

Engineering Data Quality

Allowing the digital age to work
for us and not against us

Jonathon Sutton

GLOBAL PRODUCT DATA INTEROPERABILITY SUMMIT 2023



Jonathon Sutton – Engineering Technical Specialist, Airplane Level Engineering Integration (ALEI)



As a member of Boeing's ALEI MBDef team, he has had the privilege of working with their data quality solutions team to develop a data quality solution that will be integrated into the future modeling software for the company. He brings over 13+ years experience with production systems as well as his data quality expertise. From the start of his career at the Boeing company he has been involved with numerous data quality projects, like the NTChecklist, iCheckit, CheckMBD, and ZECAD tools and lot's more. Data quality is something that he is passionate about, but ending the need for unnecessary data quality validation is where his true passion resides.

What is Engineering Data and Data Quality?

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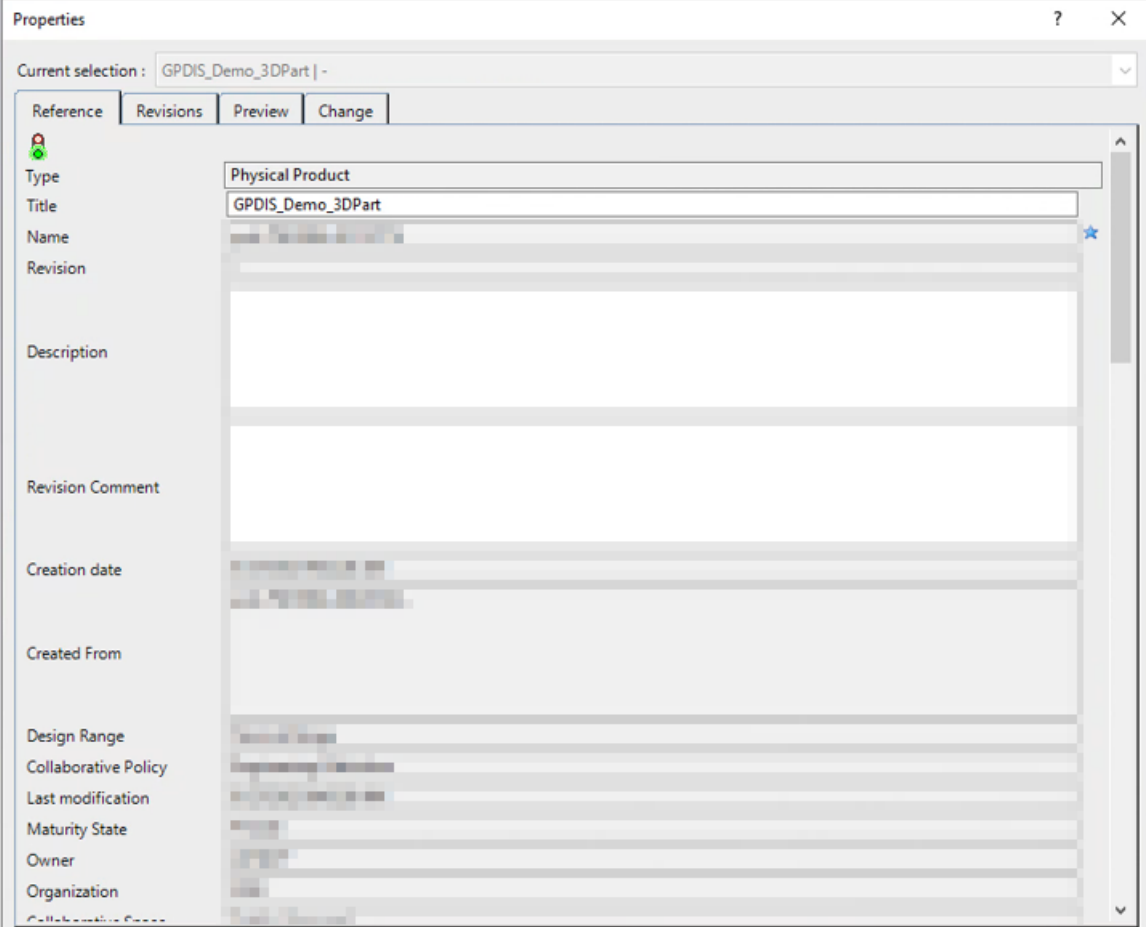
Engineering Data is a necessary part of what we do everyday

What is Engineering Data and Data Quality?

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- **Engineering Data Quality is...**
 - **Attributes**

Engineering Data is a necessary part of what we do everyday



The screenshot shows a 'Properties' dialog box for a CAD part named 'GPDIS_Demo_3DPart'. The dialog has tabs for 'Reference', 'Revisions', 'Preview', and 'Change'. The 'Reference' tab is active, showing a tree view of the part's metadata. The 'Type' is 'Physical Product' and the 'Title' is 'GPDIS_Demo_3DPart'. Other fields include 'Name', 'Revision', 'Description', 'Revision Comment', 'Creation date', 'Created From', 'Design Range', 'Collaborative Policy', 'Last modification', 'Maturity State', 'Owner', and 'Organization'. The 'Name' field has a blue star icon next to it. At the bottom right, there are 'More...', 'OK', 'Apply', and 'Close' buttons.

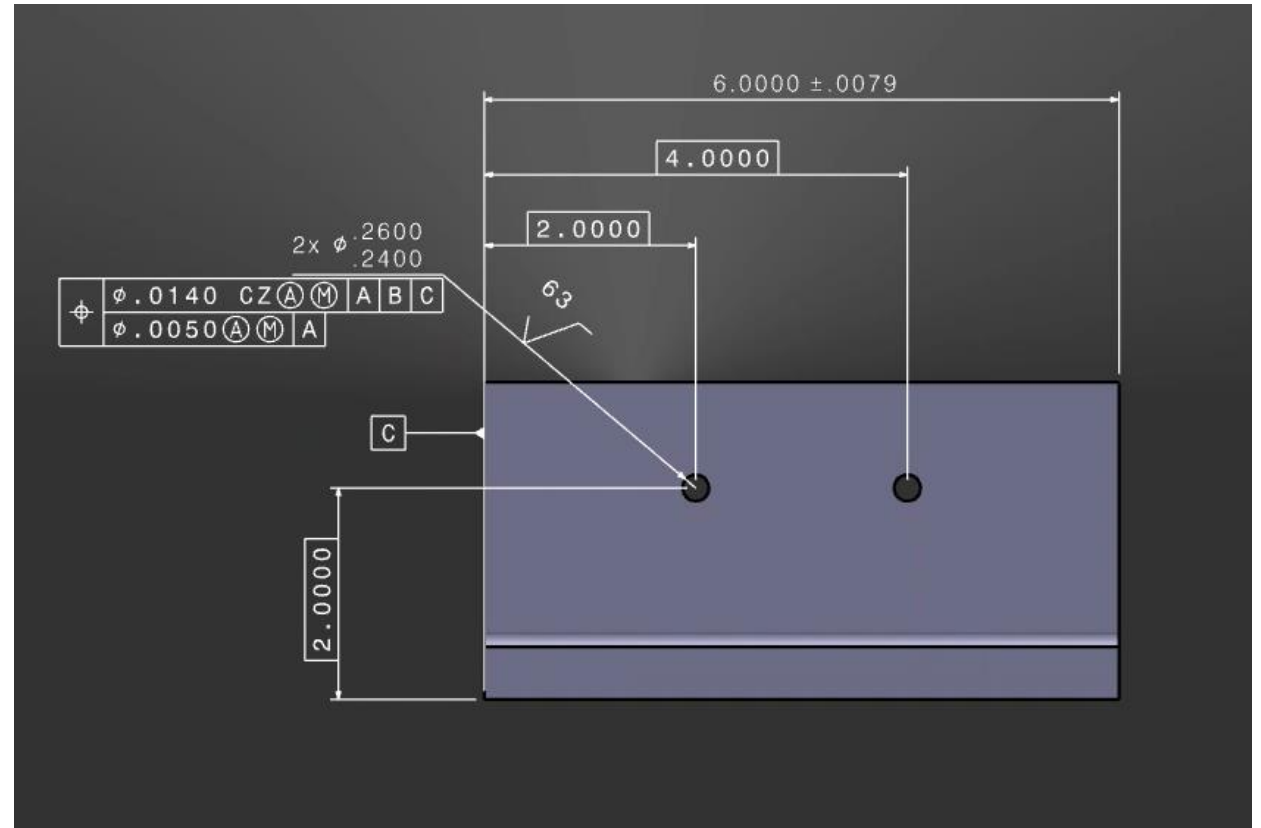
Property	Value
Type	Physical Product
Title	GPDIS_Demo_3DPart
Name	[Redacted]
Revision	[Redacted]
Description	[Redacted]
Revision Comment	[Redacted]
Creation date	[Redacted]
Created From	[Redacted]
Design Range	[Redacted]
Collaborative Policy	[Redacted]
Last modification	[Redacted]
Maturity State	[Redacted]
Owner	[Redacted]
Organization	[Redacted]

