

# Vinnova FFI HP – MPQP

## Model driven Process and Quality Planning

Process FMEA


Control plan


KTH STEP Viewer -- Model based process and control plan

File View Settings

- Products
  - Boxy prototype
  - Boxy design
  - PW
  - Properties
  - Classes
- Process plans
  - Boxy 3-axis machining 7 setups
  - Description: MPQP Boxy process plan
  - Process name undefined
  - op 010
    - Description: Machining
    - Recipe: Face machining
    - Input
    - Output
    - Resources
      - Workshop 1
      - Workshop 2
      - Workshop 3
    - op 020
    - op 030
    - op 035
    - op 040
    - op 050
    - op 060
    - op 070
  - PFMEA
  - Control plan

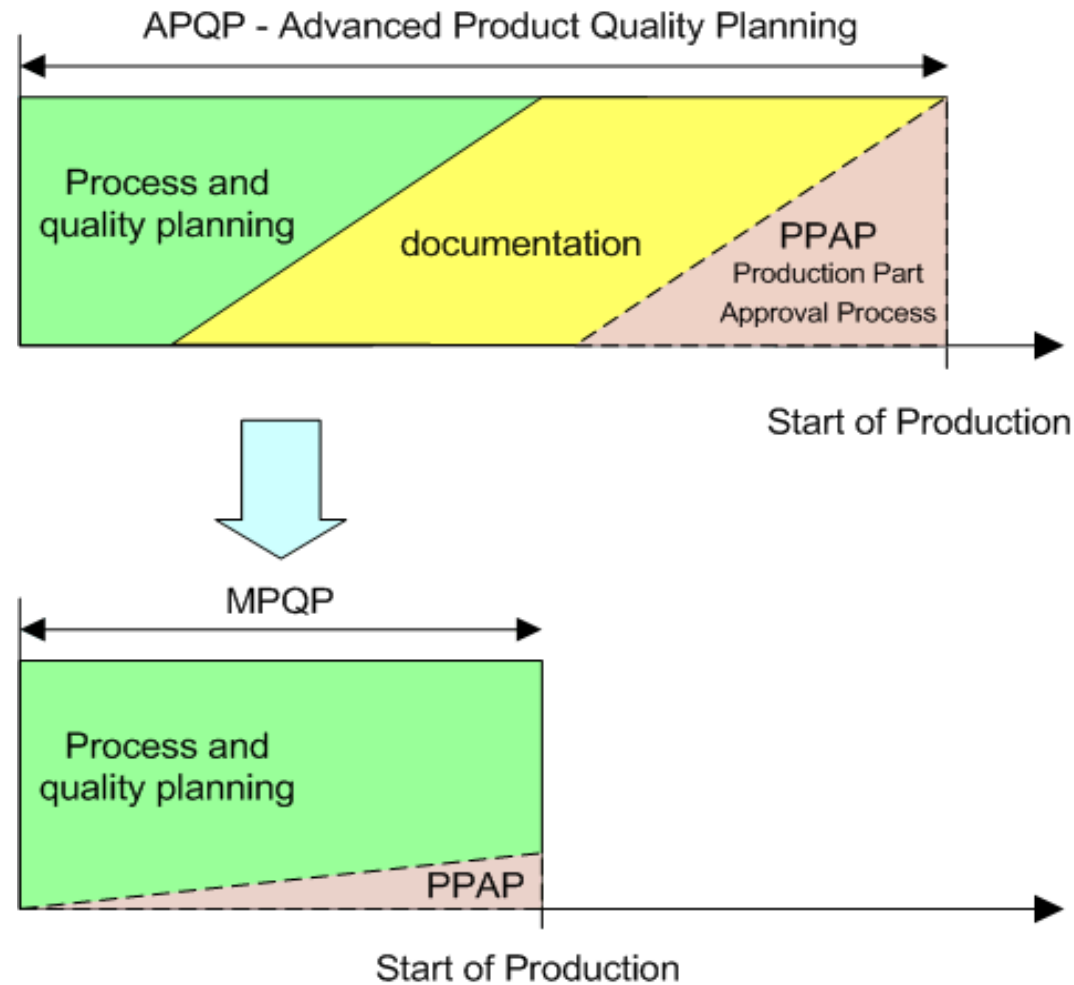
Setuo 1.





