

# What's New in NX 6 CAM

## *Usability*

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May 2008

- NX Usability Enhancements
  - Visual Design Acceleration
  - Shortcuts in Option Lists
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- Operation Navigator
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  - Other enhancements
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  - Cut Pattern block
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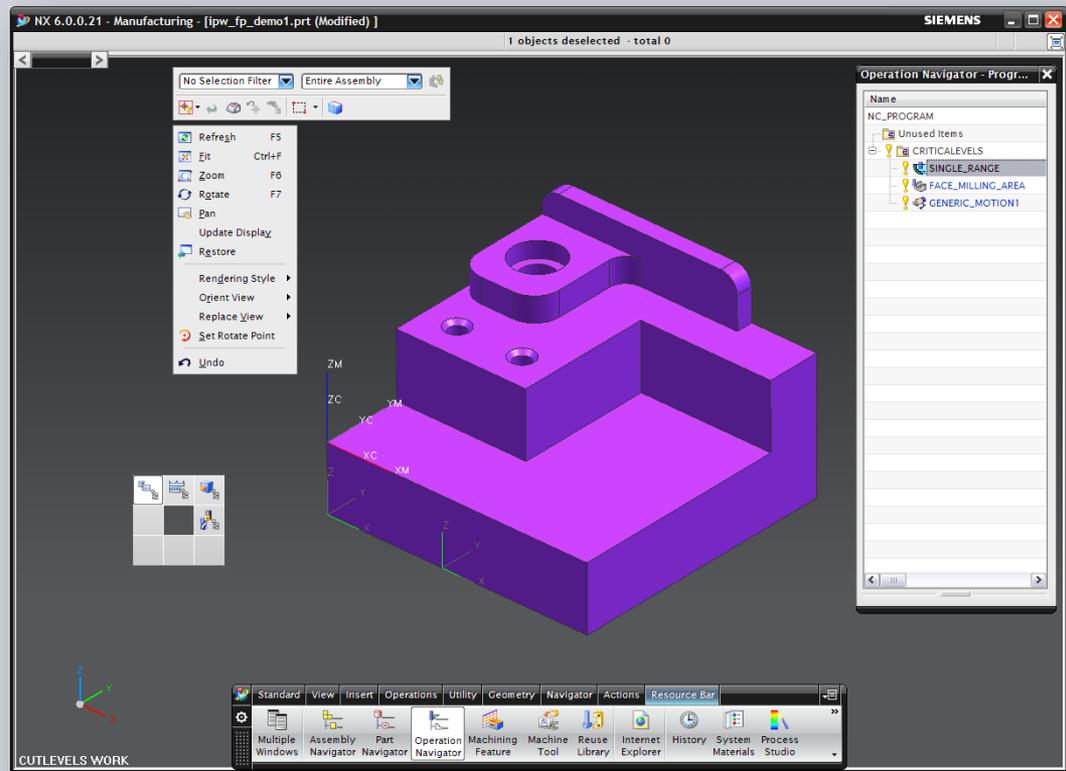
- Tools
  - Tool Description
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  - Welcome Screen
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# NX Usability Enhancements

## *Visual Design Acceleration*

SIEMENS

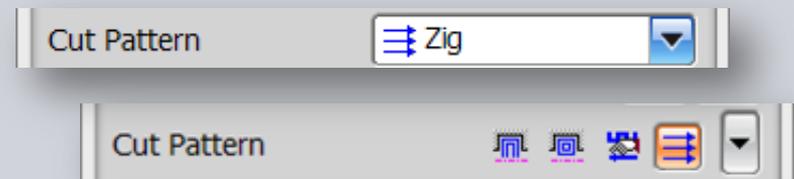
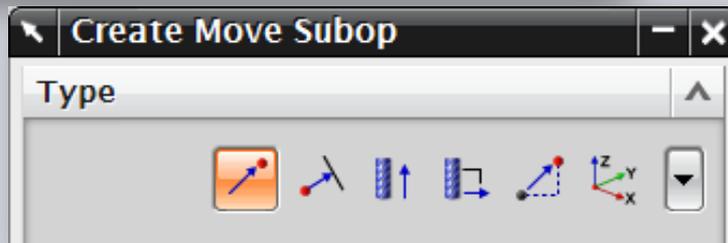
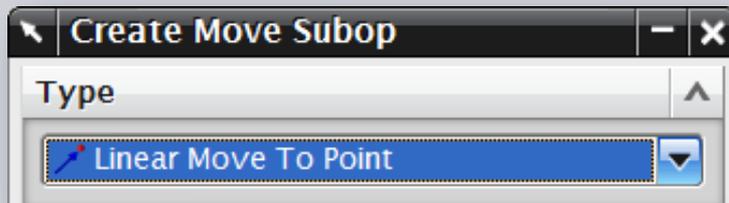
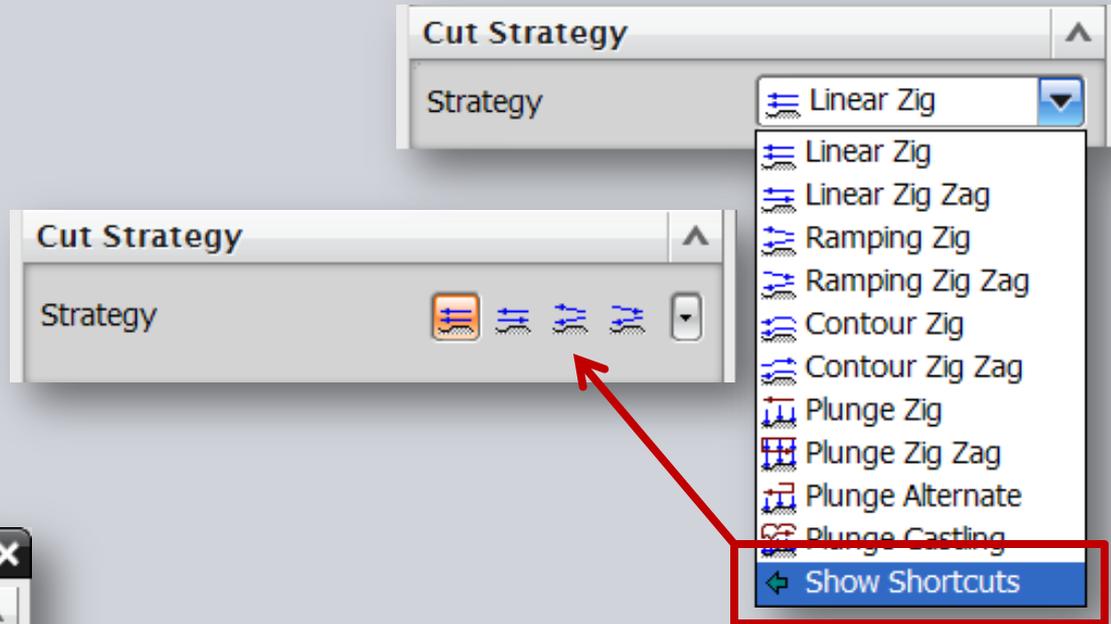
- Full Screen Mode
  - Toolbar Manager
- Mini Selection Bar
- Customizable Radial Toolbar
  - Change views
  - Create objects
  - Geometry toolbar
- New color table
  - Colors close to NX 5
  - CAM Setup Assemblies use darker background
- Movie Toolbar



# NX Usability Enhancements

## Shortcuts in Option Lists

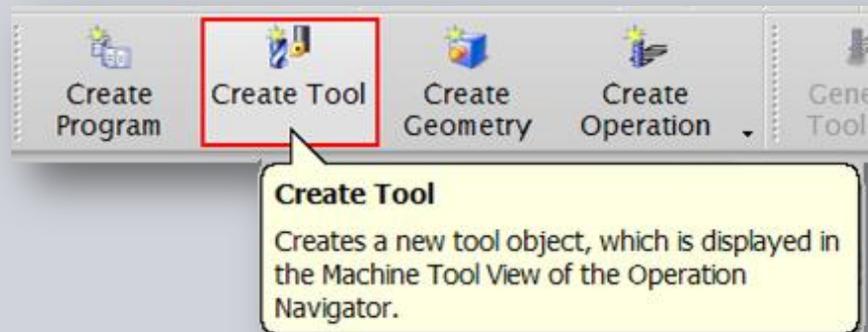
- Change display of Types and Options
- Most recent selections are easily available with one pick