What is Engineering Data and Data Quality?

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- **Engineering Data Quality is...**

- **Attributes**
- **Annotation**



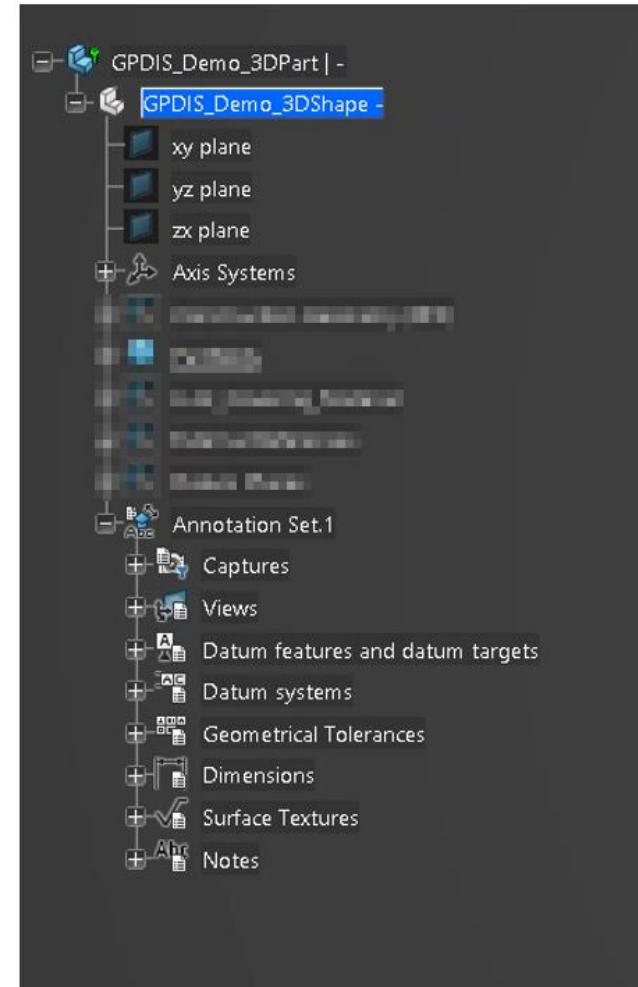
Engineering Data is a necessary part of what we do everyday

What is Engineering Data and Data Quality?

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- **Engineering Data Quality is...**
 - **Attributes**
 - **Annotation**
 - **Organization**

Engineering Data is a necessary part of what we do everyday



Why is Engineering Data Quality an Issue?

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Time and effort spent dealing with
Engineering Data comes with cost

Why is Engineering Data Quality an Issue?

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- **It is an issue because...**
 - **Manual entry into multiple systems**

Time and effort spent dealing with Engineering Data comes with cost



Why is Engineering Data Quality an Issue?

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- **It is an issue because...**
 - Manual entry into multiple systems
 - Manual validation

Time and effort spent dealing with Engineering Data comes with cost

CHECKLIST

<input checked="" type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	_____
<input checked="" type="checkbox"/>	_____
<input checked="" type="checkbox"/>	_____
<input checked="" type="checkbox"/>	_____
<input type="checkbox"/>	_____

Why is Engineering Data Quality an Issue?

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- **It is an issue because...**
 - **Manual entry into multiple systems**
 - **Manual validation**
 - **Time consuming**



Time and effort spent dealing with Engineering Data comes with cost

What Are the Options?

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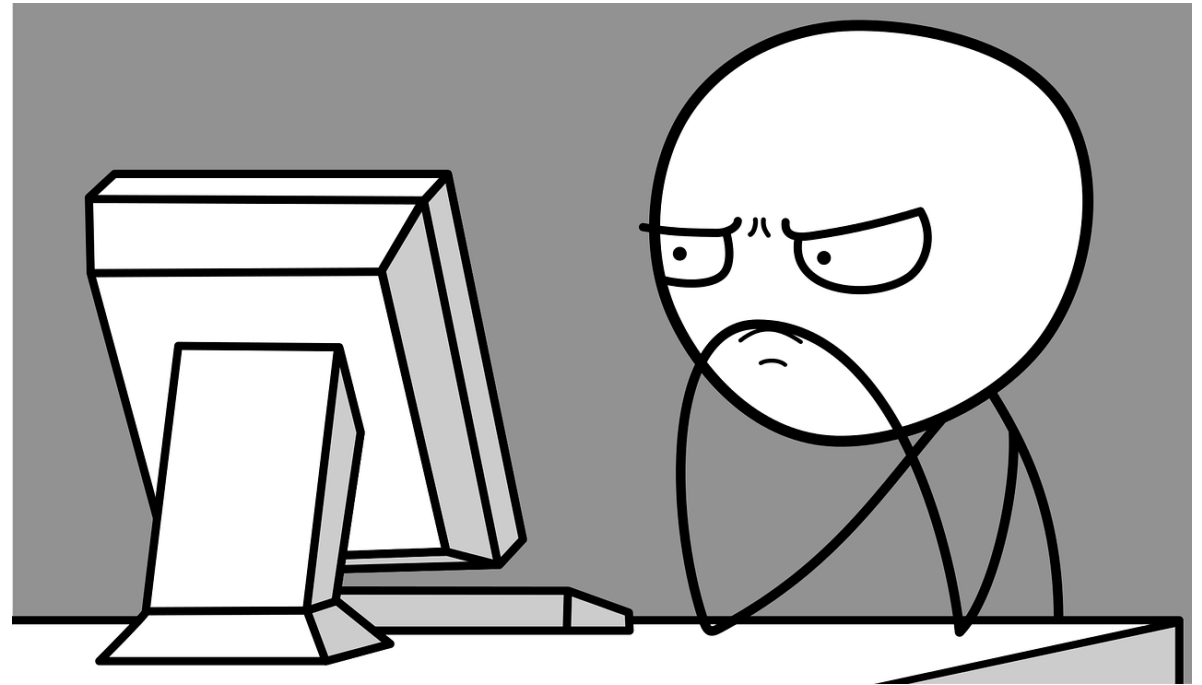
- **The fork in the road**



What Are the Options?