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# MPQP – Objective



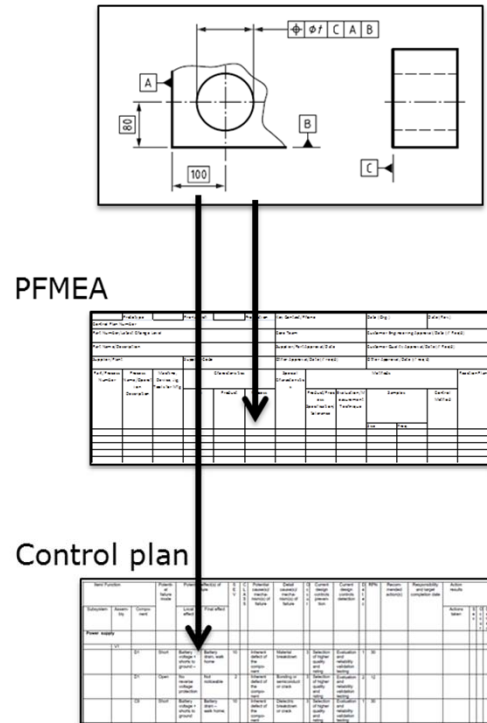
MPQP - Model driven Process and Quality Planning (2014 – 2017)



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# PPAP – Production Part Approval Process

Describe many times  
in many ways  
in many places...



<b>Significant production run</b>
1-8 hour
300 consecutive parts (minimum)
<b>PPAP documents</b>
1. Design Record
2. Engineering Change documents
3. Customer Engineering Approval
4. Design FMEA
5. Process Flow Diagram
6. Process FMEA
7. Control Plan
8. Measurement System Analysis Studies
9. Dimensional Results
10. Material, Performance Test Results
11. Initial Process Studies
12. Qualified Laboratory Documentation
13. Appearance Approval Report
14. Sample Product
15. Master Sample
16. Checking Aids
17. Records of Compliance With Customer-Specific Requirements
18. Part Submission Warrant



MPQP - Model driven Process and Quality Planning (2014 – 2017)



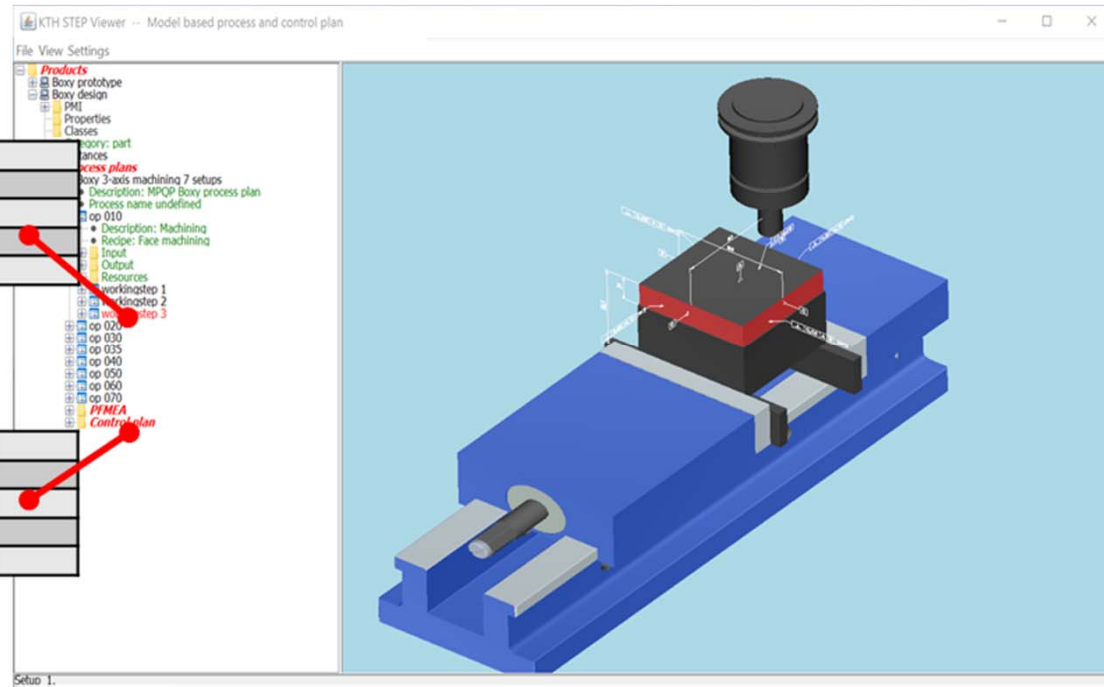
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# Model based PPAP

