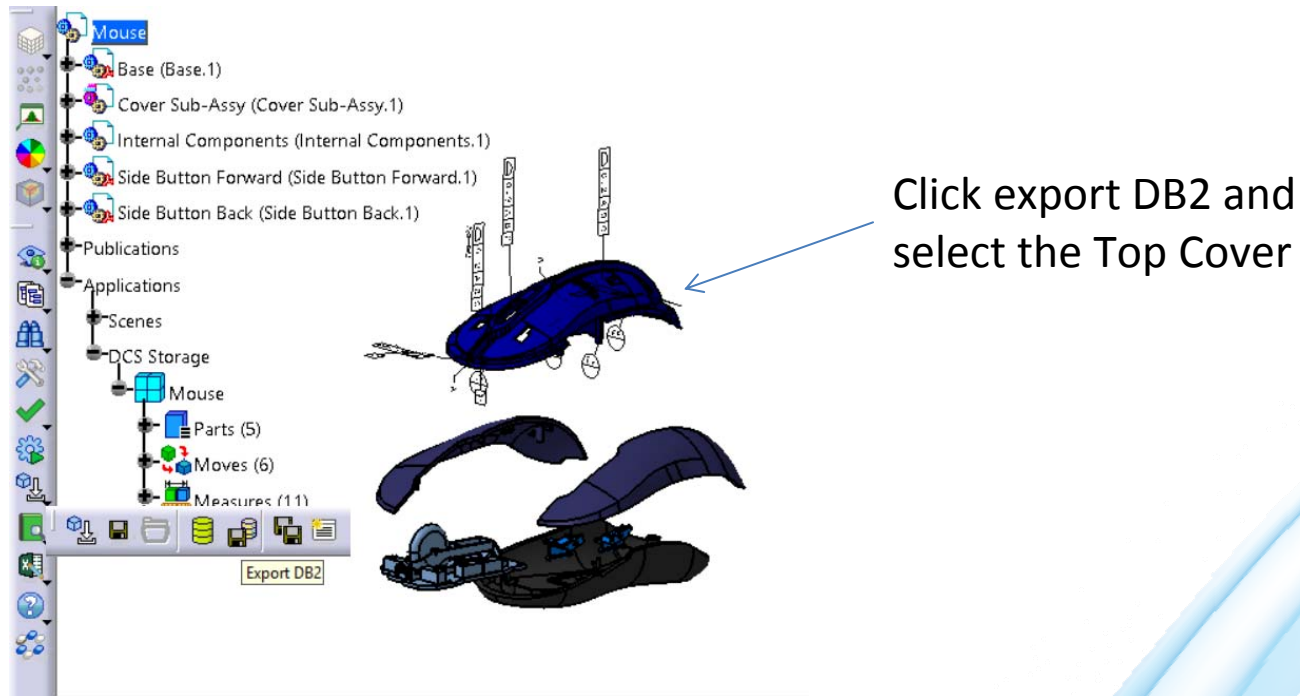
- Chose the part or parts in your model you want to replace engineering tolerances with measured plant data tolerances



Replace GD&T tolerances with
measured data for this part
(Top Cover)