# Command Finder

## CAM Content

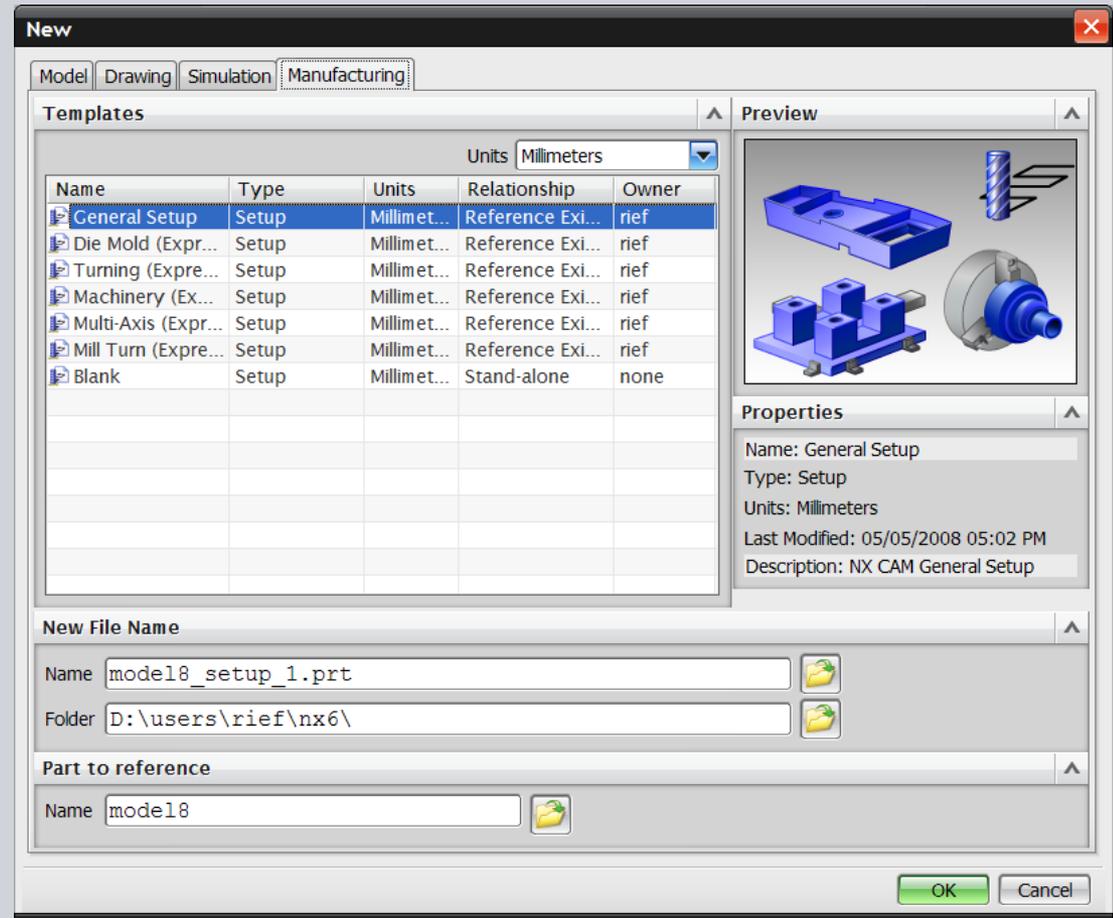
- CAM Menu entries
- CAM Template subtypes
  - Descriptions of all Operations, Tools, Geometry groups, Methods, Programs



## File → New

### Manufacturing Templates

- Recommended way to create a setup
- Creates assembly
- Same functionality as Setup Library and Express Palette
- Consistent with Drafting
- Enforces Master Model
- Customer default for naming convention



# Operation Navigator

## *Copy and Paste Operations Between Parts*



- Voted #1 ER last year
- Copy Operations only
- Paste only in geometry view
- Determining the four parents
  - Geometry
    - From the paste selection
  - Program, Tool, Method
    - Same as template load with parent
    - If a matching parent found, it is used
    - If not found, it is created

# Operation Navigator

## User Defined Event Display

- Columns for Start and End Events
- Events displayed in tool tip

| Name                   | Path | Start Events  | End Events  | Tool        | Tool Number |
|------------------------|------|---|---|-------------|-------------|
| NC_PROGRAM             |      |   |   |             |             |
| Unused Items           |      |   |   |             |             |
| PROGRAM1               |      |   |   |             |             |
| ZLEVEL_PROCESS         |      |   |   |             |             |
| ZL_PRE_ROUGH_ZL        | ✓    |   |   | UGT0202_001 | 1           |
| ZL_ROUGH_ZLEVEL_STEEP  | 🔒    |  |   | UGT0203_009 | 8           |
| ZL_ROUGH_FLOWCUT       | 🔑    |   |  | UGT0203_009 | 8           |
| ZL_SFIN_FLOWCUT        | 🔒    |   |   | UGT0203_010 | 9           |
| ZL_ROUGH_NON_STEEP_135 | ✓    |   |   | UGT0203_009 | 8           |
| ZL_SFIN_ZLEVEL_STEEP   | ✓    |   |   | UGT0203_009 | 8           |
| ZL_SFIN_NON_STEEP_45   | ✓    |   |   | UGT0203_009 | 8           |
| ZL_FIN_ZLEVEL_STEEP    | ✓    |   |   | UGT0203_011 | 10          |
| ZL_FIN_FLOWCUT         | ✓    |   |   | UGT0203_011 | 10          |

Operator Message/Operator  
Message=Start  
Optional Stop/Status=Active  
Coolant  
On/Status=Active,Type=Flood

# Operation Navigator

## *Display Selection*

- Objects highlight in graphics screen when they are selected in the Navigator
  - Tool path and geometry for operations
  - IPW for turning operations
  - Solid tool preview for tools
  - Selected geometry for geometry groups
- Consistent with Part and Assembly Navigators
- Quick way to browse through a part
- Displaying of multiple selected objects is supported for operations
  - For mixed selections of objects the display will be cleared
  - Turning IPW only for single selection
- Display of objects and turning IPW can be turned off in Preferences or Customer Defaults

# Operation Navigator

## New Operation Status – “Approved”

- Approved
- Can be used to override repost or regenerate status
- Model updates cause operations to change to regenerate status
- Use this if you know the update does not affect the path
- No warnings during output
- MB3 → Object → Approve

| Name                     | Path | Start Events | End Events |
|--------------------------|------|--------------|------------|
| NC_PROGRAM               |      |              |            |
| Unused Items             |      |              |            |
| ✓ PROGRAM1               |      |              |            |
| ⊖ ZLEVEL_PROCESS         |      |              |            |
| ! ZL_PRE_ROUGH_ZL        | ✓    |              |            |
| ! ZL_ROUGH_ZLEVEL_STEEP  | 🔒    | 📄            |            |
| ⊖ ZL_ROUGH_FLOWCUT       | 🔑    |              | 📄          |
| ⊖ ZL_SFIN_FLOWCUT        | 🔒    |              |            |
| 👉 ZL_ROUGH_NON_STEEP_135 | ✓    |              |            |
| ! ZL_SFIN_ZLEVEL_STEEP   | ✓    |              |            |

# Operation Navigator

## New Path Status – “Locked”

- Locked 
  - Protects a path from being overwritten by accidental regeneration
    - Examples: edited path, flowcut manual cut order, etc.
  - Customer default to automatically lock tool path of parts from previous releases upon loading
    - All operations with a status of repost or complete will automatically have their tool path locked
    - Use this to protect tool path of old parts from accidental regeneration
- Tool tip shows information how, when and by whom the tool path was locked

| Name  | Path | Start Events | End |
|---|------|--------------|-----|
| NC_PROGRAM  |      |              |     |
| Unused Items  |      |              |     |
| CRITICALEVELS   |      |              |     |
|  SINGLE_RANGE      |      |              |     |
|  FACE_MILLING_AREA |      |              |     |
|  GENERIC_MOTION1   |      |              |     |

Locked by wilmsen in NX 6 on 3-Apr-2008 16:58:40

| Name  | Path | Start Events | End Events |
|---|------|--------------|------------|
| NC_PROGRAM  |      |              |            |
| Unused Items  |      |              |            |
| CRITICALEVELS   |      |              |            |
|  SINGLE_RANGE      |      |              |            |
|  FACE_MILLING_AREA |      |              |            |
|  GENERIC_MOTION1   |      |              |            |

Locked by wilmsen automatically when opened in NX 6 on 03-Apr-2008 16:52:10

# Operation Navigator

## New Path Status – “Empty”

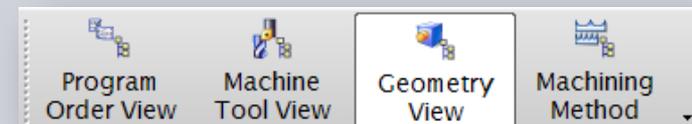
- Empty
- Path was generated successfully, but has no motion
- Not for Machine Control
- Examples:
  - Flowcut with no valleys
  - Rest milling with no IPW

| Name                       | Path                                | Tool                     | Time     |
|----------------------------|-------------------------------------|--------------------------|----------|
| PANEL_FORMING_FACE         |                                     |                          | 00:21:33 |
| PRE_RGH_STEEP_PANEL-S      | <input checked="" type="checkbox"/> | RBALLC_D30_G207_L100_F42 | 00:01:13 |
| PRE_RGH_STEEP_PANEL-L      | <input type="checkbox"/>            | RBALLC_D30_G295_L189_F42 |          |
| PRE_RGH_STEEP_PANEL-2-S    | <input checked="" type="checkbox"/> | RBALLC_D30_G207_L100_F42 | 00:01:19 |
| PRE_RGH_STEEP_PANEL-2-L    | <input type="checkbox"/>            | RBALLC_D30_G295_L189_F42 |          |
| RGH_STEEP_PANEL-S          | <input checked="" type="checkbox"/> | RBALLC_D30_G207_L100_F42 | 00:01:14 |
| RGH_STEEP_PANEL-L          | <input type="checkbox"/>            | RBALLC_D30_G295_L189_F42 |          |
| SEMI_FLOW_30_PANEL_PASS1-S |                                     | RBALLC_D30_G207_L100_F42 | 00:00:21 |
| SEMI_FLOW_30_PANEL_PASS1-L | <input type="checkbox"/>            | RBALLC_D30_G295_L189_F42 |          |
| SEMI_FLOW_30_PANEL_PASS2-S |                                     | RBALLC_D30_G207_L100_F42 | 00:00:21 |
| SEMI_FLOW_30_PANEL_PASS2-L | <input type="checkbox"/>            | RBALLC_D30_G295_L189_F42 |          |

