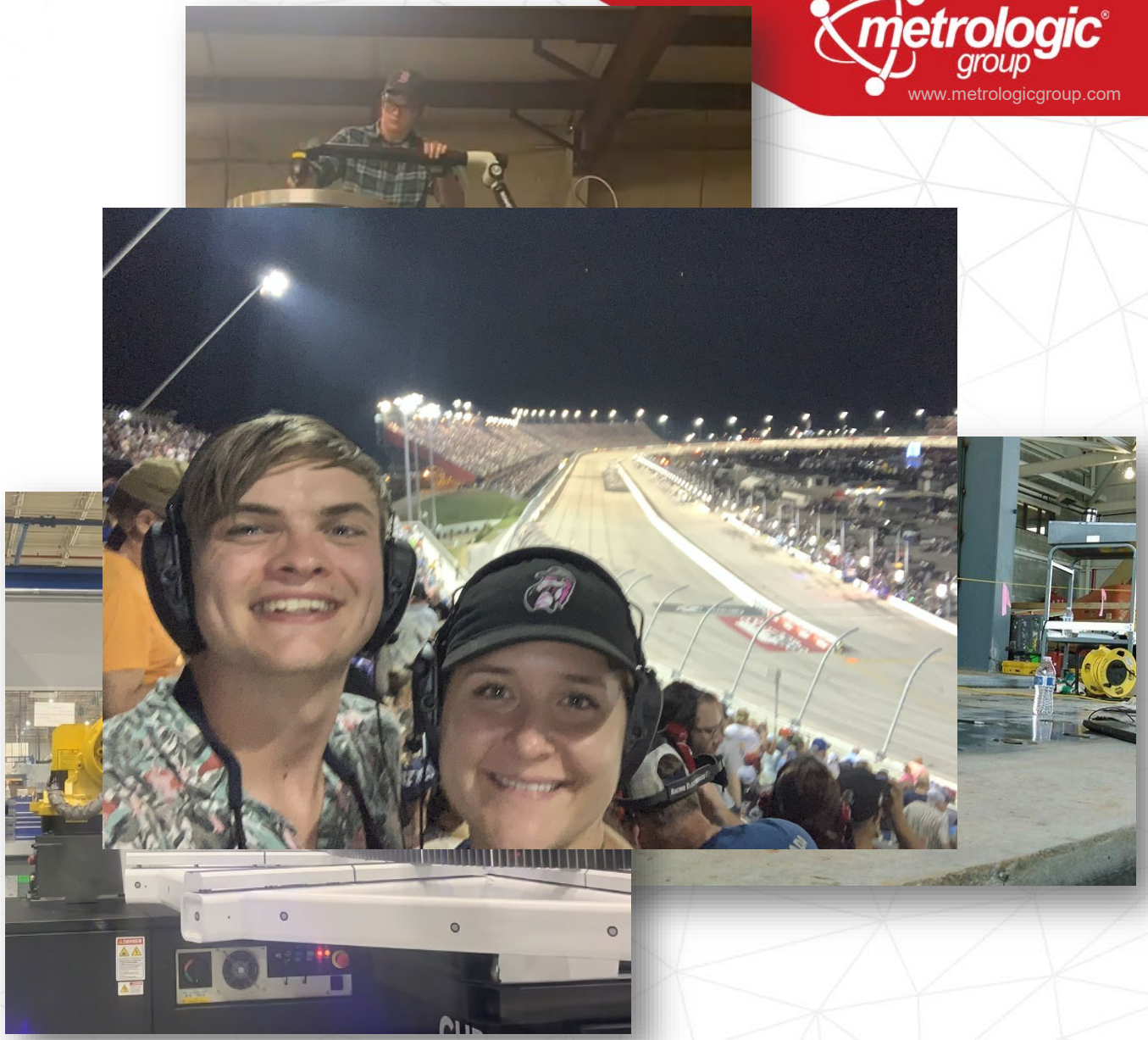
Optimizing Measurement through QIF Consumption