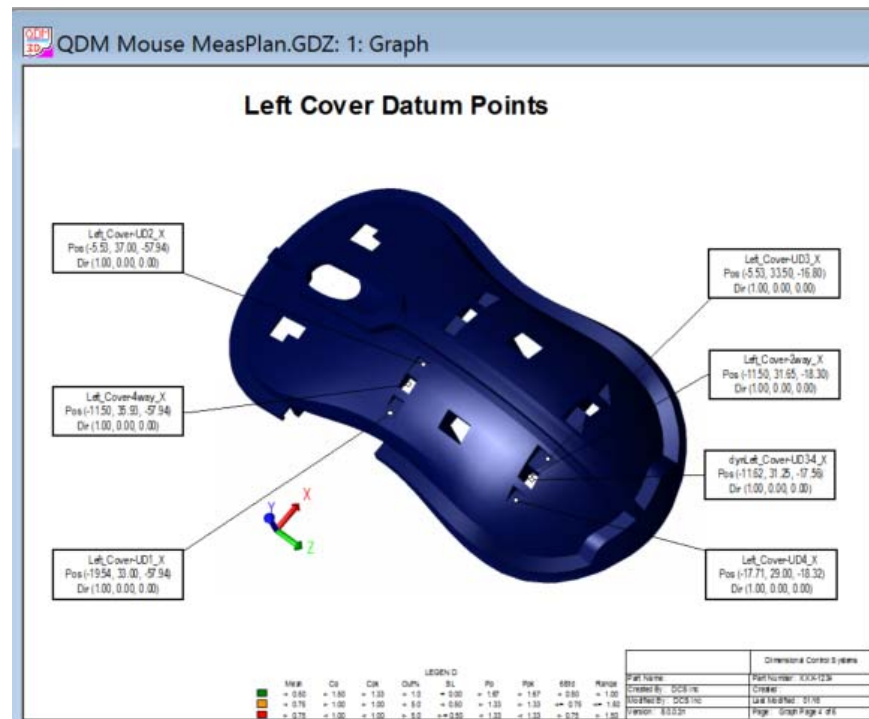
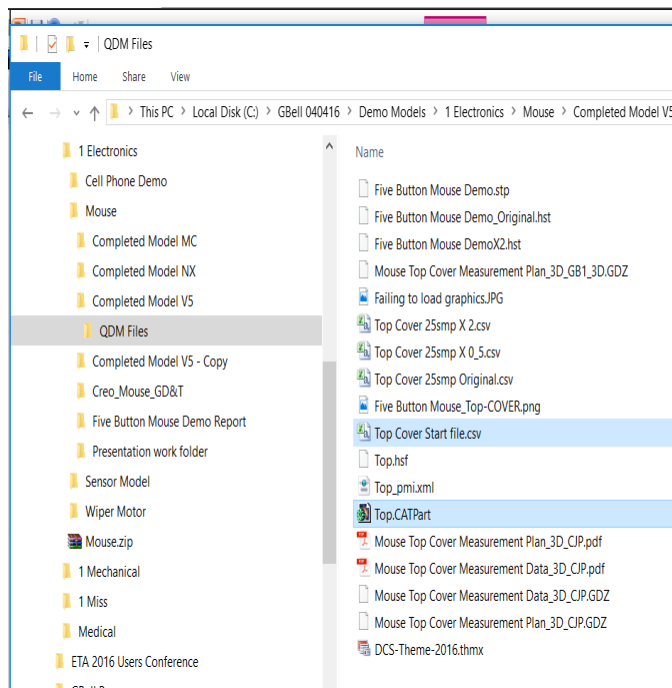
How do we close the loop?

- Export a data file for all points in the part



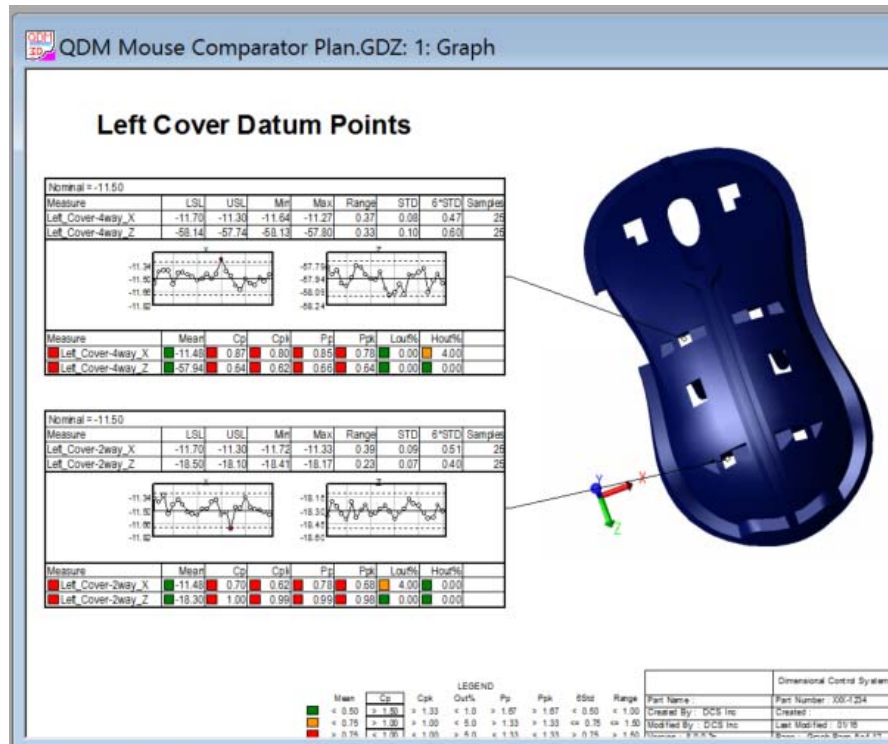
How do we close the loop?