Describe once  
in one way  
in one place

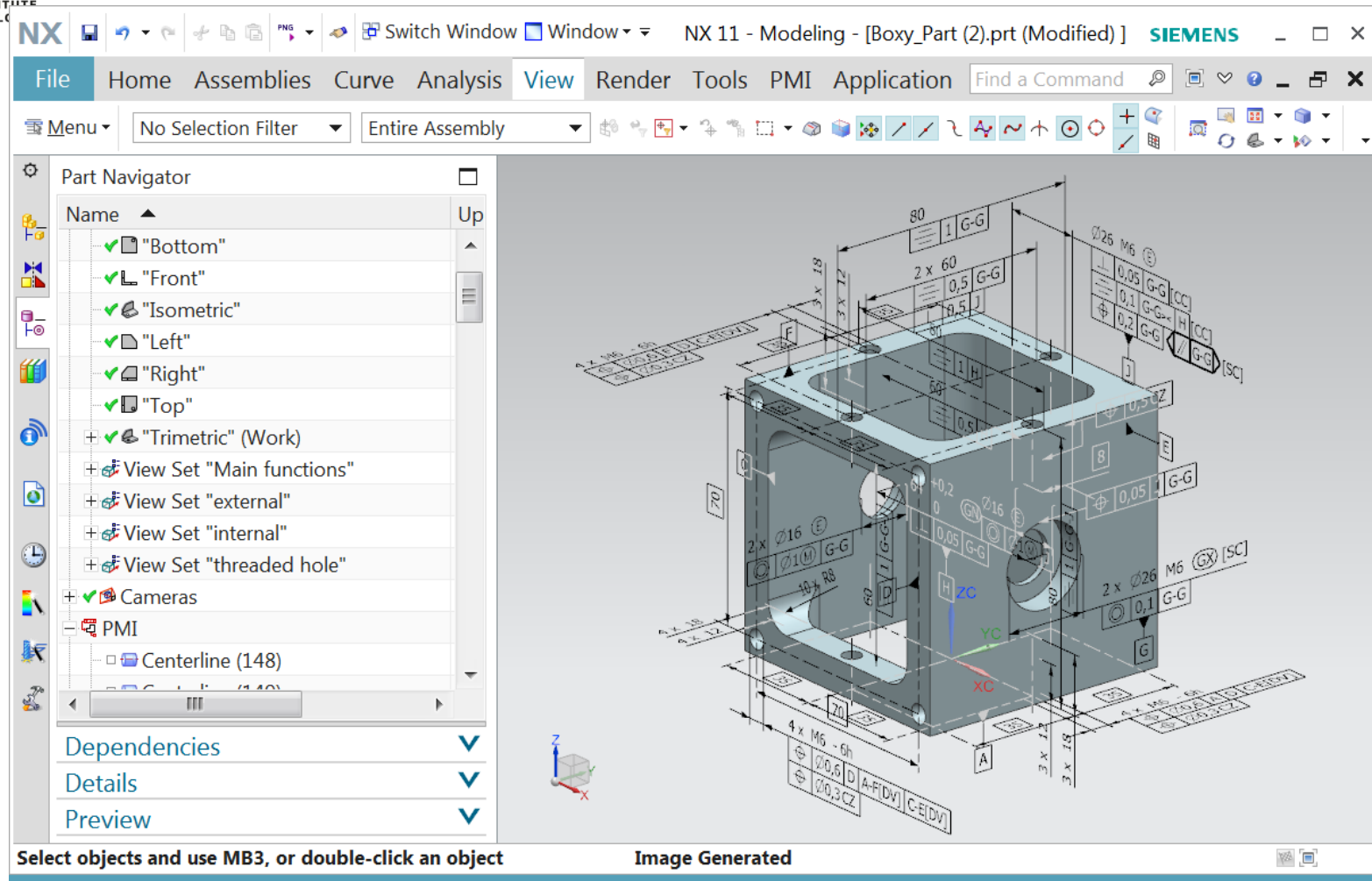
Process FMEA


Control plan

MPQP - Model driven Process and Quality Planning (2014 – 2017)