# Operation Navigator

## *Other Enhancements*

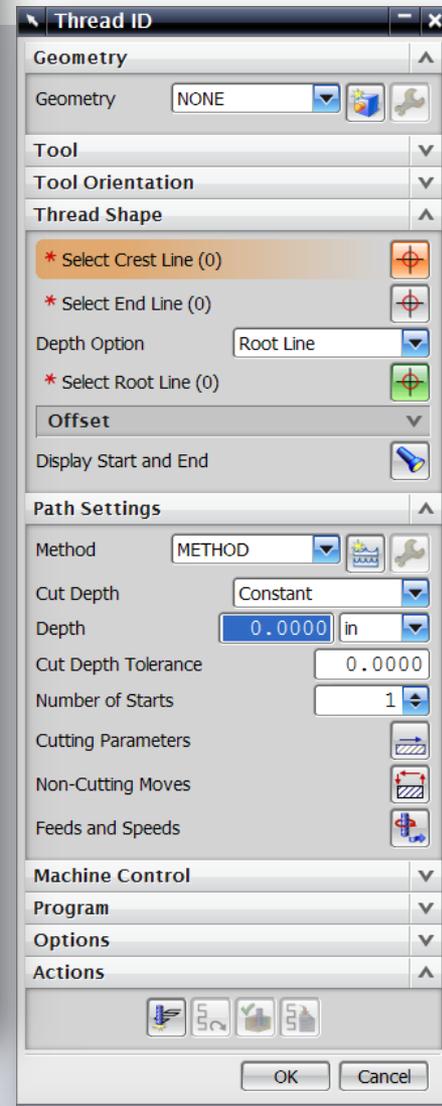
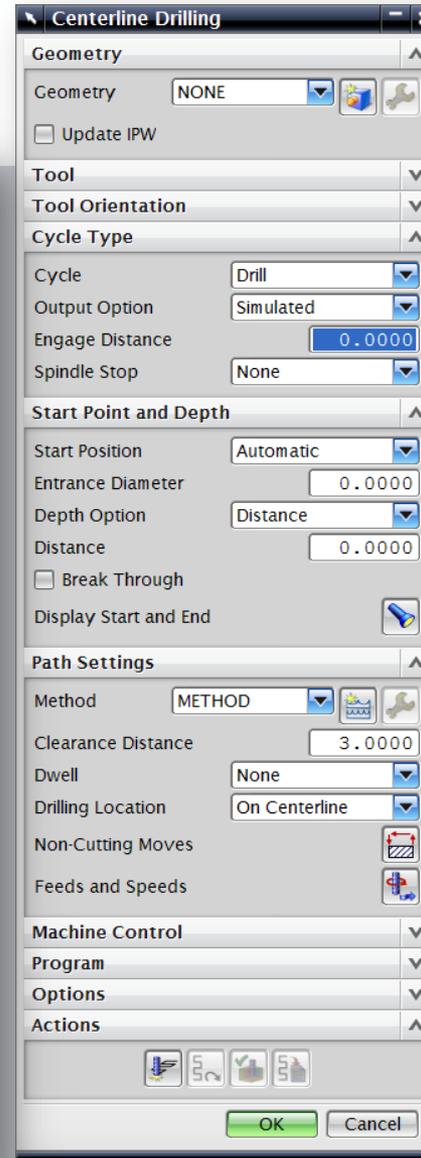
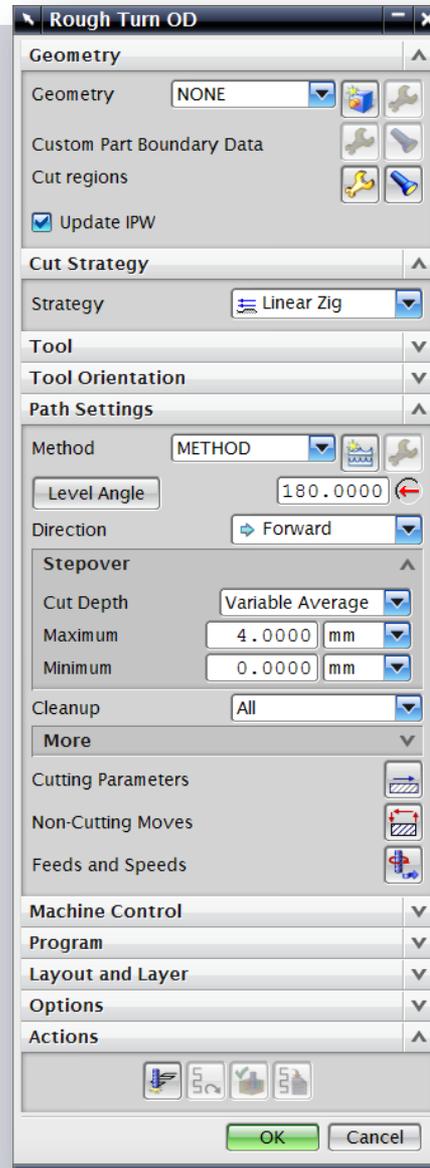
- Common Selection
  - Operations selected in any view are selected in all views
  - All views are expanded to show the operation
  - Turn on or off in customer defaults and preferences
- Color of Unused Objects
  - If an object is in the Unused (NONE) group in any view, it is a different color in all views
  - Specify the color in the operation navigator properties or customer defaults
  - Examples: the IPW does not look right
- Remove MB3 → Object → Inheritance List
  - Use the Details Panel instead
- Move Navigator View Toolbar to below Navigator



# Dialogs

## Turning Operations

- Consistent with Milling
- Common Groups
- Common Blocks
  - Parent Selection
  - Geometry
  - Stepmover

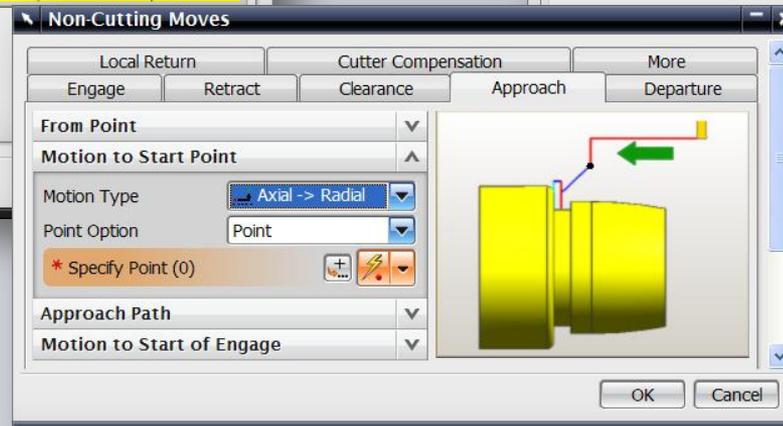
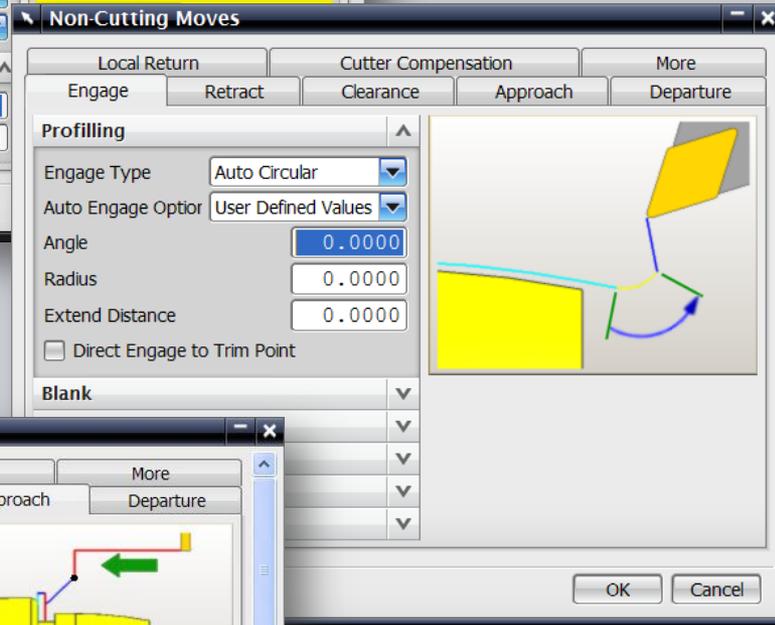
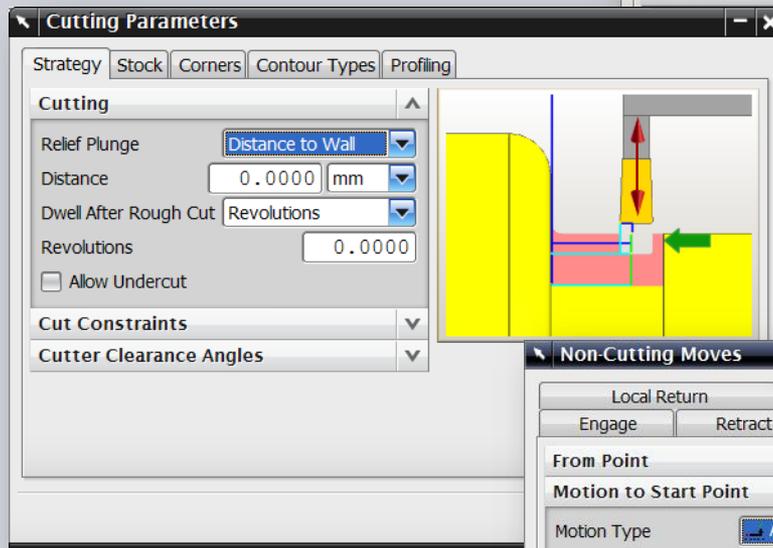
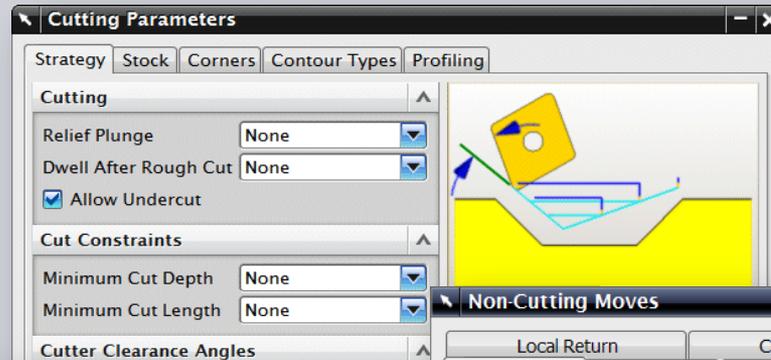