- Import the Data file and the Cad file into QDM and generate a measurement plan



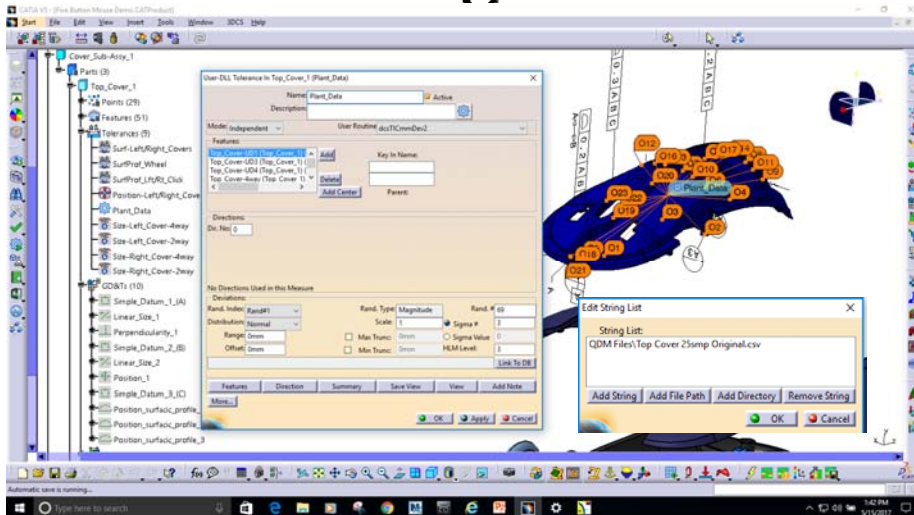
How do we close the loop?

- Duplicate the measurement plane report and modify it to begin receiving plant data



How do we close the loop?

- 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

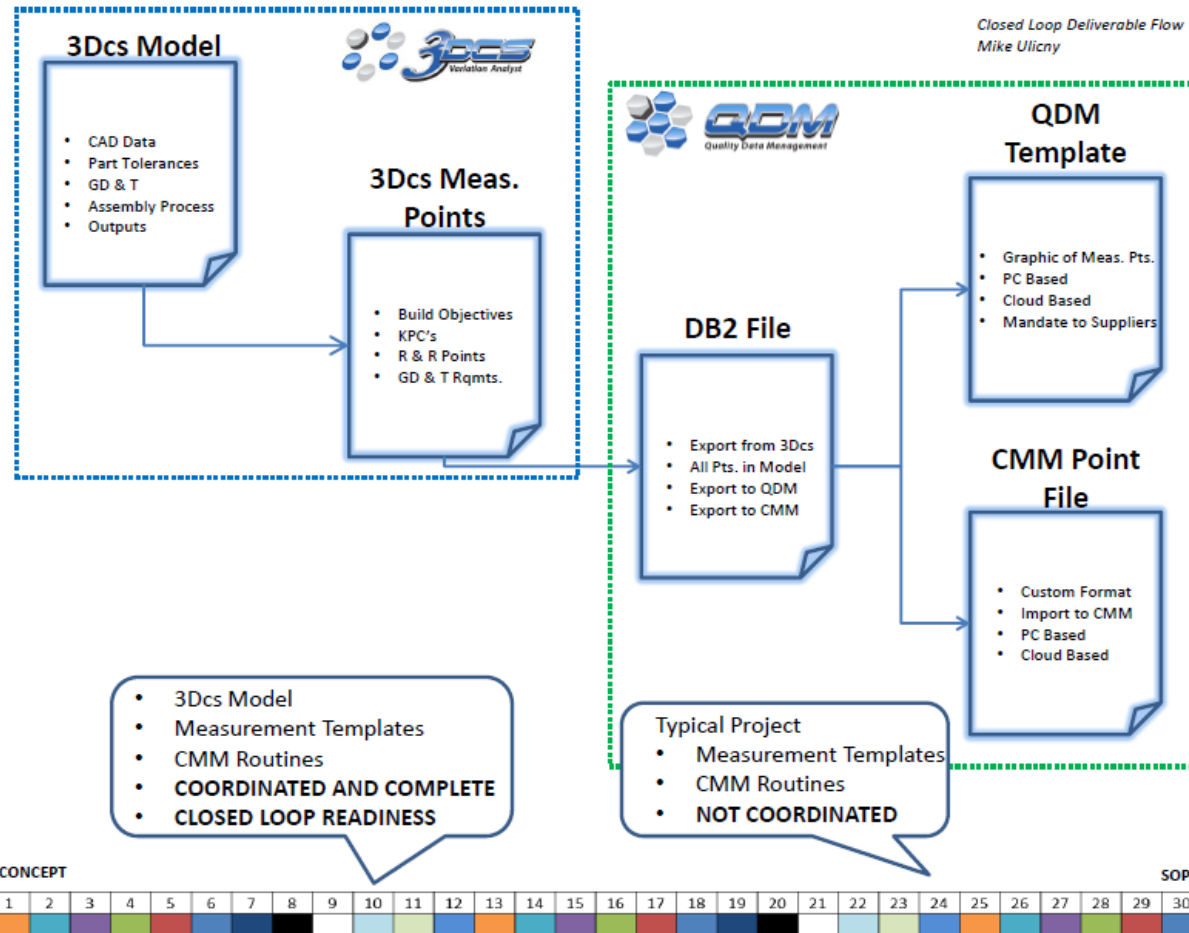


- Rerun Simulation Results

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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