Alex Clement

Alex Clement

10 years in Dimensional Metrology

Experience in Aerospace, Energy, Manufacturing, Defense, and Shipbuilding



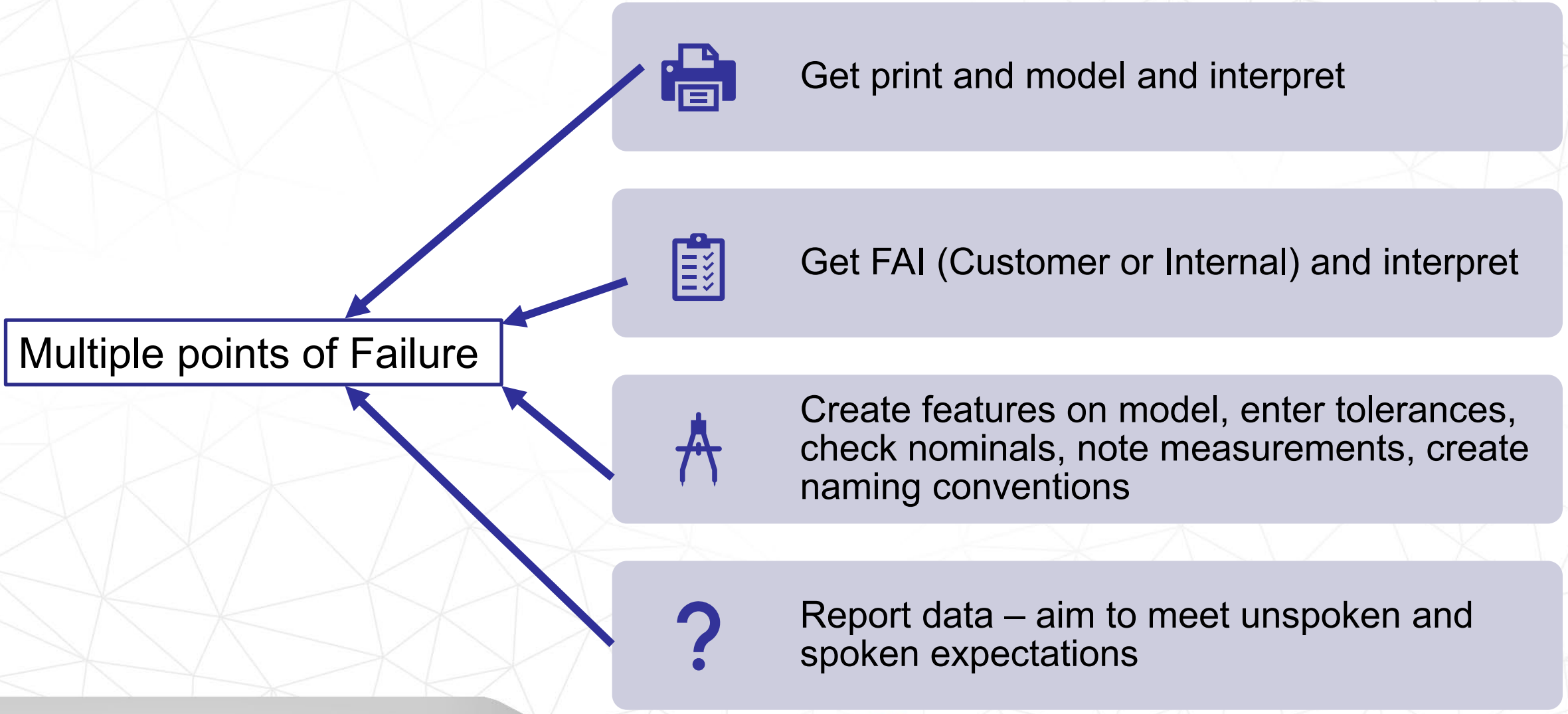
QIF as a standard

Standards give common ground to build trust, discuss needs, and agree on outcomes

QIF acts as a standard to build trust through Industry 4.0

Standards should ultimately benefit those who follow, not burden them.

Traditional programming pattern



How QIF improves People in the Metrology process

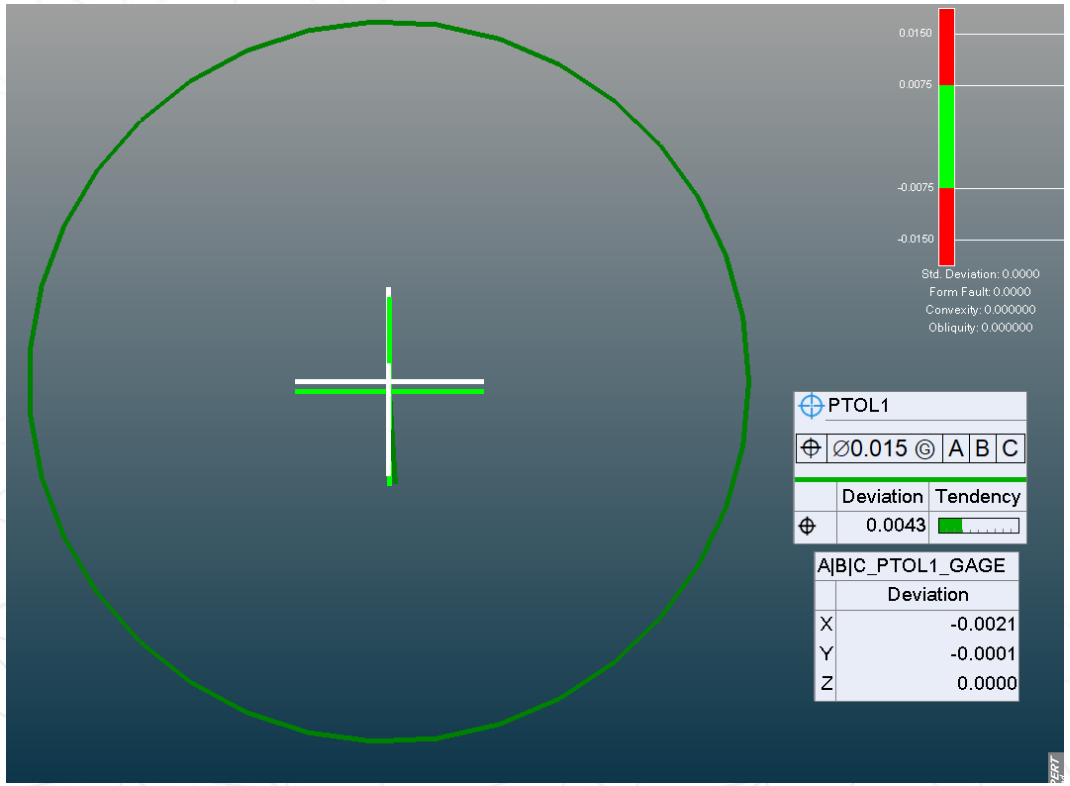
REMOVES A DEGREE OF INTERPRETATION FROM GD&T