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- **The fork in the road**
 - Continue down same path



Continue wasting time with manual entry and validation.

What Are the Options?

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- **The fork in the road**
 - **Continue down same path**

Or

- **Figure out a better way**



Continue wasting time with manual entry and validation, or build the quality in.

What is the issue?

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- **What is the issue**



Minimize the entry of data validation and move validation of it during the engineering creation.

What is the issue?

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- **What is the issue**
 - **Post engineering vs. during engineering creation**



Minimize the entry of data validation and move validation of it during the engineering creation.

What is the issue?

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- **What is the issue**
 - **Post engineering vs. during engineering creation**
 - **No direct connection to the engineering data**



Minimize the entry of data validation and move validation of it during the engineering creation.

How do we do this?

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- **Lets explore the tools**
 - **3DExperience Apps**

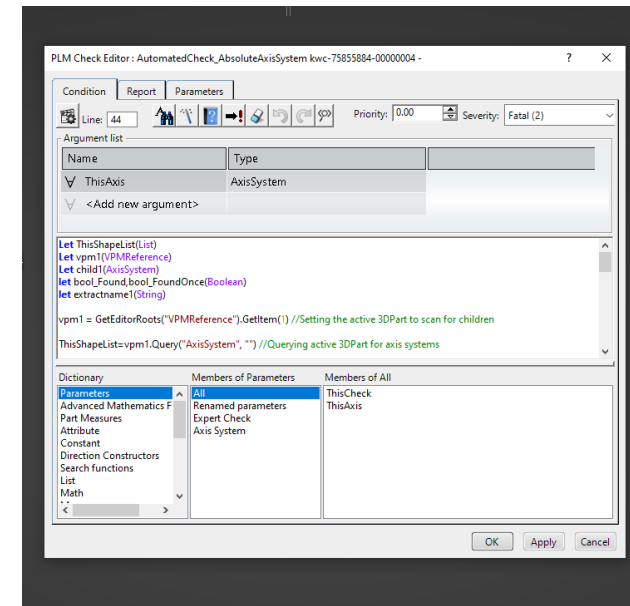


Continue wasting time with manual entry and validation, or build the quality in.

How do we do this?

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- Lets explore the tools
 - 3DExperience Apps
 - Engineering Knowledge Language (EKL)

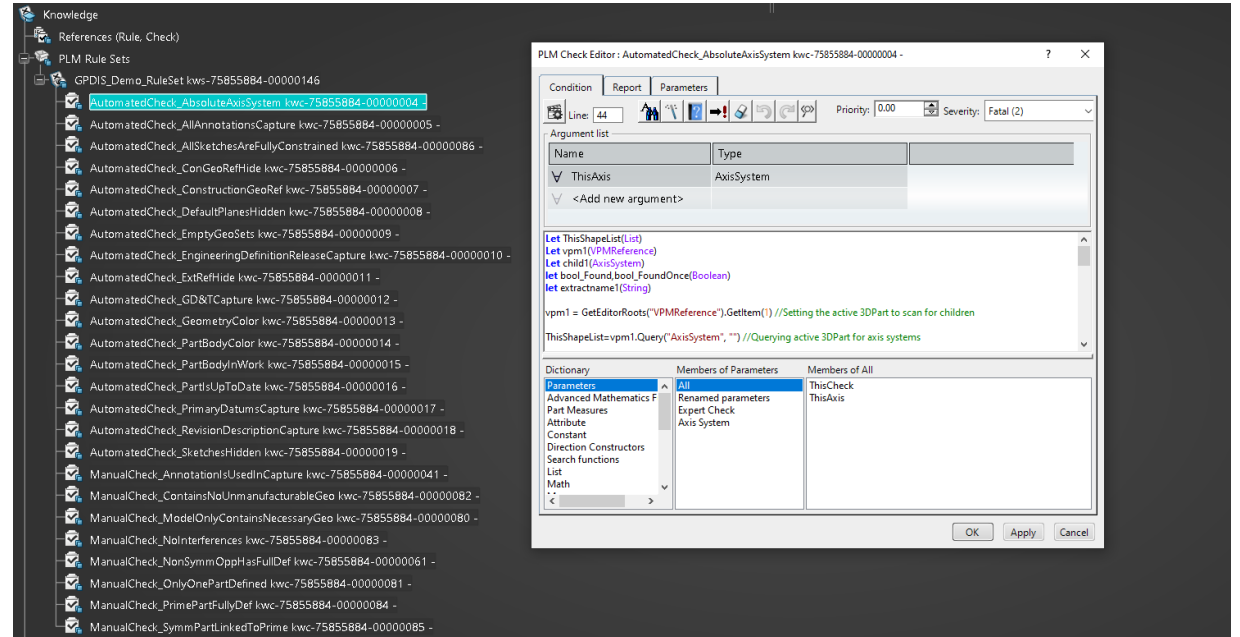


Continue wasting time with manual entry and validation, or build the quality in.

How do we do this?

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- Lets explore the tools
 - 3DExperience Apps
 - Engineering Knowledge Language (EKL)
 - Quality Rules Capture App

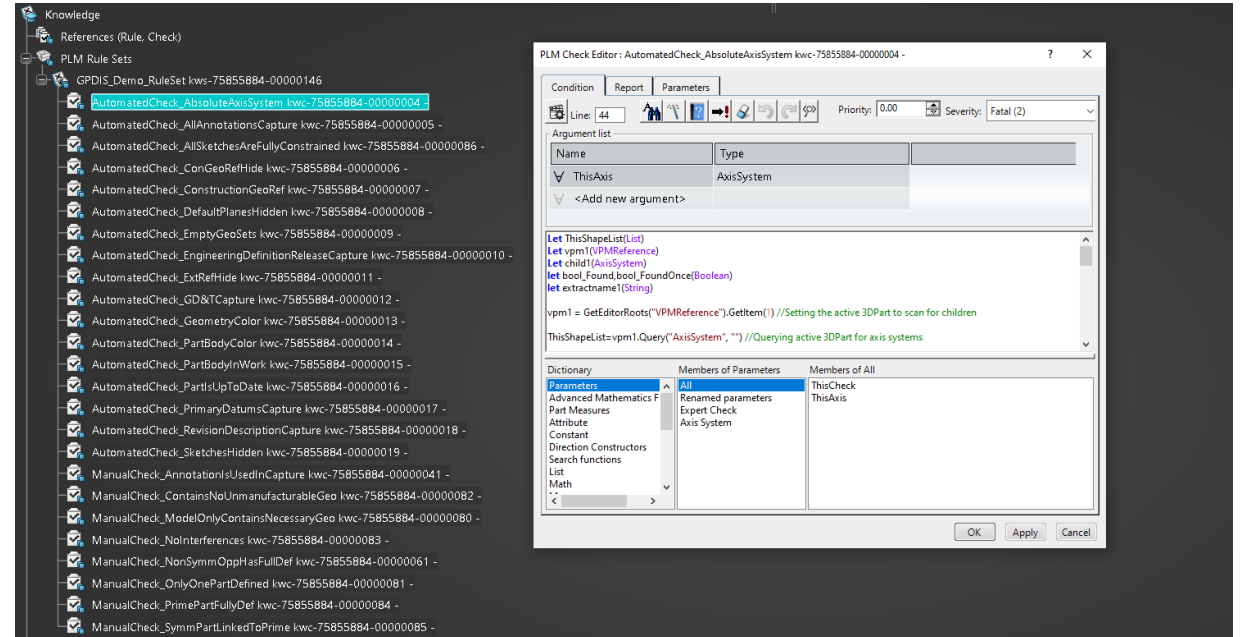


Continue wasting time with manual entry and validation, or build the quality in.