**SIEMENS**

# Dialogs

## Turning Cutting and Non Cutting

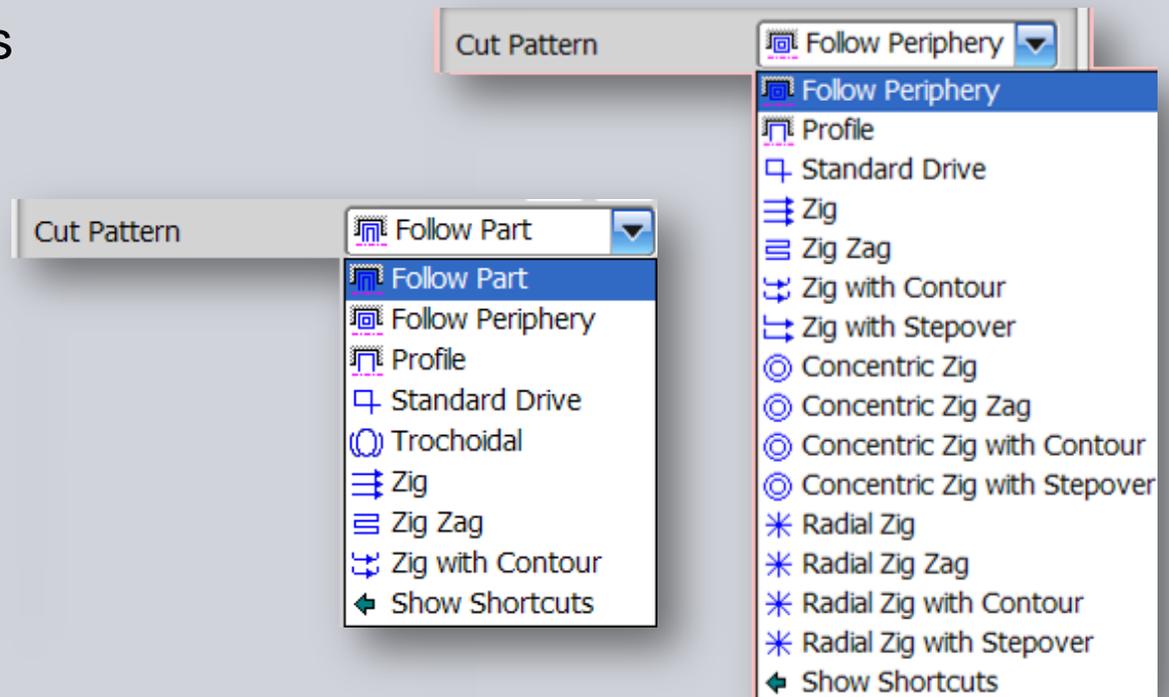
- Consistent with Milling
  - Group Layout
  - Terminology
  - 450+ Pictures



# Dialogs

## *New Cut Pattern Block*

- Same names and order in all Milling processors
- Single list in Surface Contouring



## Dialogs

### New Stepover Block

- Same names and order in all processors
- Use lists
- % Tool Flat** is the legacy stepover Tool Percentage
- %Tool Distance** is always the outside diameter

| Option               | Milling | Turning | WEDM |
|----------------------|---------|---------|------|
| None                 |         | X       |      |
| Constant             | X       | X       | X    |
| Scallop              | X       |         |      |
| % Tool Flat          | X       |         |      |
| Multiple             | X       | X       | X    |
| Number               | X       | X       |      |
| Maximum              | X       |         |      |
| Angular              | X       |         |      |
| Variable Average     | X       | X       |      |
| Variable Maximum     |         | X       |      |
| Use Depth of Cut     | X       |         |      |
| Percent of Remaining |         | X       |      |
| % Wire               |         |         | X    |
| Stock per Pass       |         |         | X    |

### Milling

Stepover: Multiple

Multiple

Number of Passes: 0

Distance: 0.0000 mm

| Passes | Distance |
|--------|----------|
| 0      | 0.000000 |
| 0      | 0.000000 |
| 0      | 0.000000 |

### Turning

Stepover: Multiple

Cut Depth: Multiple

Individual Cut Depths

Number of Passes: 0

Distance: 0.0000 mm

| Passes | Distance | Units |
|--------|----------|-------|
| 0      | 0.000000 | m     |
| 0      | 0.000000 | m     |
| 0      | 0.000000 | m     |