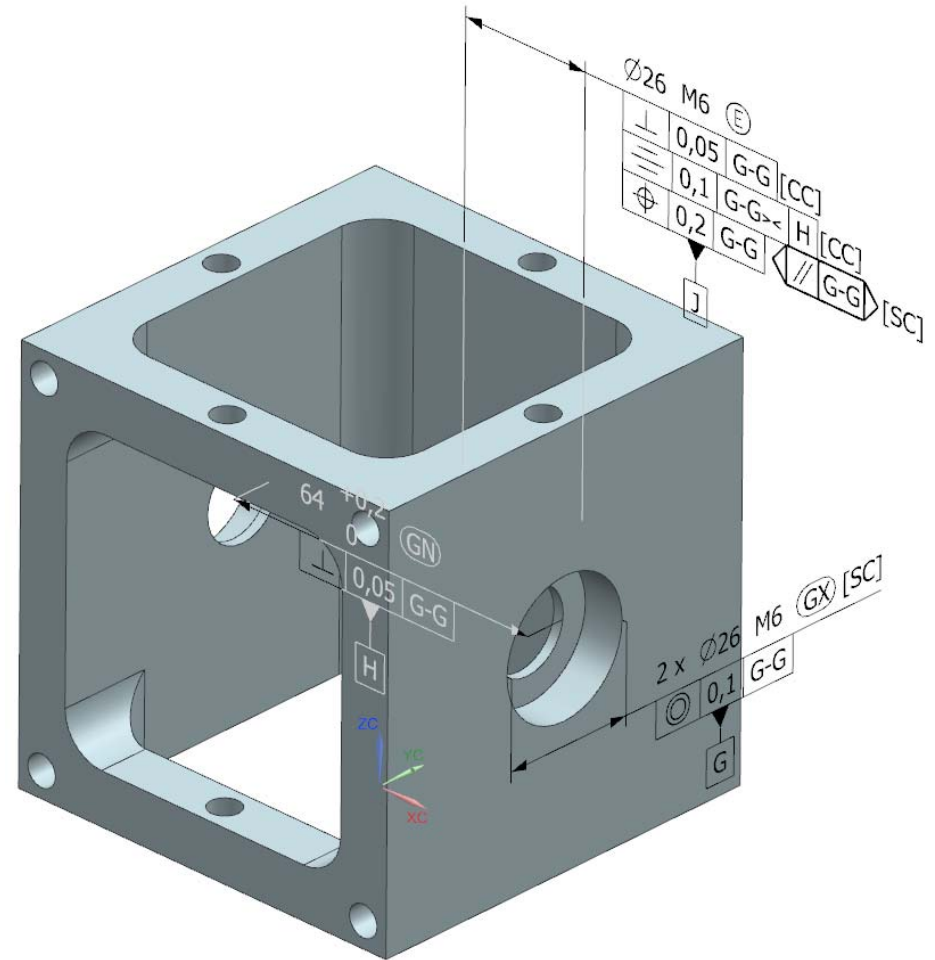
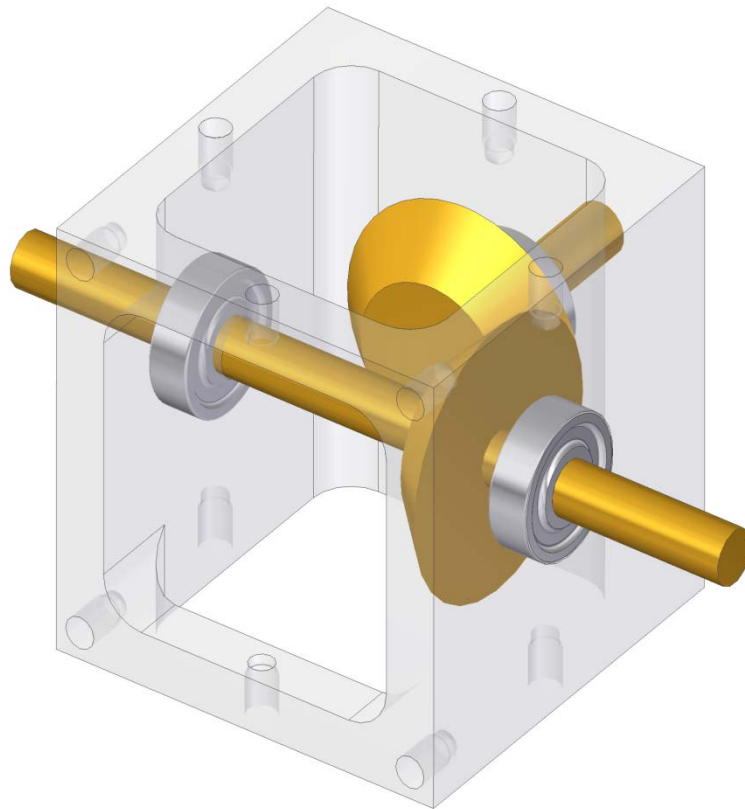
# Product in MPQP demonstrator