How do we do this?

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- Lets explore the tools
 - 3DExperience Apps
 - Engineering Knowledge Language (EKL)
 - Quality Rules Capture App
 - Automated



Continue wasting time with manual entry and validation, or build the quality in.

How do we do this?

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- **Lets explore the tools**
 - **3DExperience Apps**
 - Engineering Knowledge Language (EKL)
 - **Quality Rules Capture App**
 - Automated
 - Create the Check

Check

Check

Title: GPDISDemoCheck

Name: [blurred] ★

Description: [empty text area]

Language: Enterprise Knowledge Language

Manual Check: True False

Check Without Input: True False

Collaborative Policy: Engineering Resource

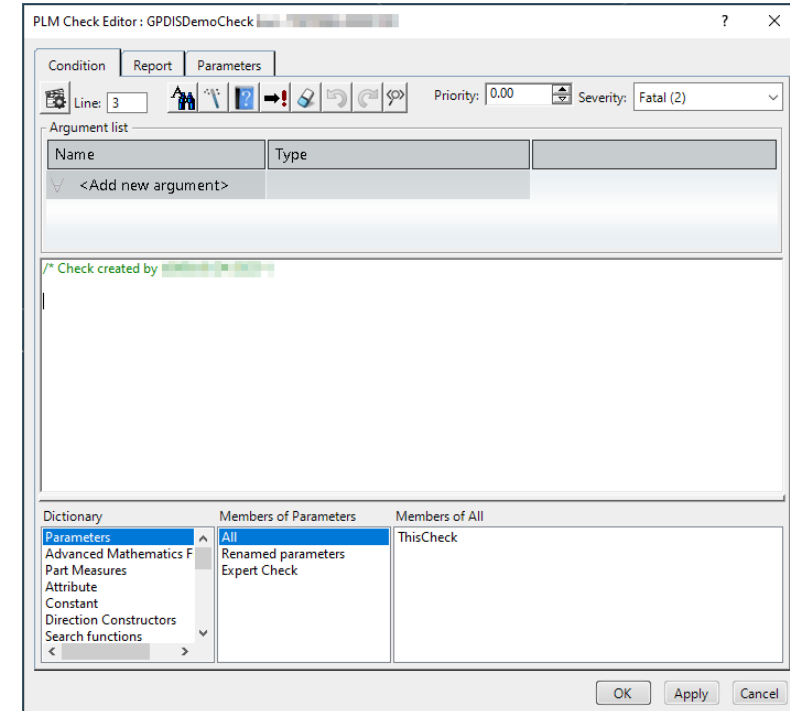
OK Cancel

Continue wasting time with manual entry and validation, or build the quality in.

How do we do this?

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- **Lets explore the tools**
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 - Automated
 - Create the Check
 - Define the Check

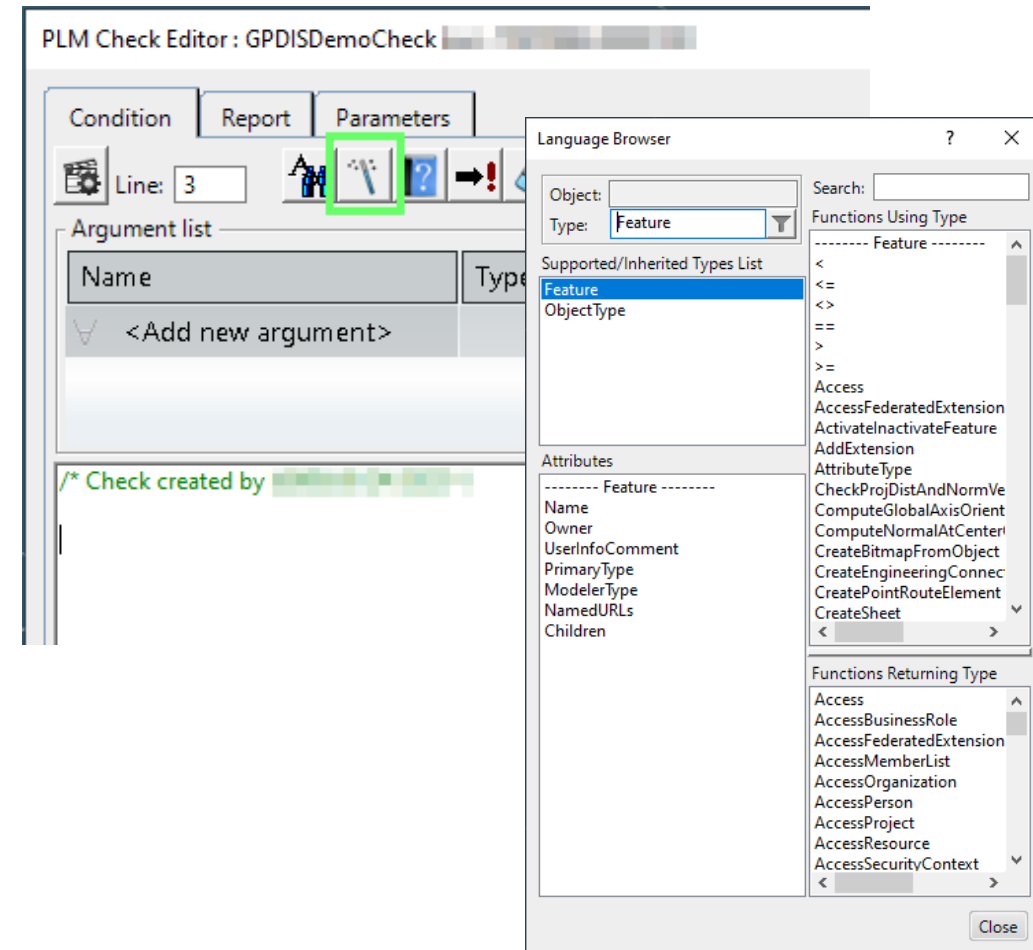


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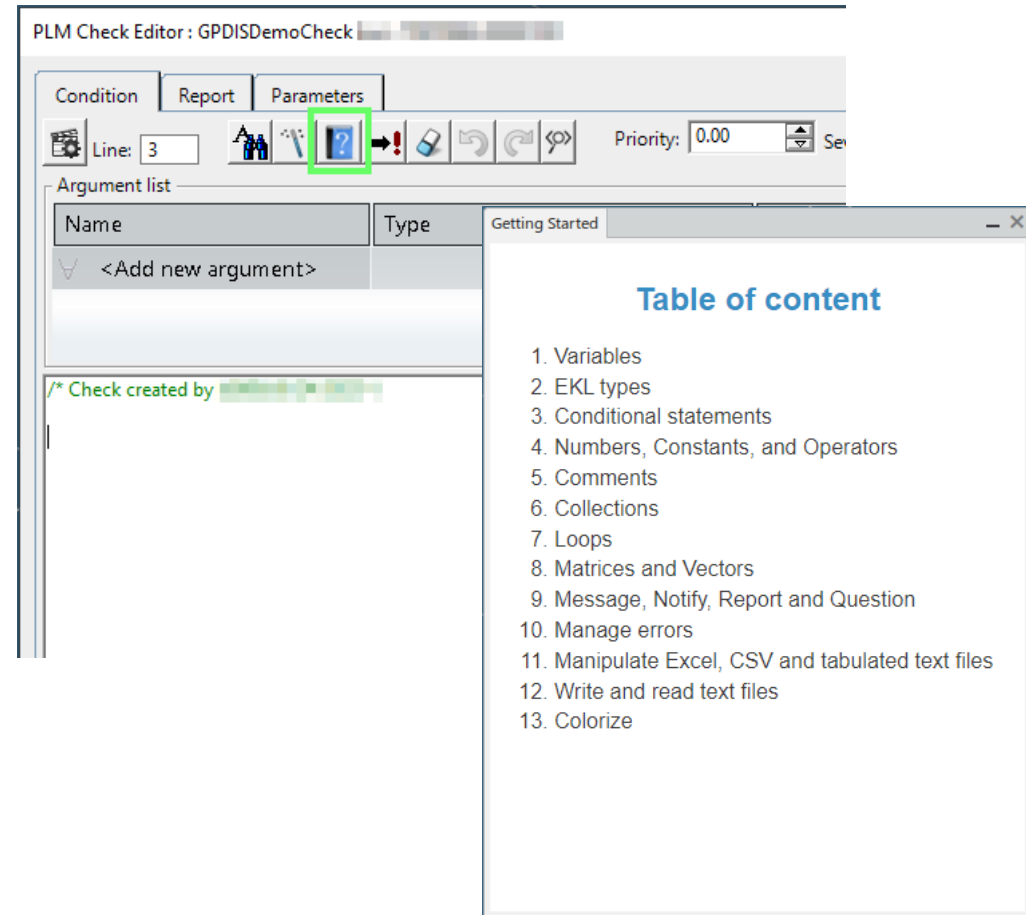