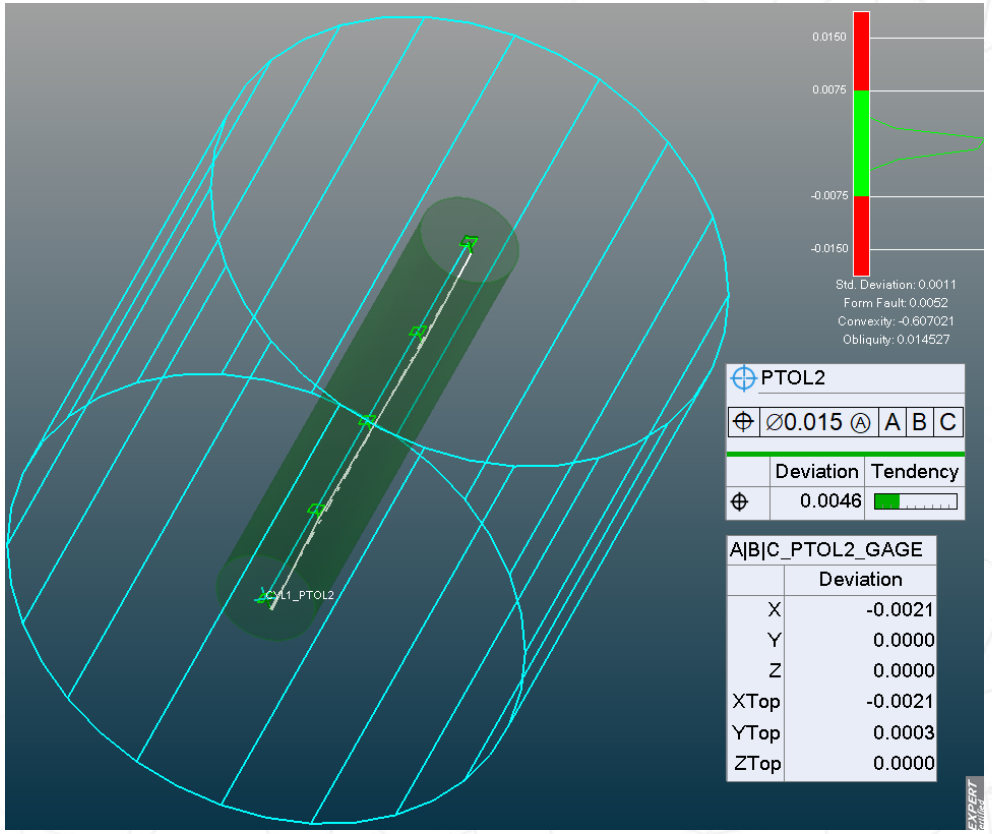
SIMPLIFICATION OF REPORTING AND NOMENCLATURE

CREATES A POWERFUL MEANS OF COLLABORATION FOR THE MEASUREMENT PROCESS

Controlling GD&T Interpretation

⌖	∅0.015 Ⓐ	A	B	C



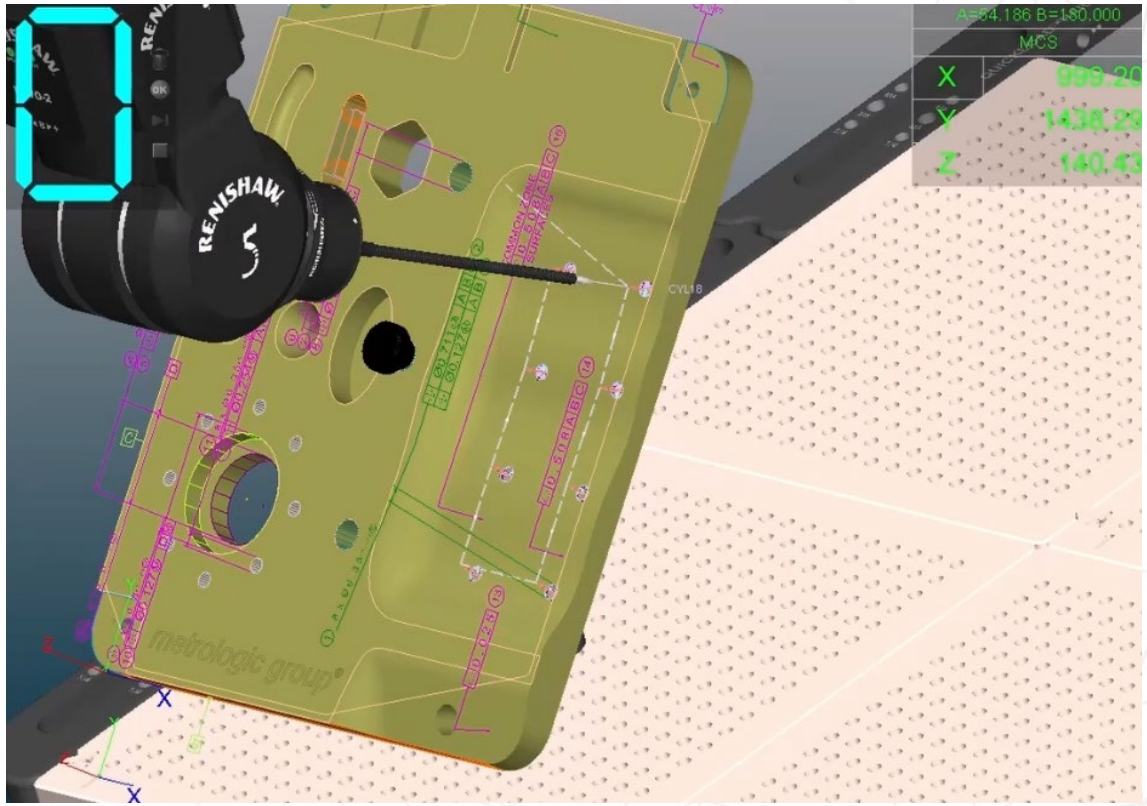


FAI and inter-company nomenclature

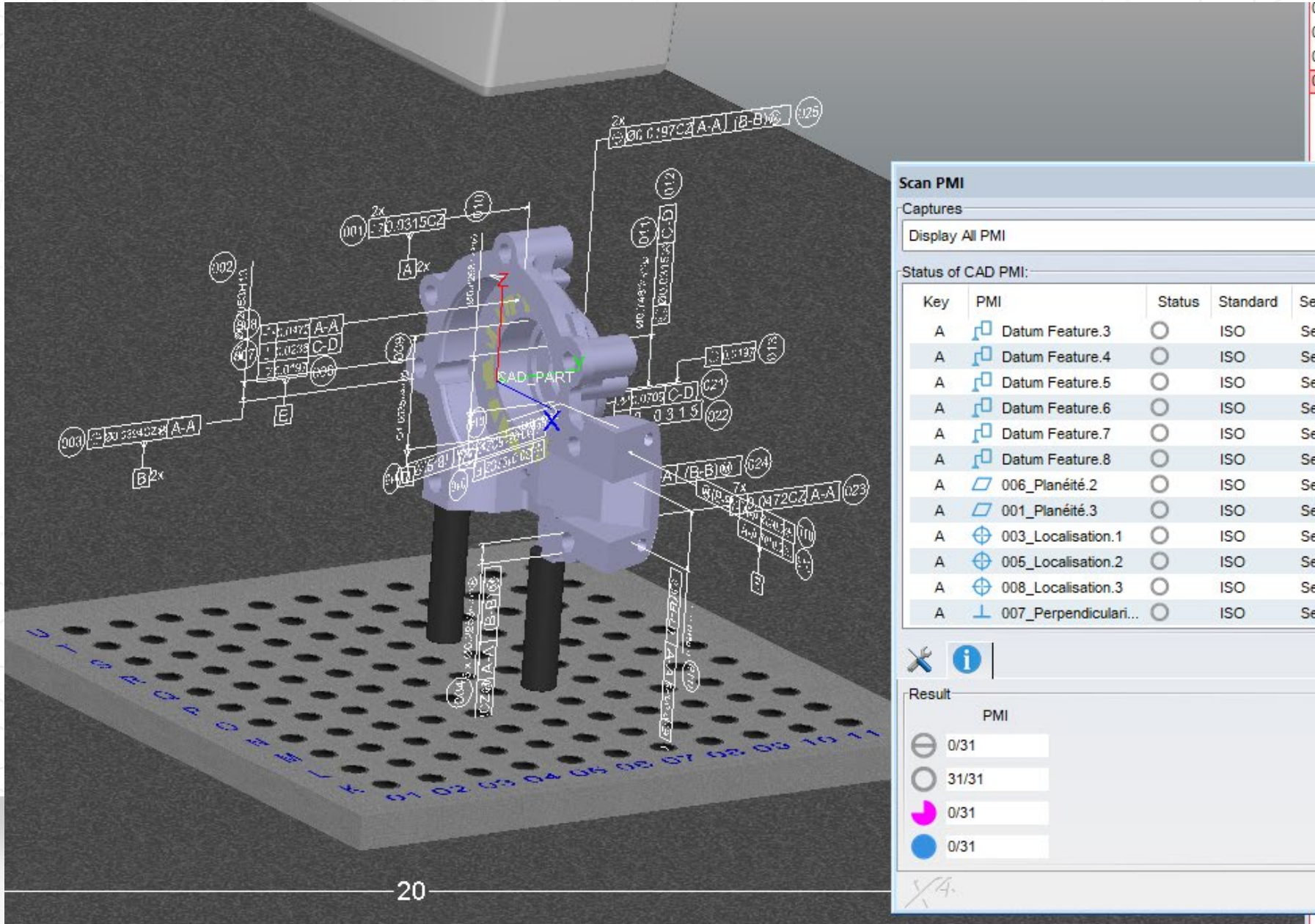
- QIF directs interpretation of the naming of specific features and elements
- Removes middlemen from measurement and part interpretation
- Gives a new avenue to discuss internally, and externally about conforming and non-conforming results
- Removes room for bad actors to influence decisions in quality evaluation

Winning at the CMM with QIF

- Premade file of features, tolerances, GD&T interpretations
- More time to focus on path planning and good metrology
- Less variables to deprecate value of quality data



Collecting Features and GD&T from PMI



00001	Start
00002	Setup
00009	Manual alignment
00013	End

Scan PMI

Captures

Display All PMI

Status of CAD PMI:

Key	PMI	Status	Standard	Semanticity	Usability
A	Datum Feature.3		ISO	Semantic	Usable
A	Datum Feature.4		ISO	Semantic	Usable
A	Datum Feature.5		ISO	Semantic	Usable
A	Datum Feature.6		ISO	Semantic	Usable
A	Datum Feature.7		ISO	Semantic	Usable
A	Datum Feature.8		ISO	Semantic	Usable
A	006_Planéité.2		ISO	Semantic	Usable
A	001_Planéité.3		ISO	Semantic	Usable
A	003_Localisation.1		ISO	Semantic	Usable
A	005_Localisation.2		ISO	Semantic	Usable
A	008_Localisation.3		ISO	Semantic	Usable
A	007_Perpendiculari...		ISO	Semantic	Usable

Result

PMI
0/31
31/31
0/31
0/31

Close

Silma X4 V20 GA HF4 (64 bits) - Serial Number: #28721 - Working Session - 3D-View