Stepover: % Tool Flat

Percent of Flat Diameter: 20.0000

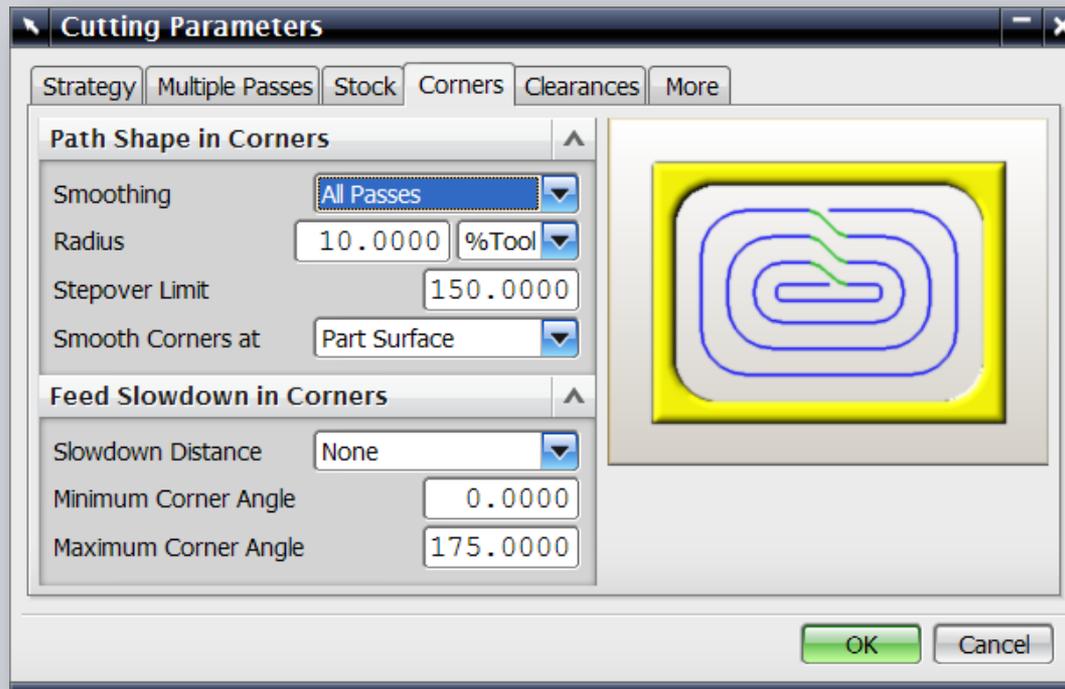
Stepover: Constant

Distance: 50.0000 %Tool

# Dialogs

## *Corner Control moved to Cutting Dialog*

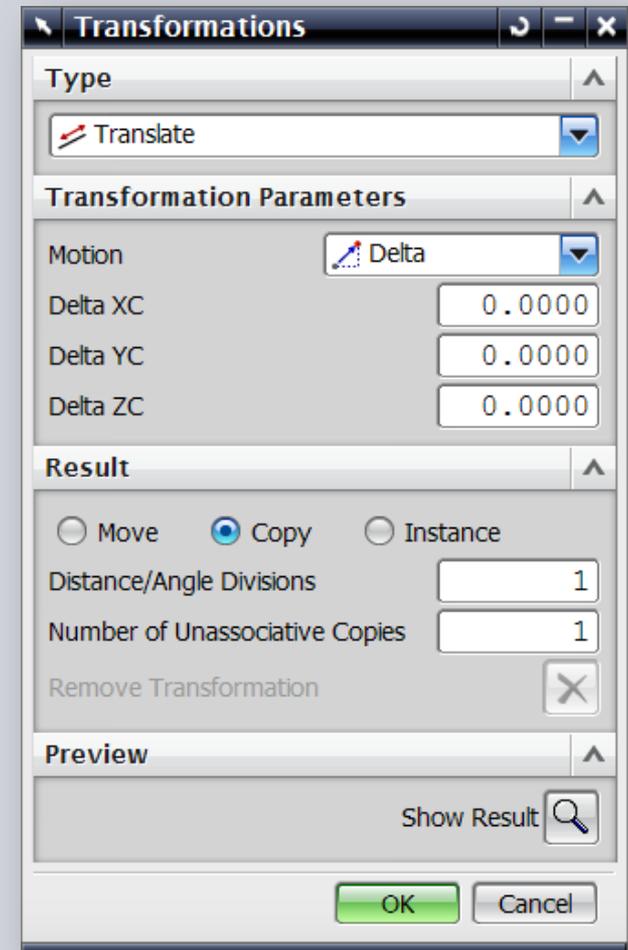
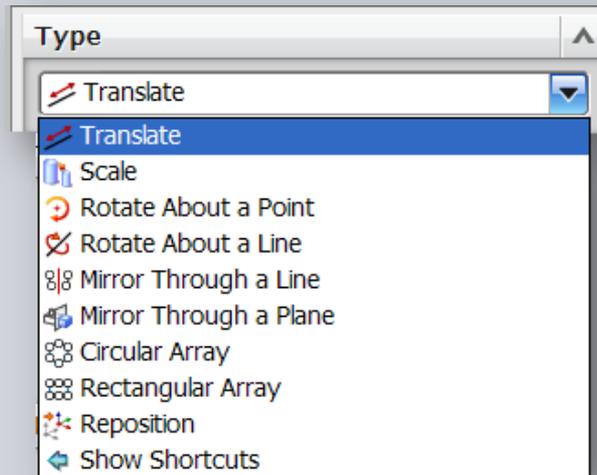
- Previously was on main dialogs and drive method dialogs
- New page in the Cutting dialog
- Includes new smoothing options, and removal of retired parameters
- Pictures for the popular options



# Dialogs

## Transform

- New Look – Block Based redesign
- New Interaction
  - No more Back
  - Remove confusion of how to stop
  - Clarify associativity

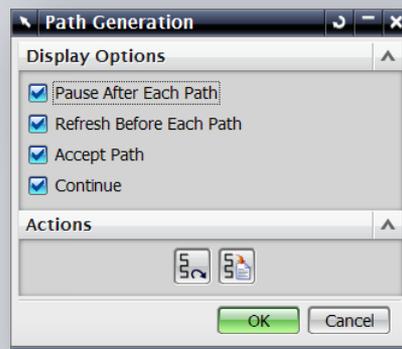
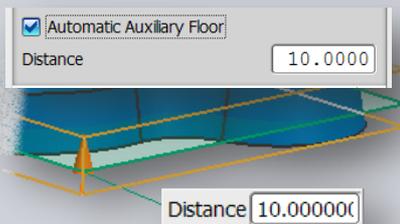
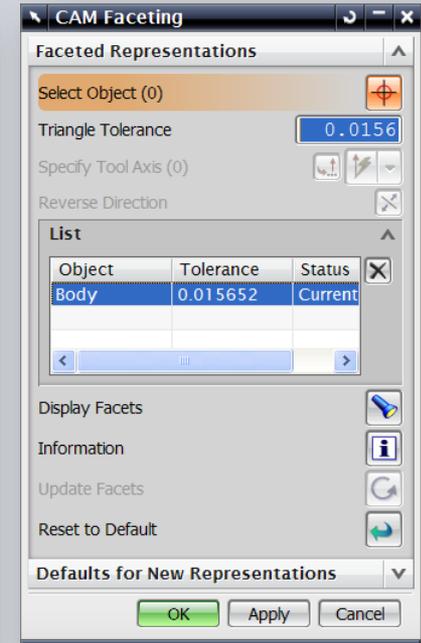
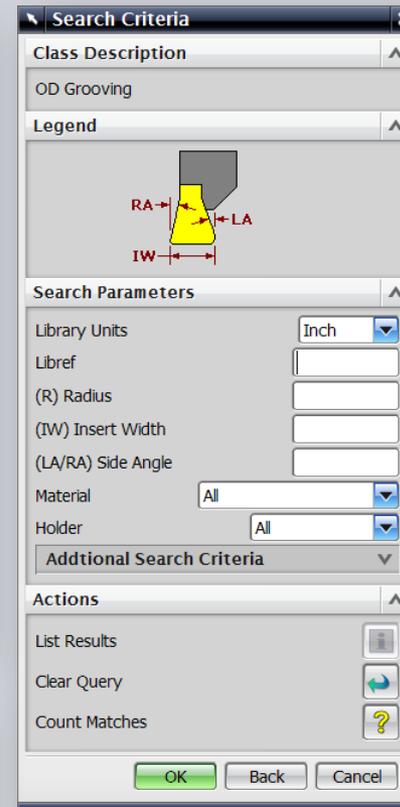
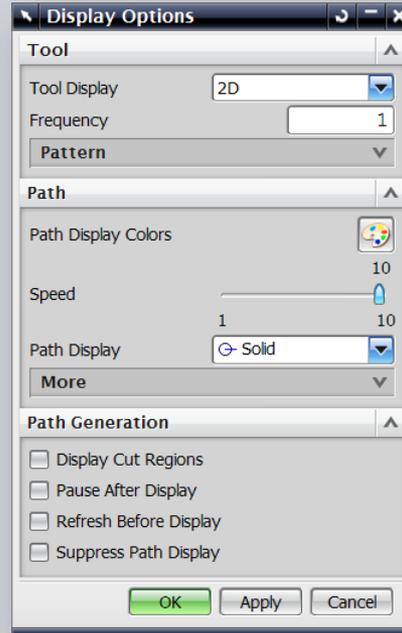
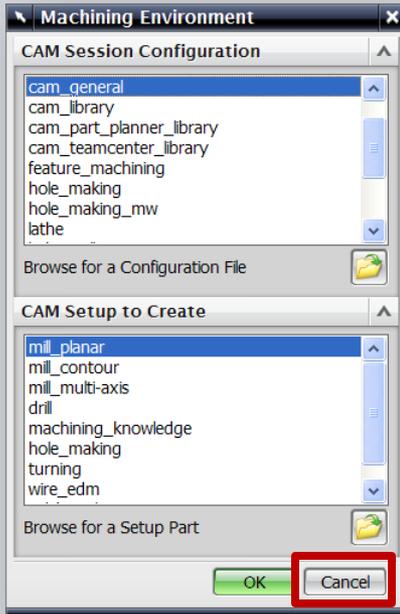


- Information → Manufacturing Setup
- Lists information stored in the setup
- Examples
  - Is this a library setup?
  - Is this an express setup?
  - Where did it come from?

```
----- Setup Information -----  
Configuration                : cam_express  
Setup Template                : Library  
Part Material Reference       : MAT0_00002  
Part Material                  : CARBON STEEL
```