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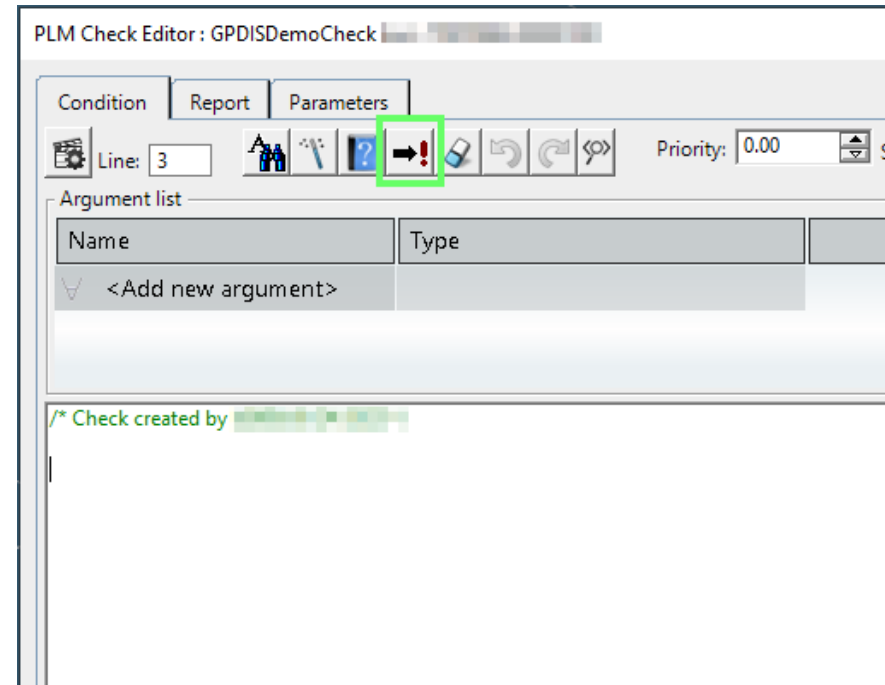


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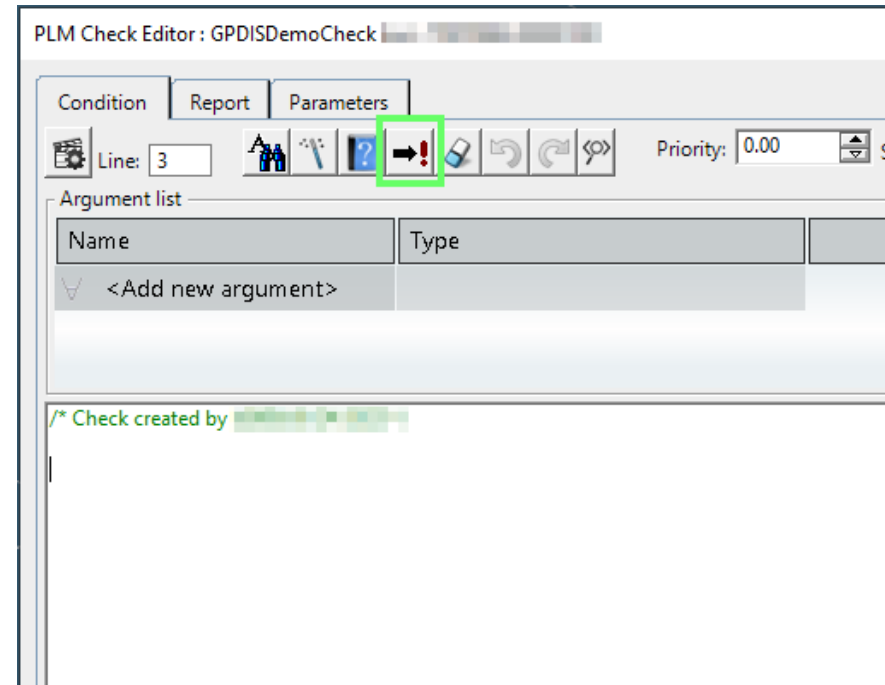


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 - Create the Check
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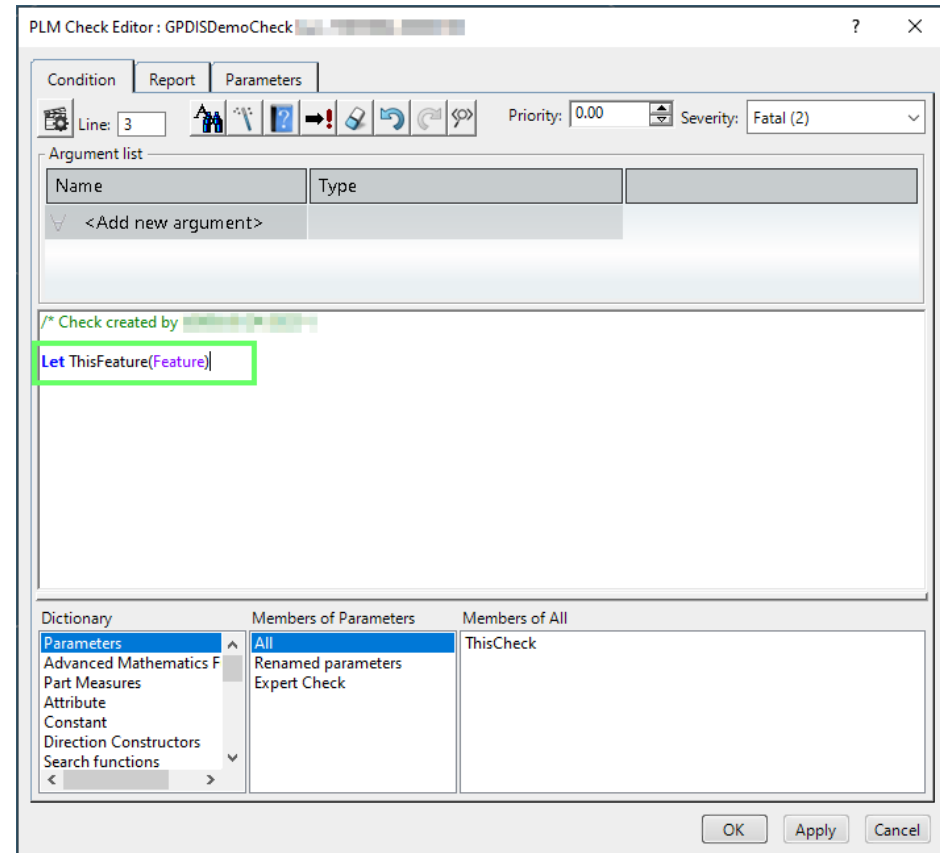
Continue wasting time with manual entry and validation, or build the quality in.