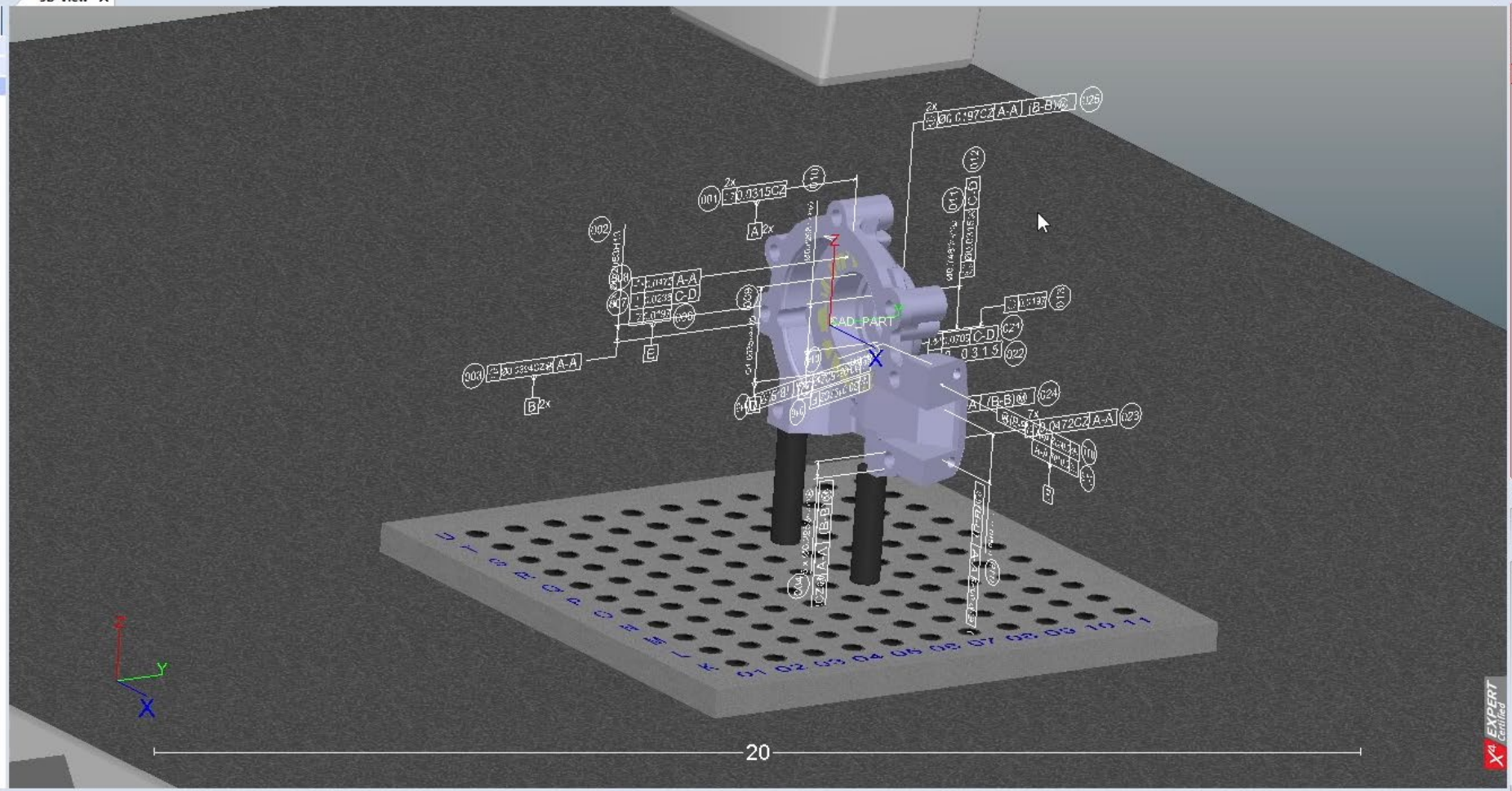
Working Session | Tools | Measuring Device | Probes | Features | Point Cloud | CAD | Alignments | Program | Workcell | 3D-View | Windows | ?

MCS | Standard | *Defau | A | 1#A0.0_B0.0

Workcell

- Workcell
  - Default
    - *Default
      - PH20
  - Connection1
    - Connection1
  - RC10x10
  - 0.5SO2
  - 0.5SO2.1
  - CAD

3D-View



Program_1

00001		Start
00002		Setup
00009		Manual alignment
00013		End

Scan PMI

Captures: Display All PMI

Status of CAD PMI:

Key	PMI	Status	Standar
A	Datum Feature.3		ISO
A	Datum Feature.4		ISO
A	Datum Feature.5		ISO
A	Datum Feature.6		ISO
A	Datum Feature.7		ISO
A	Datum Feature.8		ISO

RO (Default)

