Feature Based NC Programming in CATIA V5 CAM Modules

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Feature Based NC Programming in CATIA V5 CAM Modules

- **Milling Process**
  - Write-Out Module
  - STEP-NC Code Generation
  - Feed-Back Module

- **Non Milling Process**
  - Write-Out Module
  - STEP-NC Code Generation

- **Conclusion and Future**
Global Milling Process for Prototype Validation

1. Feature Based Design
2. Feature Based NC Programming
3. STEP-NC and NC Code Generation
4. STEP-NC Based NC Manufacturing
5. STEP-NC Based Shop Floor Modifications
STEP-NC CATIA V5 MILLING Process

- Write-out module V5R8 GA / V5R9 SP4
  - ISO-14649 format
  - Work plan and Set-Up definition
  - Milling and drilling tools definition
  - 2.5 milling and drilling operations
  - Tool Path definition (optional)
  - Tests and validation
    - Validation Tests on CNC Machine for simple parts
    - WZL Institute (Germany)
    - DaimlerChrysler (Germany)
    - VOLVO (Sweden)
    - BOEING (US)

- Read-in module V5R8 GA / V5R9 SP4
  - Feedbacks of modified STEP-NC files
  - Process is updated to take into account modifications
  - Tests and validation
    - WZL Institute (Germany)
    - DaimlerChrysler (Germany)
    - VOLVO (Sweden)
Part to Machine
Feature Based Design
Face 1 and Face 2 Machining
Feature Based NC Programming
STEP-NC Code Generation

- Select a Machining Program and Generate the STEP-NC code
  - Dedicated Output Option for STEP-NC Prototype
Feed-Back of CATIA STEP-NC modified files

- Modification of existing STEP-NC file with SIEMENS Editor
  - STEP-NC file generated is edited with dedicated editor running at the controller level
  - Modification of Feeds and Speeds, …, Cutting Depth, …)
CATIA STEP-NC Read-In Module

- Dedicated command to Import Generated STEP-NC code
  - Update of CATIA Import Command to be able to read STEP-NC files
  - Possibility to read STEP-NC files from the file system
CATIA V5 Result

- Processing of Step-NC data from the selected file
  - All work pieces are processed,
  - All tools and operations are modified in CATIA V5 according to STEP-NC files modifications
  - Information panel is displayed at the end of processing
  - Operations mask identifies that operation has changed
  - Simulation of operations shows the differences (ex: cutting depth)

Before Processing                                After Processing
Global Non Milling Process for Prototype Validation

1. Feature Based Design
2. Feature Based NC Programming
3. STEP-NC and NC Code Generation
4. STEP-NC Based NC Manufacturing
STEP-NC CATIA V5 Non MILLING Process

- **Write-out prototype module V5R9 SP4**
  - ISO-14649 format
  - Work plan and Set-Up definition
  - Turning tools definition
  - Turning operations
  - Tool path definition (optional)

- **Tests and validation**
  - Validation Tests on CNC Machine for simple parts
  - ISW
  - Boehringer
Part to Machine and Machining Process
STEP-NC Code Generation

- Select a Machining Program and Generate the STEP-NC code
  - Dedicated Output Option for STEP-NC Prototype
  - Today status (only tools definition)
Conclusion and Future

- Today Prototype based on CATIA V5R9 SP4
- Milling Process (closed)
- Non Milling Process (running)
- Future: WP6, Implementation Non-Milling
  - Prototype module for Turning (On going)
  - Prototype module for Contour Cutting
    - NURBS implementation
      (? , Under definition, not confirmed)
  - Prototype module for 2.5 Axis including Dimensional Tolerances
    (? , Under definition, not confirmed)
Thank you

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