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 - Quality Rules Capture App
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 - Create the Check
 - Define the Check

Continue wasting time with manual entry and validation, or build the quality in.

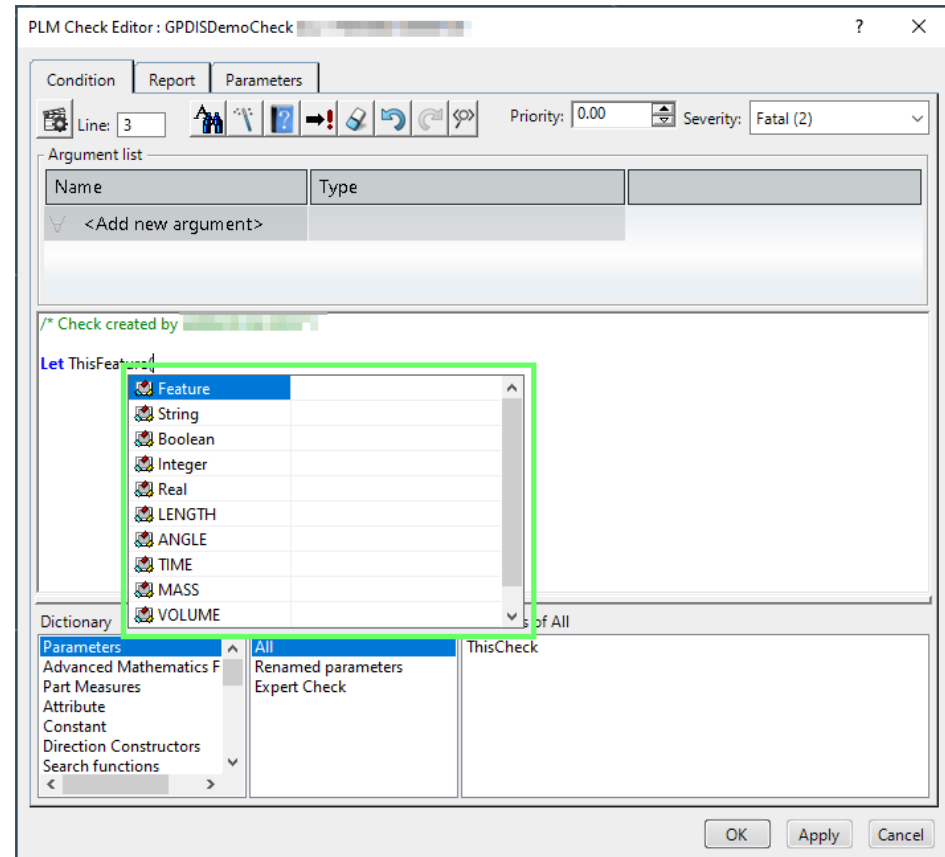


How do we do this?

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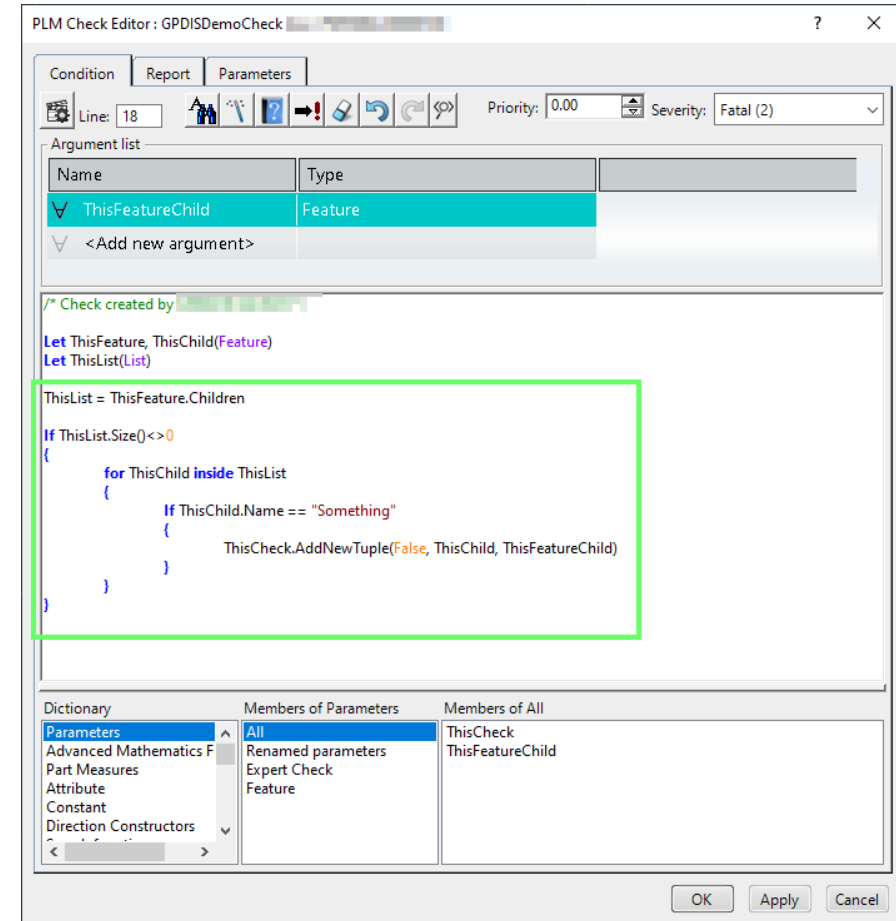


How do we do this?

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- Lets explore the tools
 - 3DExperience Apps
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 - Quality Rules Capture App
 - Automated
 - Create the Check
 - Define the Check

Continue wasting time with manual entry and validation, or build the quality in.



How do we do this?

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- **Lets explore the tools**
 - **3DExperience Apps**
 - Engineering Knowledge Language (EKL)
 - **Quality Rules Capture App**
 - **Automated**
 - Create the Check
 - Define the Check
 - **Manual**

Continue wasting time with manual entry and validation, or build the quality in.

How do we do this?

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- Lets explore the tools
 - 3DExperience Apps
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 - Quality Rules Capture App
 - Automated
 - Create the Check
 - Define the Check
 - Manual
 - Create the check

Check

Check

Title: GPDISManualCheck

Name: [blurred]

Description: [empty text area]