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# Product in MPQP demonstrator



**FFI** Strategic Vehicle Research and Innovation

WINNOVA Swedish Energy Agency TRAFIKVERKET

SCANIA VOLVO

## MPQP - Model driven Process and Quality Planning (2014 – 2017)

# Model driven Process and Quality Planning

Describe once  
in one way  
in one place  
in many views



workingstep 5

workingstep 6

- Description: Machining
- Recipe: Tapping M6
- PFMEA**
- Failure mode: broken tap (RPN=15.0)
  - RPN: 15.0
  - Failure cause: insufficient lubrication
  - Failure effect: impossible to assemble lid
  - Occurrence: 3.0
  - Severity: 5.0
  - Detectability: 1.0
- Failure mode: broken tap (RPN=5.0)

workingstep 7

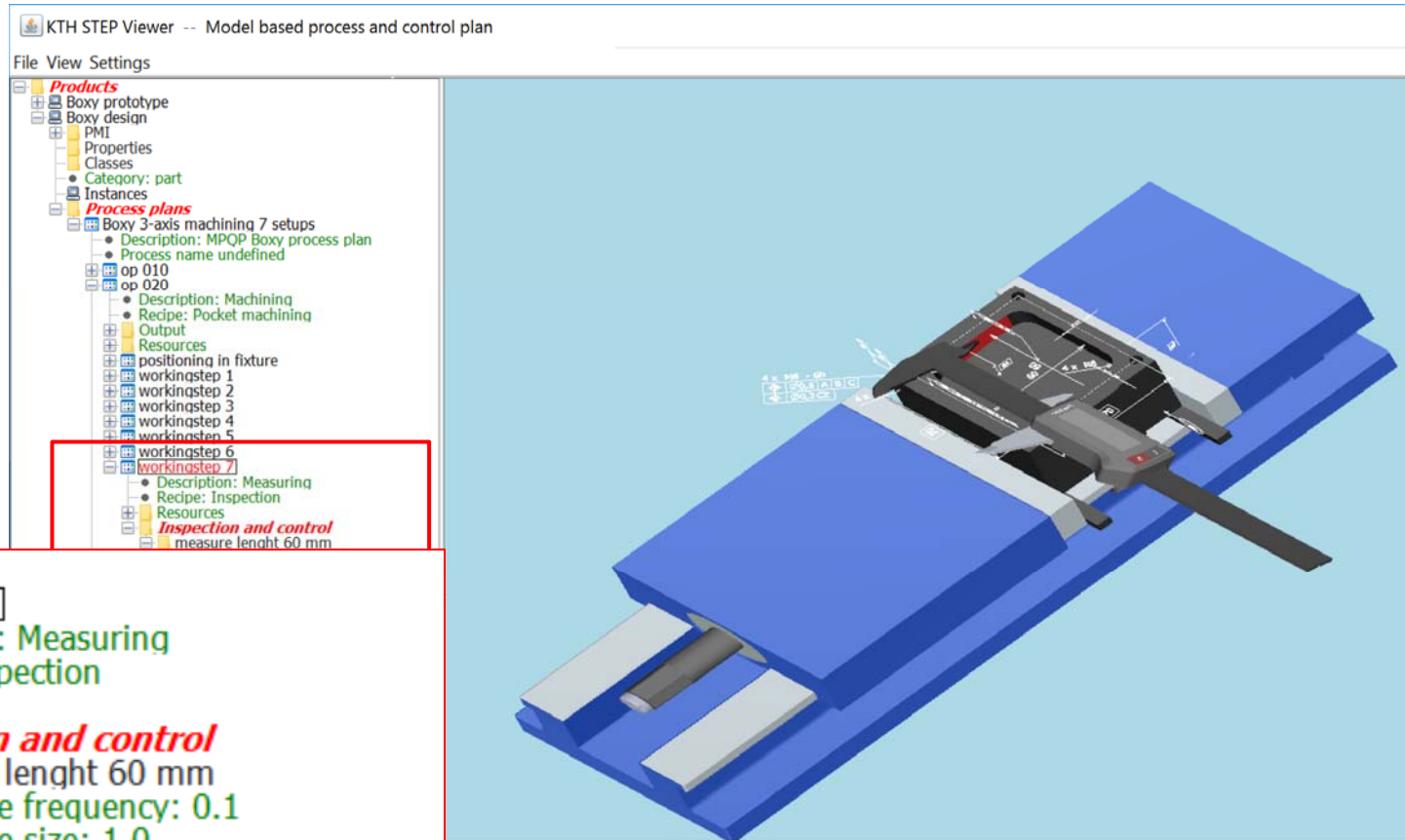
op 030



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# Model driven Process and Quality Planning

Describe once  
in one way  
in one place  
in many views



workingstep 6

workingstep 7

- Description: Measuring
- Recipe: Inspection
- Resources
- Inspection and control
- measure lenght 60 mm
  - sample frequency: 0.1
  - sample size: 1.0
  - control method: statistical process control
  - Specification id: 2345