# Dialogs

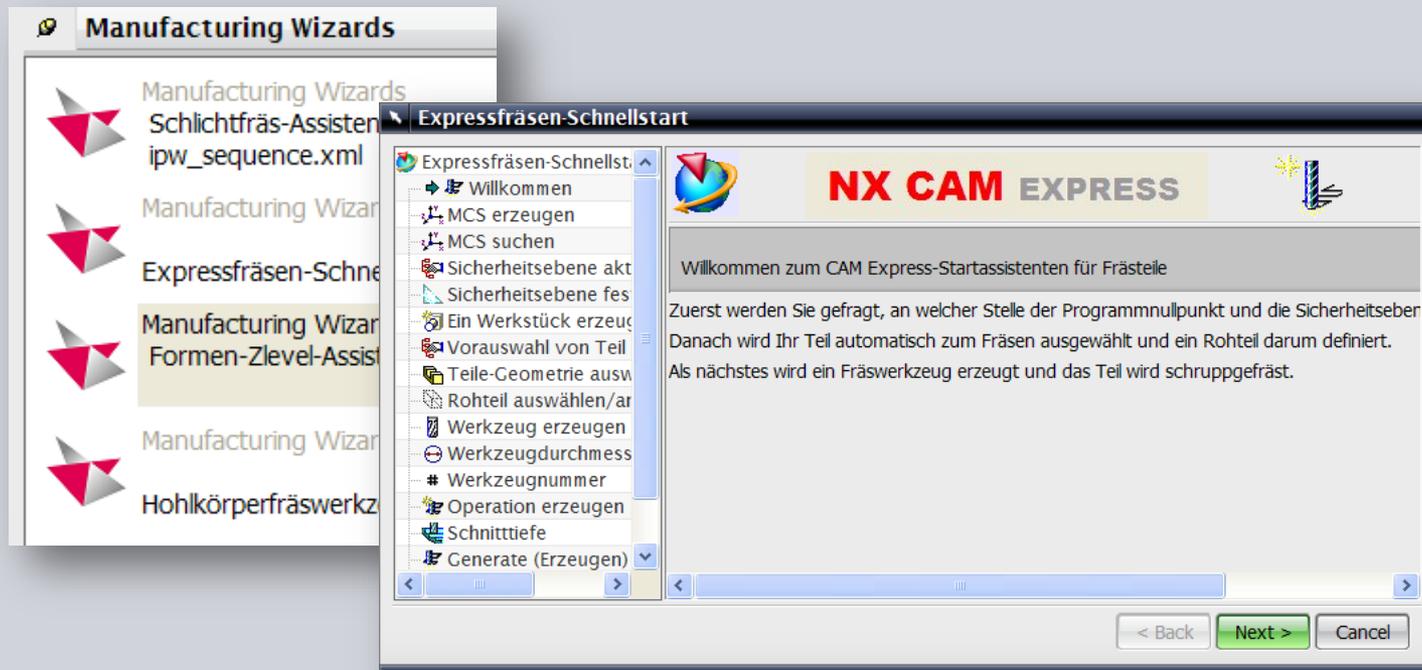
## Continue the New Look



# Dialogs

## Wizard Localization

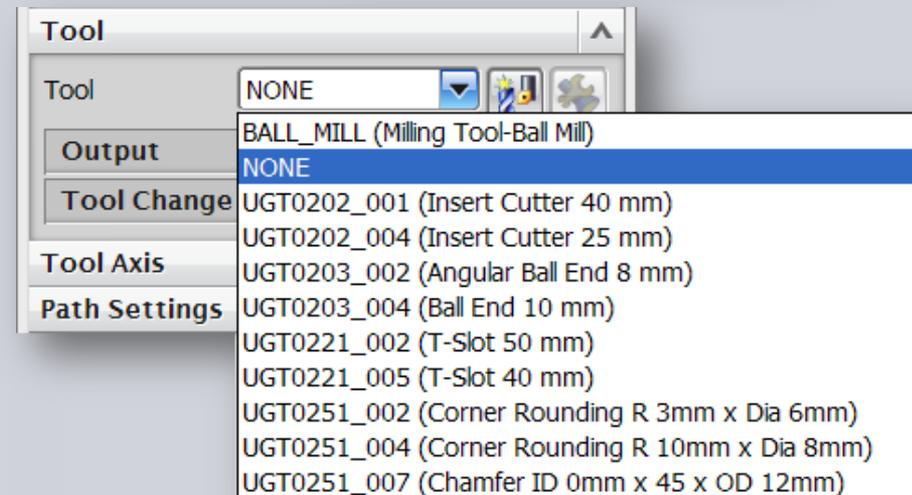
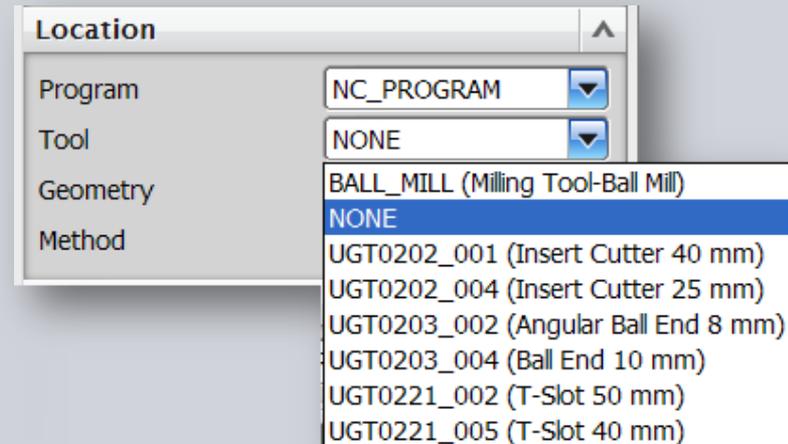
- Localized wizards are in the wizards\localization folder
- Files must be named with <Name>\_<language>.xml
- Users can add more, just follow the naming convention



# Tools

## Description in Option Lists

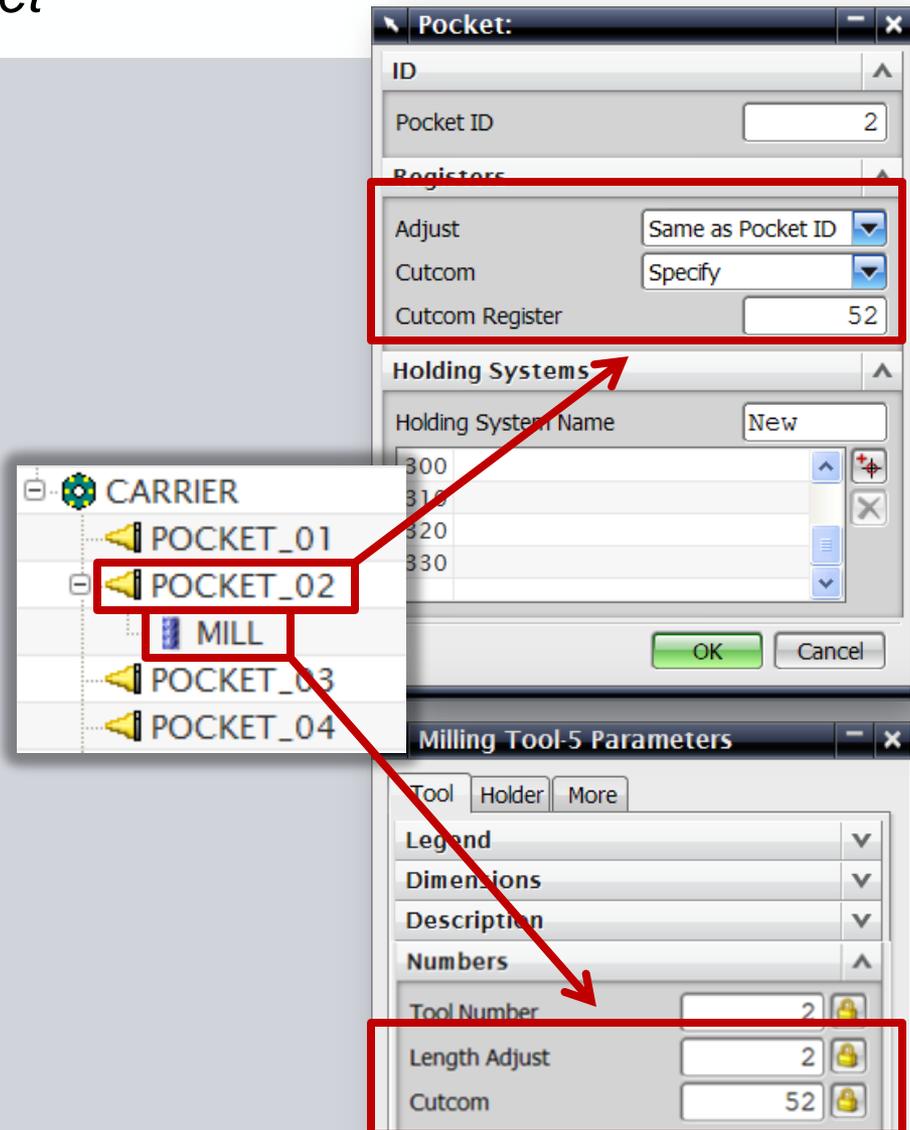
- Tool Description is shown with the Tool Name
- Helps select tools, especially library tools
  - Tool Location in Create Operation dialog
  - Tool Parent selector in Operation dialogs
- Controllable in Customer Defaults
- Reminder - You can still use the Navigator to select the parent in the Create dialog



# Tools

## *Cutcom and Adjust from the Pocket*

- Cutcom and Adjust registers
  - Inherited from the pocket to the tool
  - Can be set to match the pocket ID
- New tools and pockets will inherit
- In legacy parts, the inheritance is off if registers are set in the tool
- Inheritance from Tool to Operation is unchanged
- Not used with tracking points
- Pocket Dialog also includes holding system

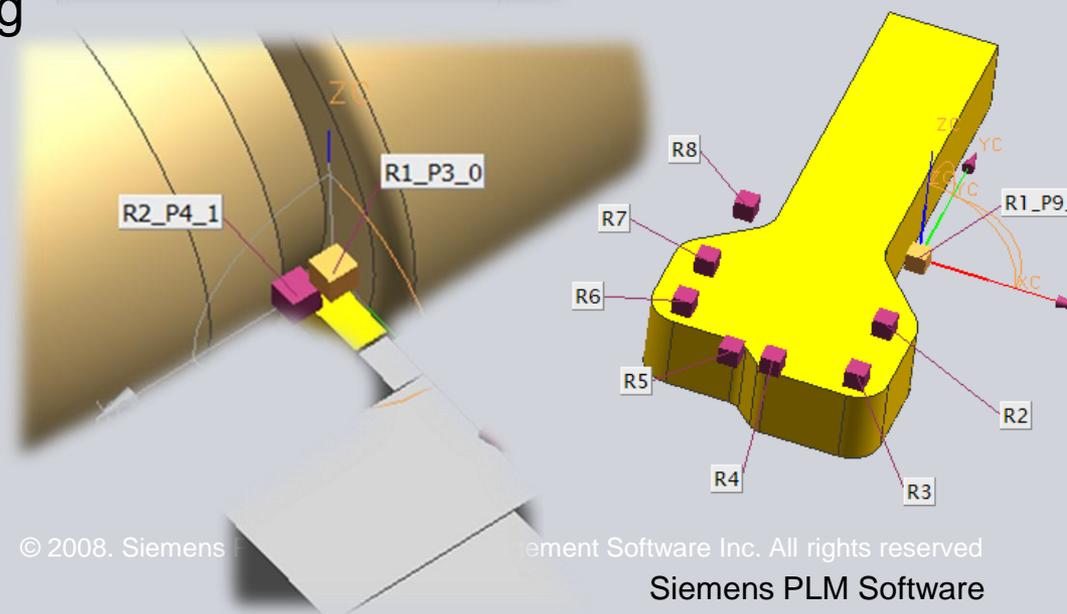
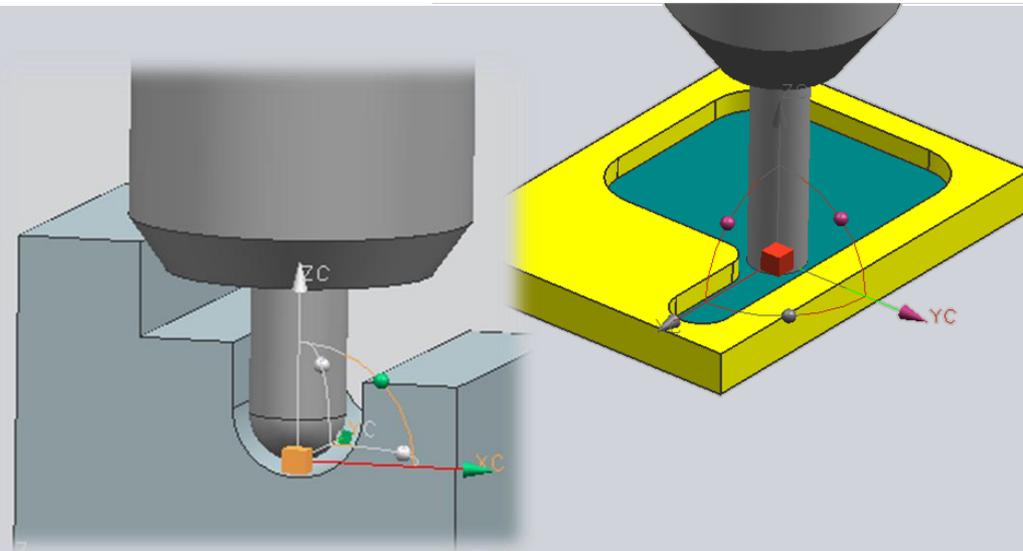