Language: Enterprise Knowledge Language

Manual Check: True False

Check Without Input: True False

Collaborative Policy: Engineering Resource

OK Cancel

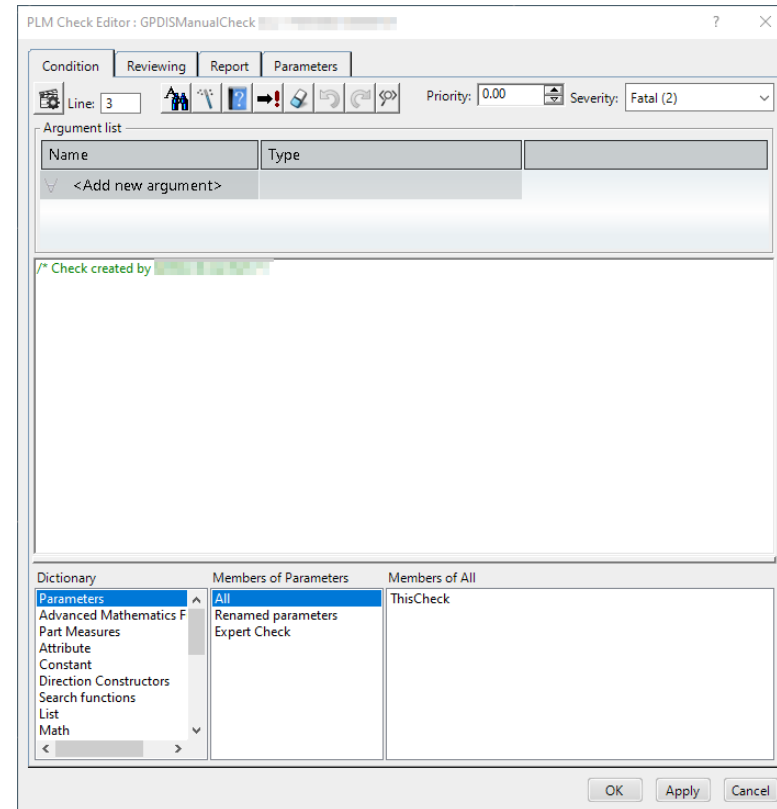
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 - Create the Check
 - Define the Check
 - **Manual**
 - Create the check
 - Define the check

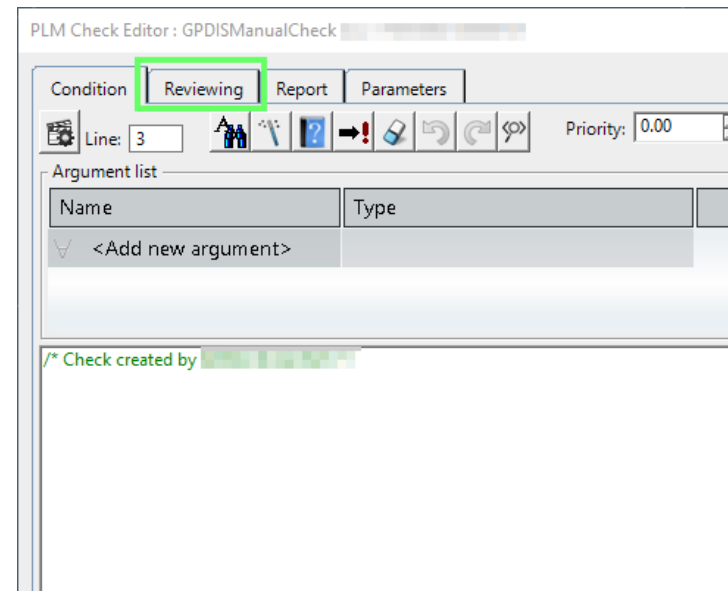
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 - Create the Check
 - Define the Check
 - Manual
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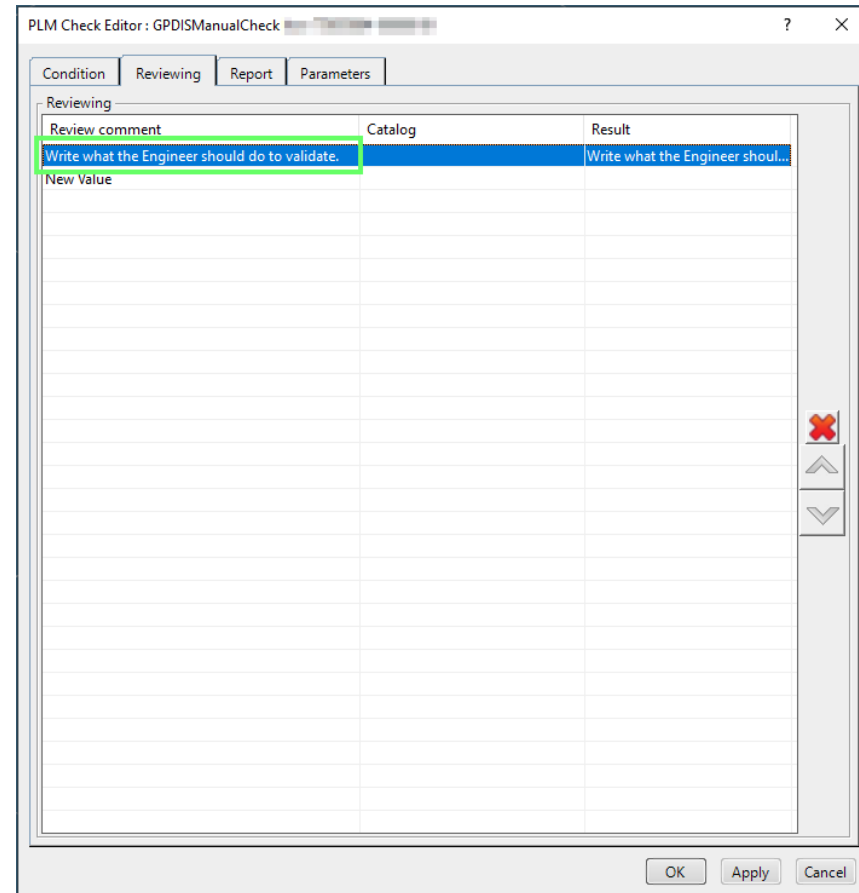
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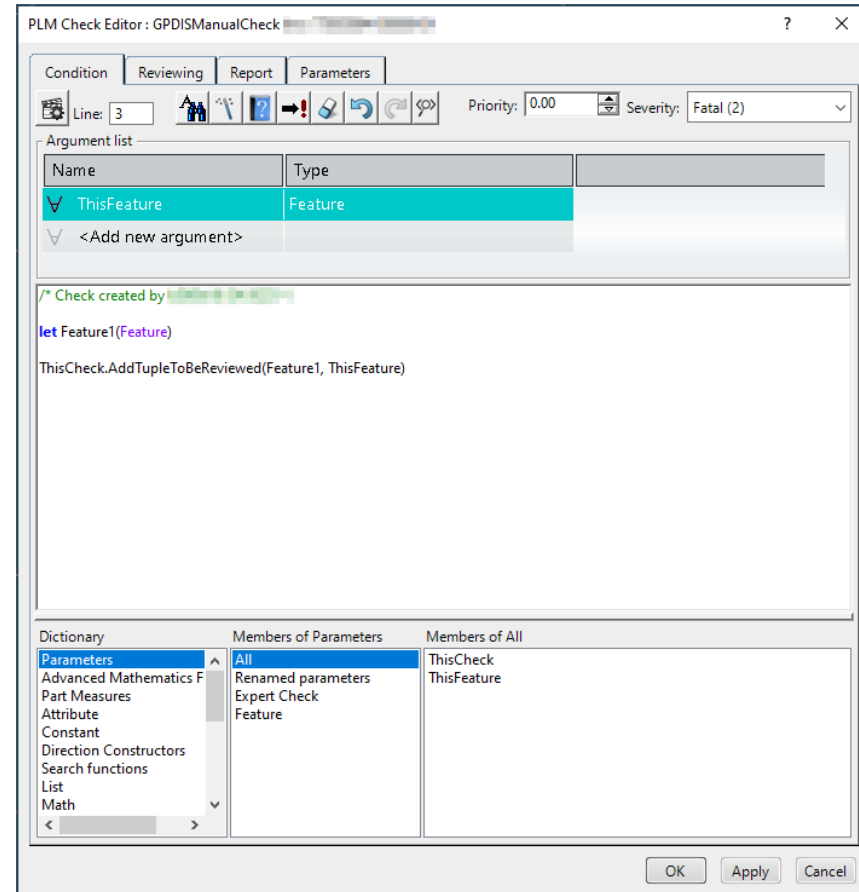