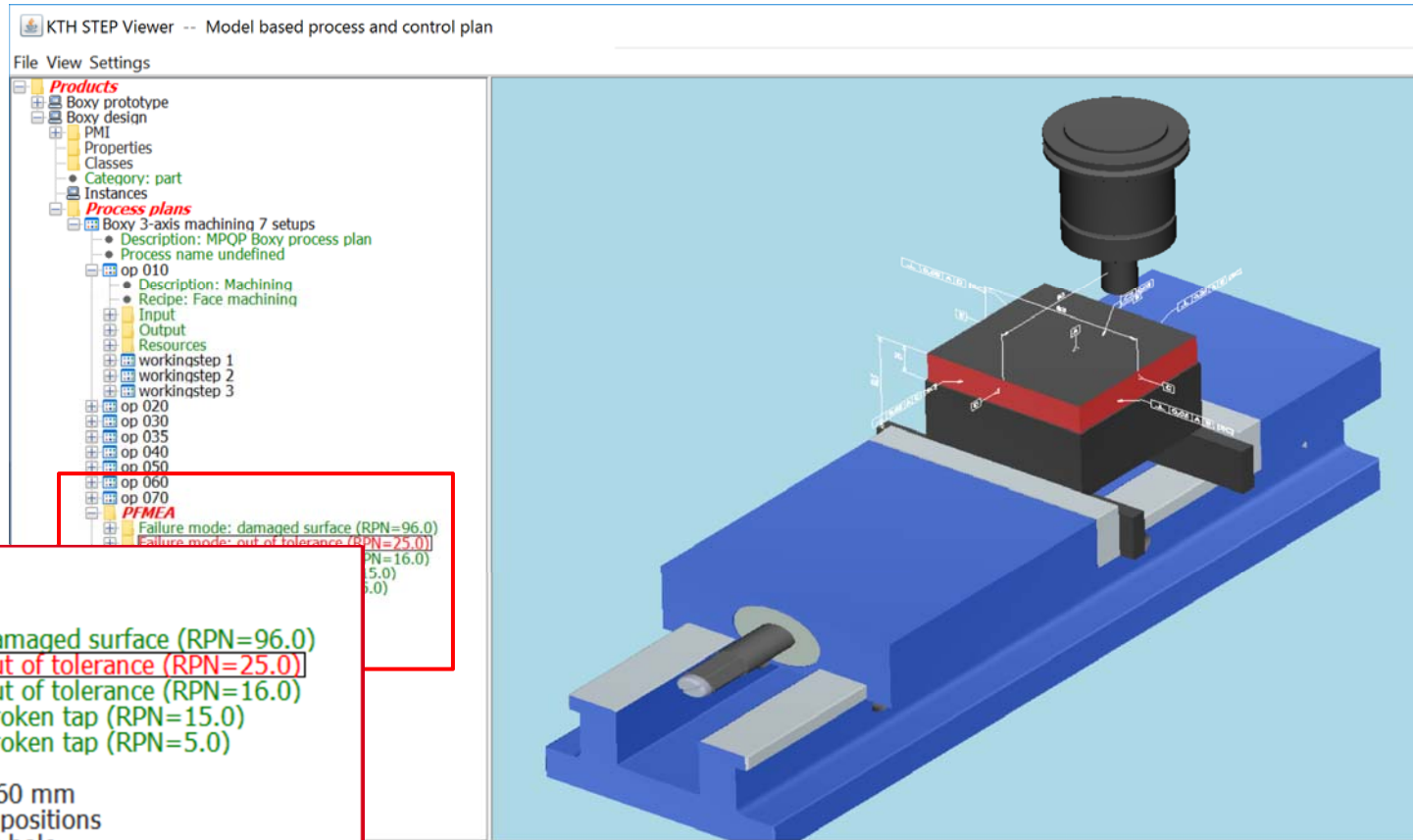


MPQP - Model driven Process and Quality Planning (2014 – 2017)