# Tools

## *Dynamic Preview Display*

SIEMENS

- Tool is displayed as true solid
- Tracking points in 3D with labels
- Pan/Zoom/Rotate the view
- Handles to move and rotate the tool
  - Validate parameters in dialog
  - Compare tool to part and fixtures - Will it fit?
- Initial display on the screen

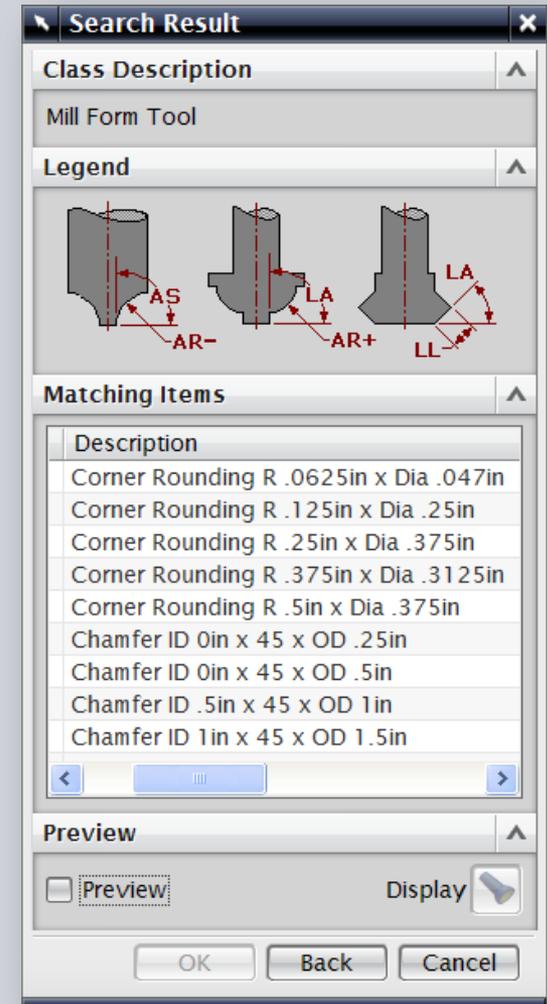
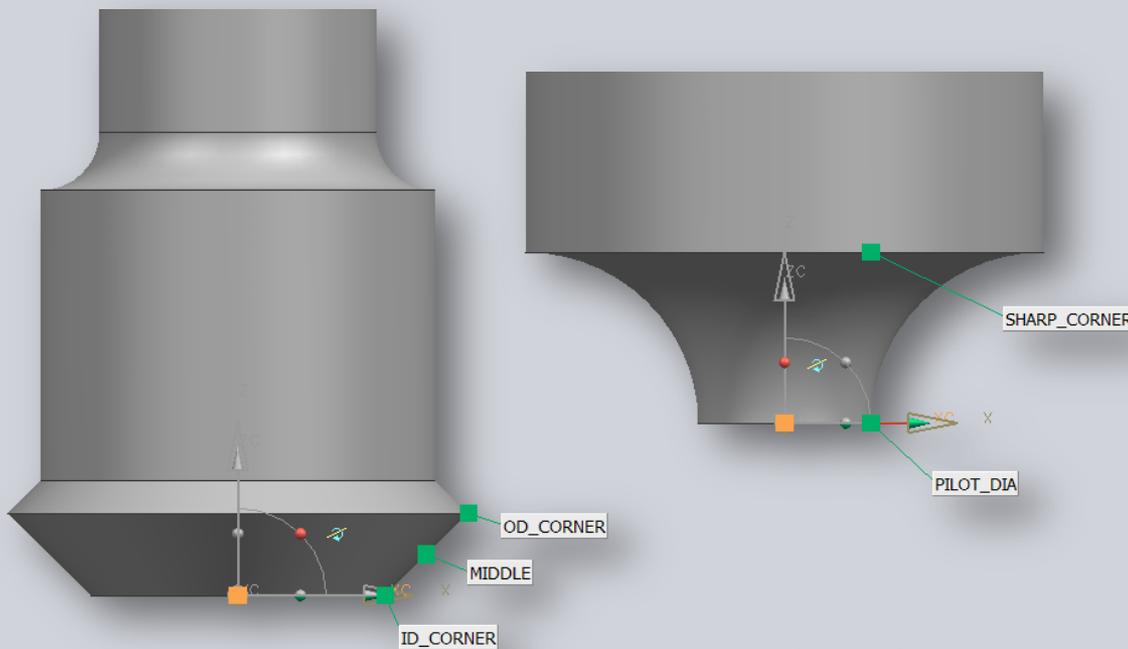


# Tool Library Content

## User Defined Milling Tools

### Sample User Defined Milling Tools in the Library

- Corner rounding
- Chamfer tools
- Meaningful tracking points



# Tool Library Content

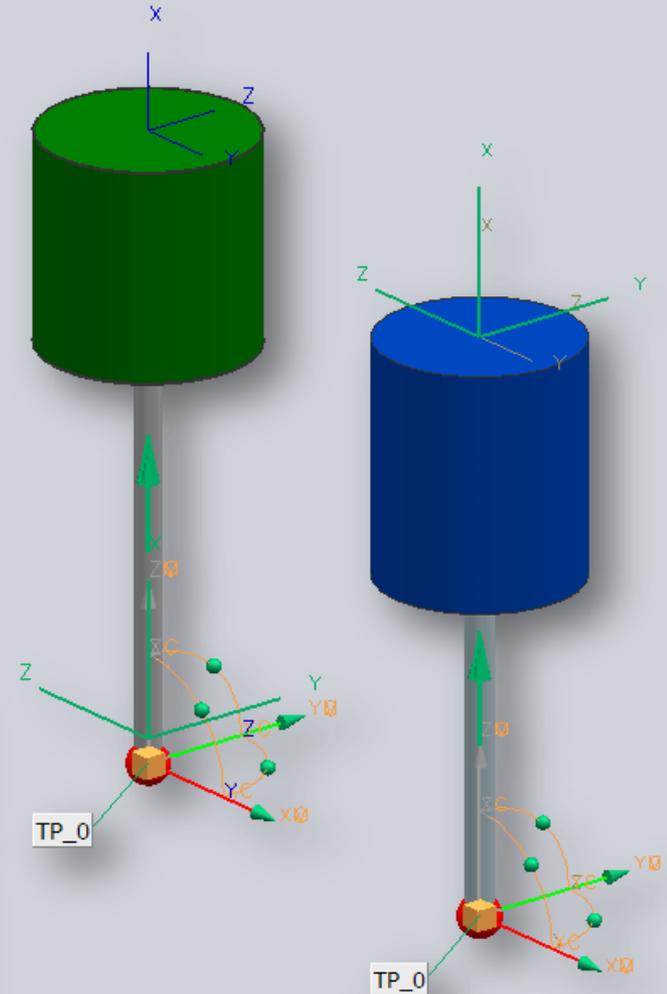
## Probes

### Sample Probes in the Library

- Generic Inch and Metric

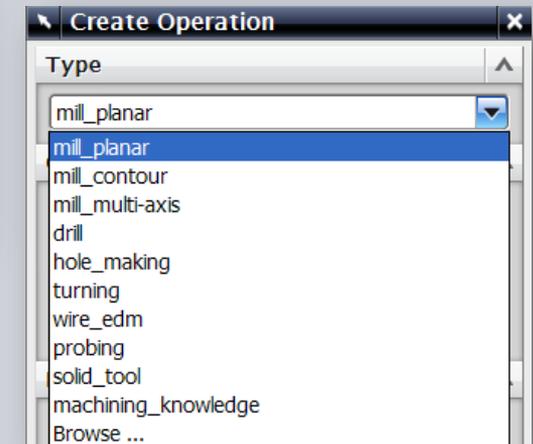
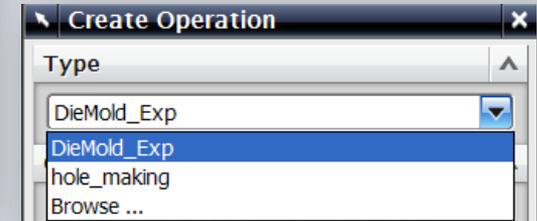
| Search Result     |                                |      |
|-------------------|--------------------------------|------|
| Class Description |                                |      |
| Probe             |                                |      |
| Matching Items    |                                |      |
| Libref            | Description                    | Pock |
| ugt0402_001       | Single tip dia 9mm x stem 72mm |      |

| Single Tip Dia .2in X Stem 2in                   |          |
|--|----------|
| Tool   | Tracking |
| Mounting Junction                                |          |
| <input checked="" type="checkbox"/> Specify CSYS |          |
| Description                                      |          |
| Single tip dia .2in x stem                       |          |
| Material : RUBY                                  |          |