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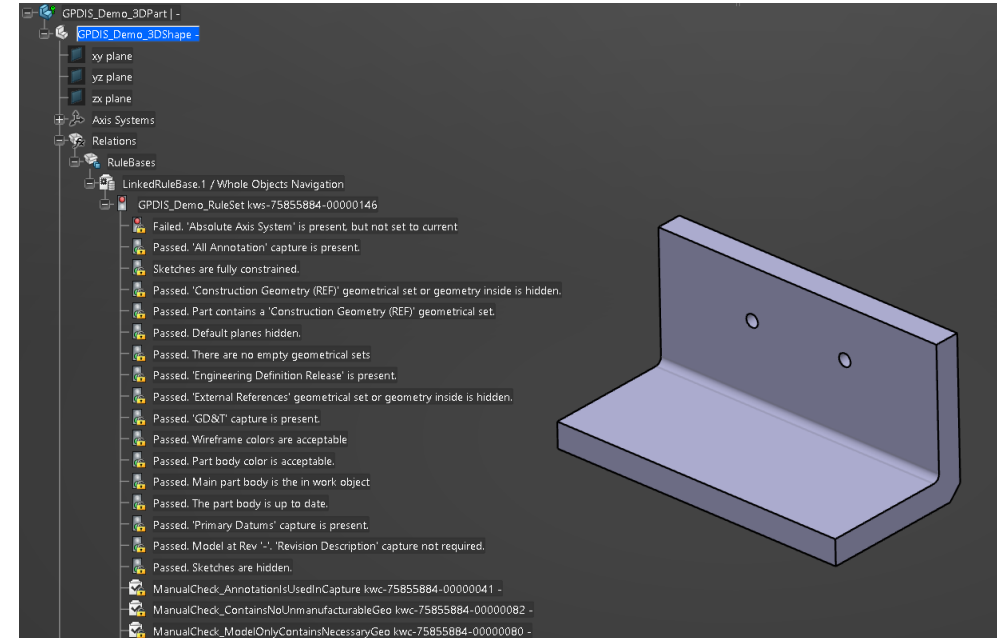
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- Lets explore the tools
 - 3DExperience Apps
 - Engineering Knowledge Language (EKL)
 - Quality Rules Capture App
 - Automated
 - Create the Check
 - Define the Check
 - Manual
 - Create the check
 - Define the check
 - Quality Rules Reuse App

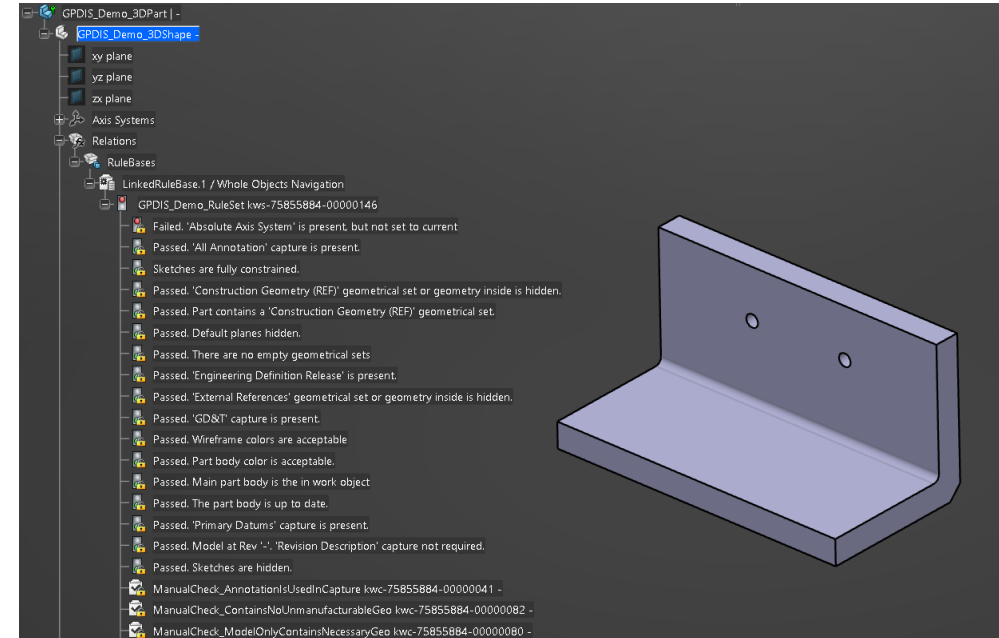


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- **Lets explore the tools**
 - **3DExperience Apps**
 - Engineering Knowledge Language (EKL)
 - **Quality Rules Capture App**
 - Automated
 - Create the Check
 - Define the Check
 - Manual
 - Create the check
 - Define the check
 - **Quality Rules Reuse App**
 - Solve Automated Checks



Continue wasting time with manual entry and validation, or build the quality in.

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 - Create the Check
 - Define the Check
 - Manual
 - Create the check
 - Define the check
 - Quality Rules Reuse App
 - Solve Automated Checks
 - Solve Manual Checks

Continue wasting time with manual entry and validation, or build the quality in.

The screenshot displays a CAD software interface. On the left, a tree view shows the structure of a part named 'GPDIS_Demo_3DPart'. It includes elements like 'xy plane', 'yz plane', 'zx plane', 'Axis Systems', 'Relations', and 'RuleBases'. A 'RuleBases' folder is expanded to show a 'LinkedRuleBase.1' containing a 'GPDIS_Demo_RuleSet'. Below the tree, a list of rule results is visible, such as 'Failed. Absolute Axis System is present but not...', 'Passed. All Annotation capture is present.', 'Sketches are fully constrained.', etc.

On the right, a 'Reports' window shows a table with columns for 'Pe...nt' and 'Description'. The table lists various rules and their completion percentages. A context menu is open over one of the rows, showing options: 'Valid' (with a green checkmark), 'Not valid' (with a red X), and 'To Be Reviewed' (with a yellow question mark).

Pe...nt	Description
91%	LinkedRuleBase.1 (2 - Fatal)
91%	GPDIS_Demo_Ru... (2 - Fatal)
0%	Failed. 'Absol... (2 - Fatal)
100%	Passed. 'All A...re is present
100%	Sketches are... constrained.
100%	Passed. 'Con...e is hidden.
100%	Passed. Part ...metrical set.
100%	Passed. Defa...anes hidden.
100%	Passed. Ther...metrical sets
100%	Passed. 'Engi...e' is present.
100%	Passed. 'Ext...de is hidden.
100%	Passed. 'GD&...e is present
100%	Passed. Wire...e acceptable
100%	Passed. Part...s acceptable.
100%	Passed. Main... work object
100%	Passed. The ...s up to date.
100%	Passed. 'Pri...e is present.
100%	Passed. Mode...ot required
100%	Passed. Sket... are hidden.
0%	ManualChec...-00000041
0%	ManualChec...-0
0%	ManualChec...-0
0%	ManualChec...-0
0%	ManualChec...-00000061
0%	ManualChec...-00000081
0%	ManualChec...-00000084

Any Questions
Please reach out anytime
Thank you



Jonathon Sutton

email: jonathon.j.Sutton@boeing.com

Phone: (425)-234-9918

- **Image Citations**

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- Checklist Image by [Tumisu](#) from [Pixabay](#)
- Scales Image by [Mona Tootoonchinia](#) from [Pixabay](#)
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