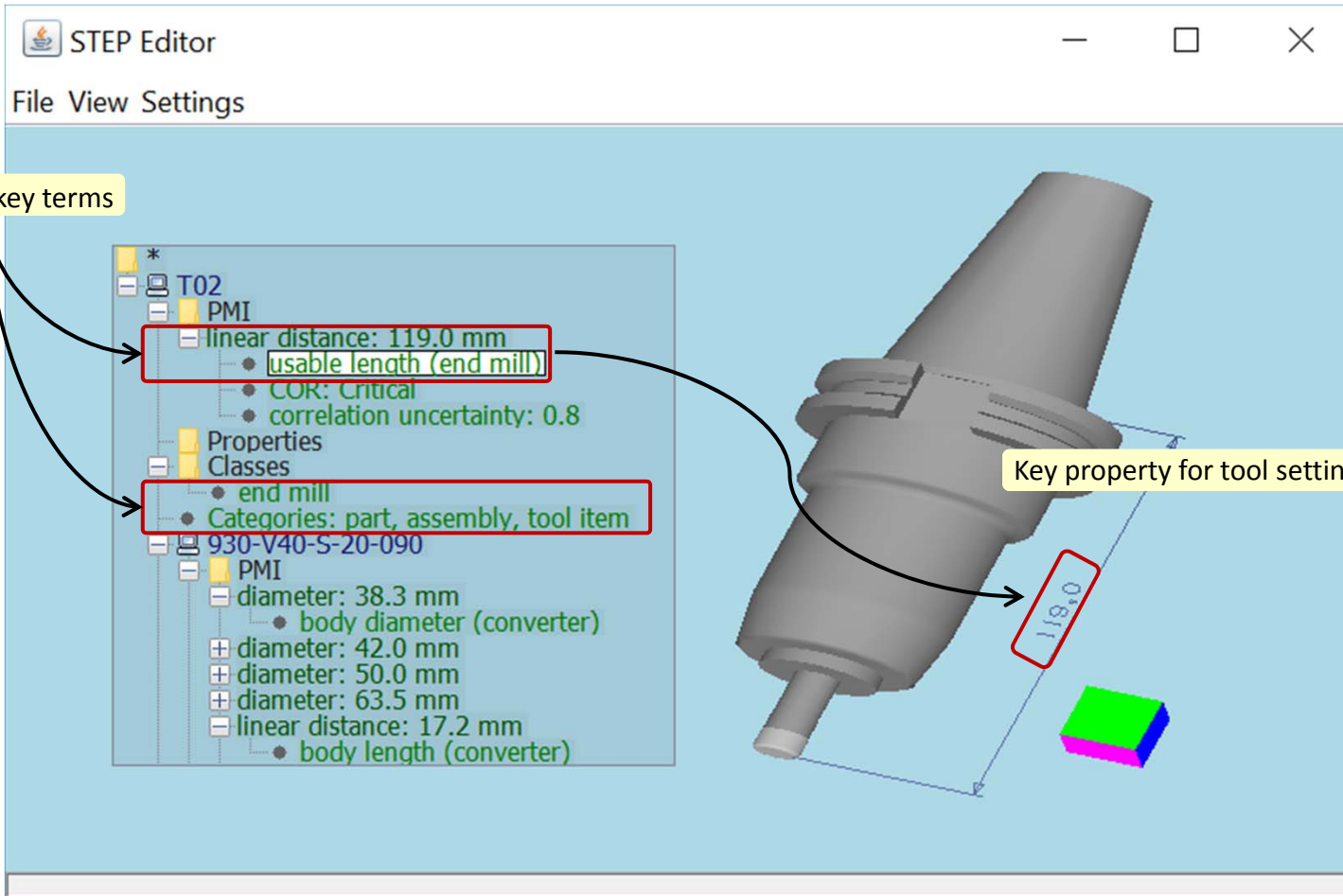
# Model driven Process and Quality Planning