X	0.0000
Y	0.0000
Z	-6.4094

Results

Dim/Pos	Actual	Nominal	Iso	Tol-	Tol+	Deviation	Tendency	Out of Tol.	State

Result

PMI

0/31

31/31

0/31

0/31

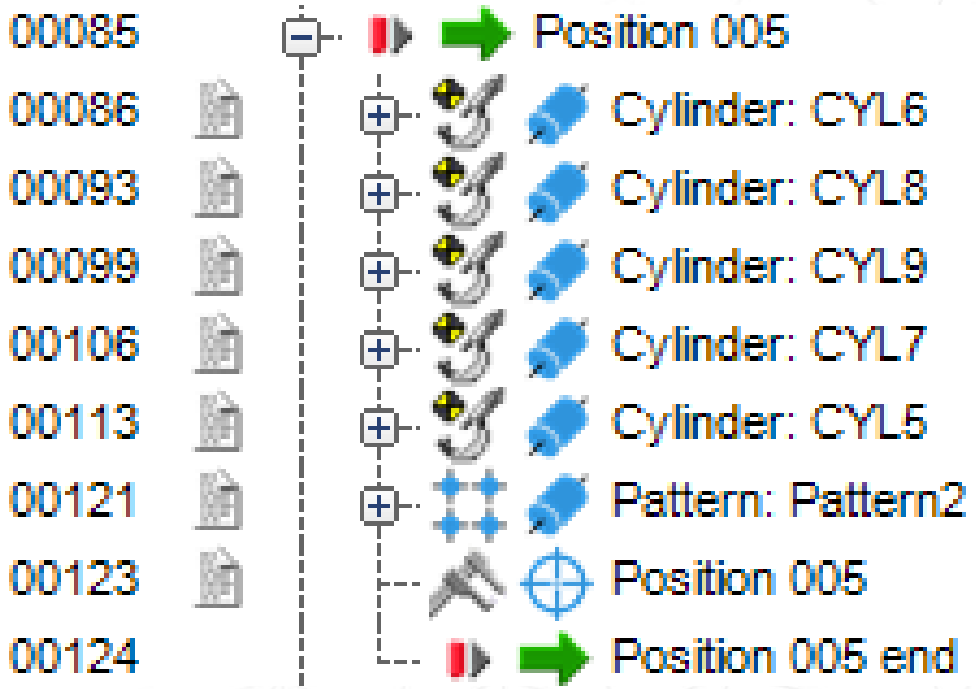
Close

in | DEG | OFF

Program building with QIF

- Reading of QIF or PMI into an ordered, structured, base program

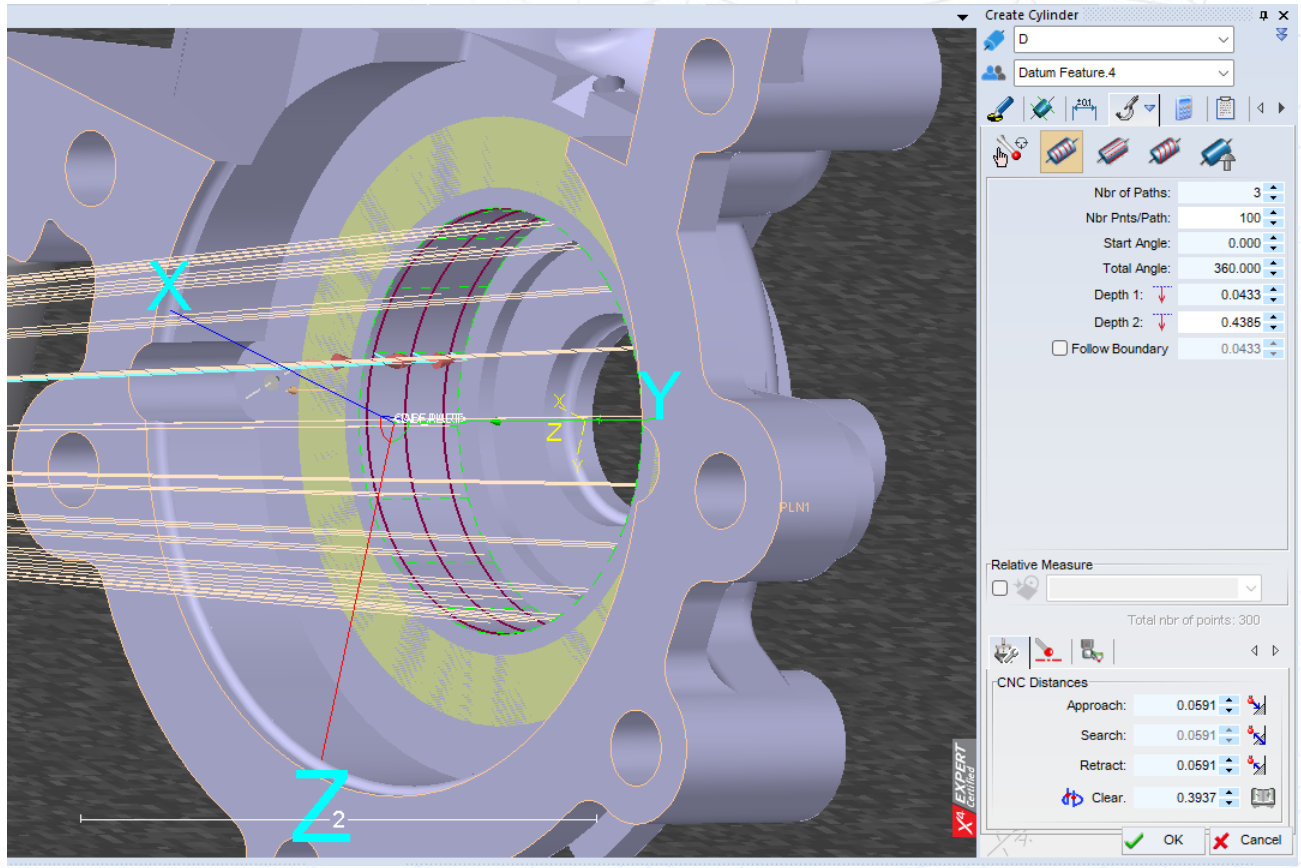
- Leaves path planning and measurement parameters for completion



Rules not Burdens

- Rules for measurement ought to determine elements about data quantity, location, acceptable methods