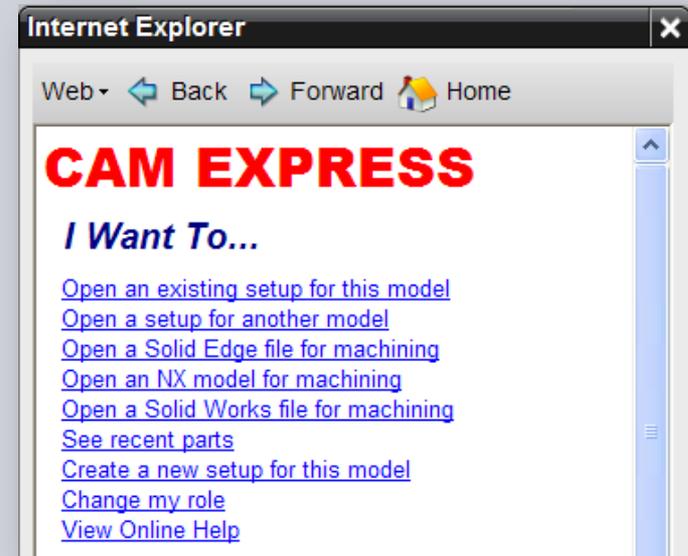
## Roles

- CAM Configuration is saved in the role
  - Native or Managed
- Changing the role changes the configuration
  - No need to go to Gateway
  - No need to reset in preferences
  - Controlled in Customer Defaults



## Welcome Screen (Home Page)

- Clearer links
- Open Solid Works files
- Better spacing in localized languages
- Opening Part Files
  - Customizable with pax file name
    - CAM\_TU\_<part\_name>.pax
    - CAM\_TU\_ASSEM\_<part\_name>.pax
  - Parts must be in mach\tutorials\parts
  - You can create a link that opens a part



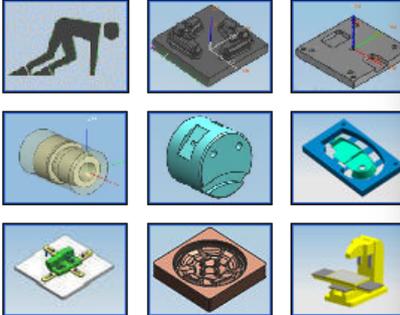
## New Tutorials

- Aerospace
  - 5 Axis bulkhead
- Mold Rework
  - Modify existing program
  - Localized machining
- High Speed Milling
  - Latest best practices
  - Machining data library
- Postprocessor
  - Download from the library
  - Install
  - Edit with Post Builder

**Teach Me About...**  
**Aerospace Machining**

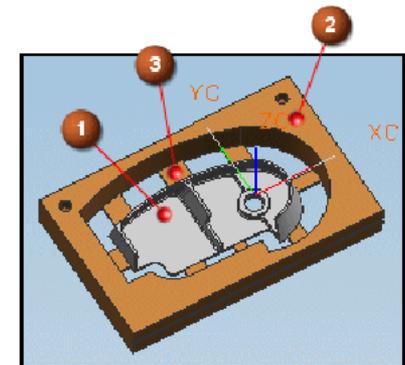
This tutorial steps you through the process of creating multi-axis tool paths on an aerospace part. You will create CONTOUR\_PROFILE operations, controlling the tool axis as it finishes undercut walls. The intent is for you to achieve a basic working knowledge of the CONTOUR\_PROFILE operation within the context of a machining workflow and to become an independent, self-sufficient user as quickly and easily as possible.

**Difficulty: Advanced**  
**Estimated time: 45 minutes**



### 5-Axis Bulkhead Machining

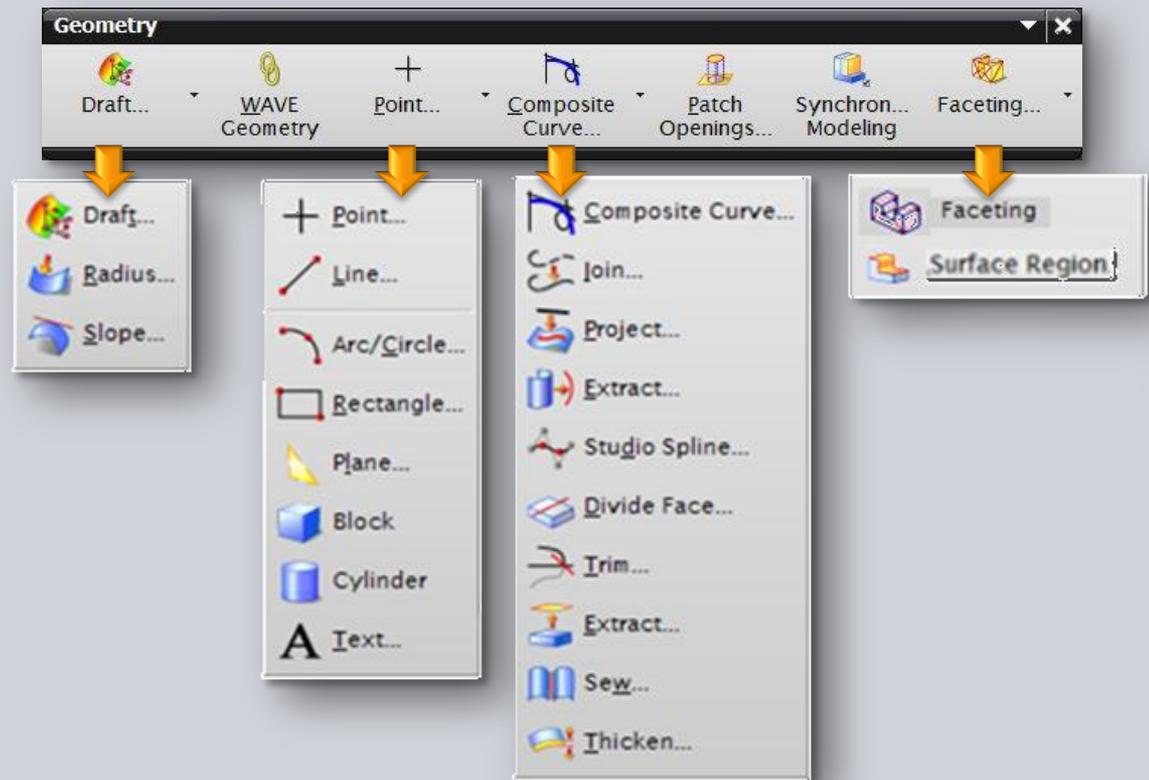
In Aerospace work, it is common to machine smaller parts in a window-frame fashion. Using this technique, the part (1) is positioned within a block of material (2) with tabs (3) left in place to secure the part during machining.



This tutorial steps you through the process of machining a bulkhead. The intent is for you to acquire a basic working knowledge of 3 and 5-axis programming techniques within the context of a bulkhead machining workflow.

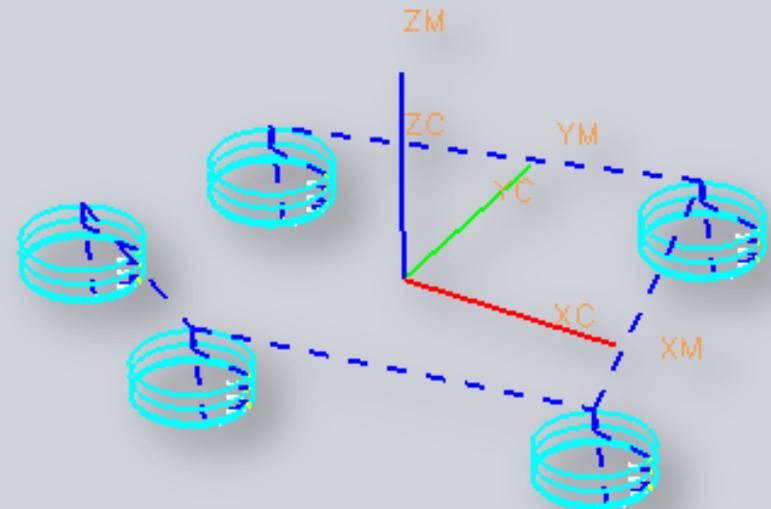
## CAD Toolbox for CAM Users

- Provide essential CAD editing tools to the CAM user
  - Move existing geometry functions to one location
  - Add Model editing for machining
    - Synchronous Modeling
    - Patch openings



## Thread Milling Update

- Manual Thread Milling
  - Locations from Drill geometry group
  - Pitch comes from Tool
  - User defined parameters, without dependency on thread tables or features
  - Option to start at center
  - Parameters preserved in templates and copy/paste
- Geometry group template to capture tools, parameters, and operations.
- Still planning replacement in NX7



**Thank You**