Describe once  
in one way  
in one place  
in many views



- op 060
- op 070
- PFMEA**
- Failure mode: damaged surface (RPN=96.0)
- Failure mode: out of tolerance (RPN=25.0)
- Failure mode: out of tolerance (RPN=16.0)
- Failure mode: broken tap (RPN=15.0)
- Failure mode: broken tap (RPN=5.0)
- Control plan**
- measure length 60 mm
- measure plane's positions
- measure bearing hole

# MPQP – Cutting tool information



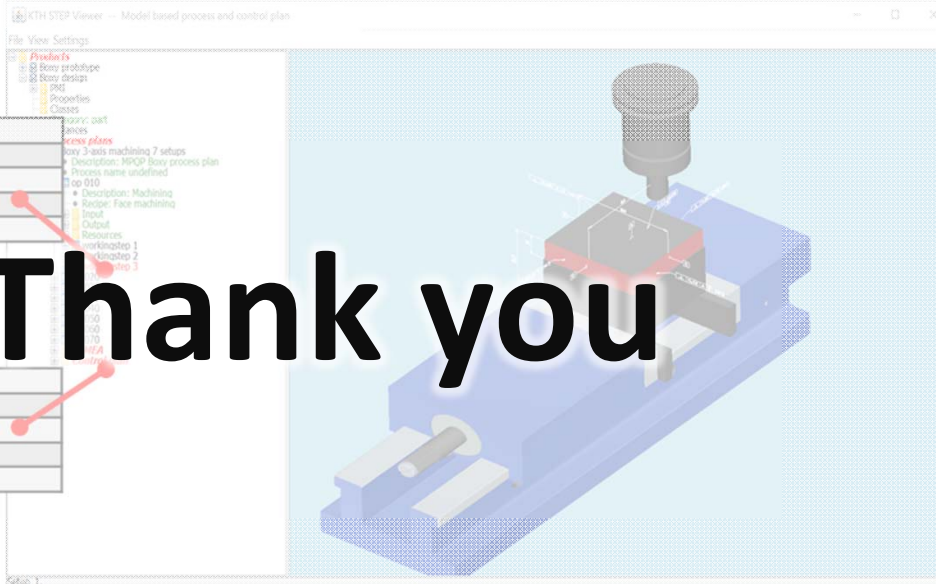
# Vinnova FFI HP – MPQP

## Model driven Process and Quality Planning

Process FMEA


Control plan


**Thank you**



The screenshot shows the KTH STEP Viewer interface. On the left, there is a tree view with categories like 'Process plans', 'Machining', and 'Face machining'. In the center, there is a 3D CAD model of a blue milled part with a grey tool bit positioned above it. On the right, there are two grid-based tables labeled 'Process FMEA' and 'Control plan', both containing red cells. A large 'Thank you' text is overlaid on the center of the image.