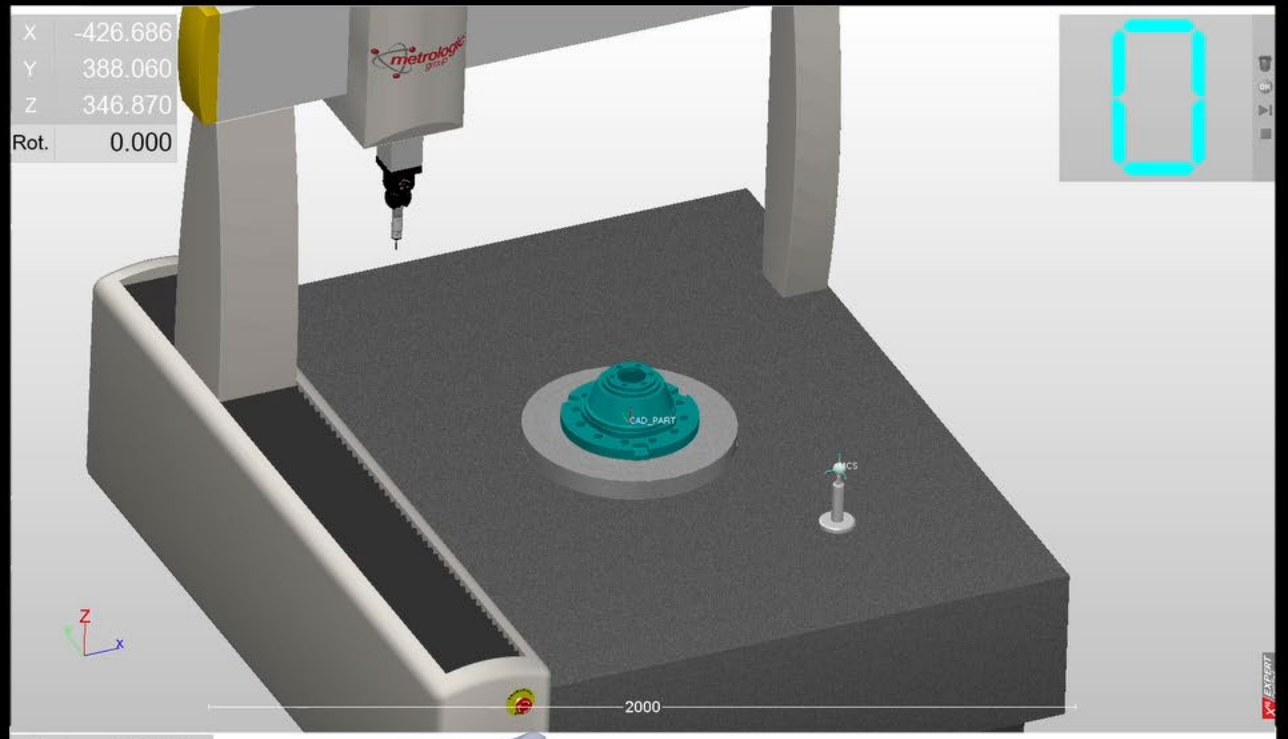
- Rules that are too granular become an burden rather than a guide

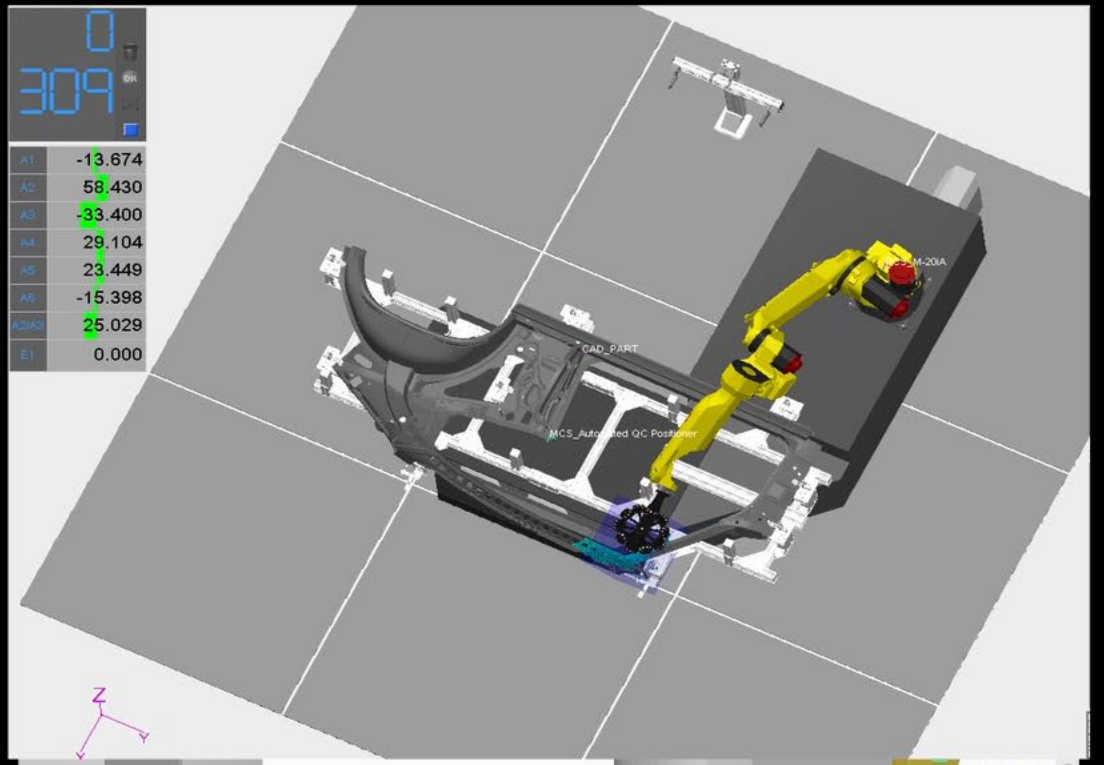


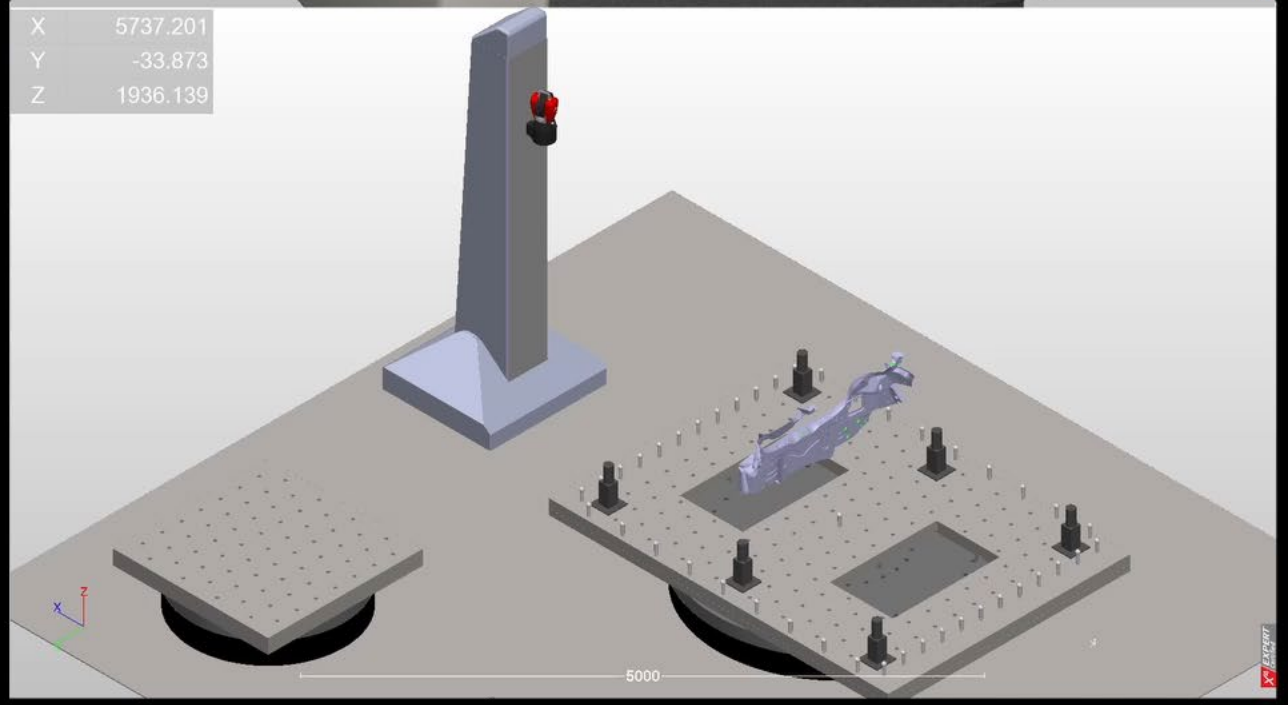
A Renewed Focus on Metrology

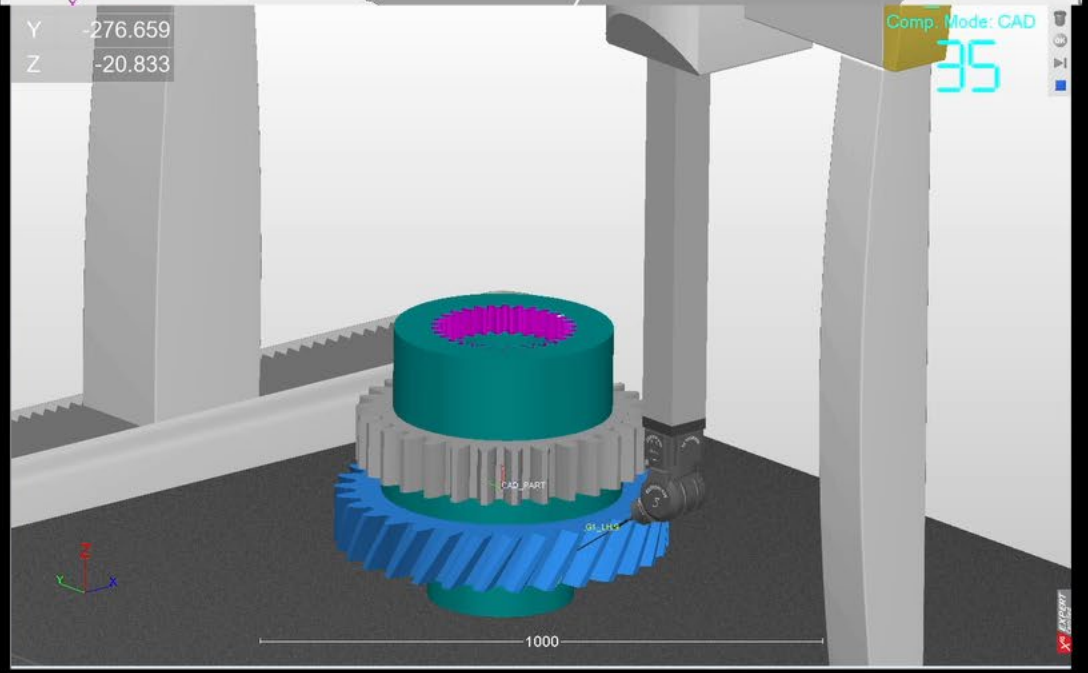
Through QIF consumption, it lets the metrologist focus on metrology

Device performance – environment – throughput – process control are all further enabled using QIF!


X -426.686
Y 388.060
Z 346.870
Rot. 0.000
CAD_PART
MCS
2000


309
A1 -13.674
A2 58.430
A3 -33.400
A4 29.104
A5 23.449
A6 -15.398
A2/A3 25.029
E1 0.000
CAD_PART
MCS_Automated QC Positioner


X 5737.201
Y -33.873
Z 1936.139
5000


Y -276.659
Z -20.833
Comp. Mode: CAD
95
CAD_PART
1000

THANK YOU!