SIEMENS
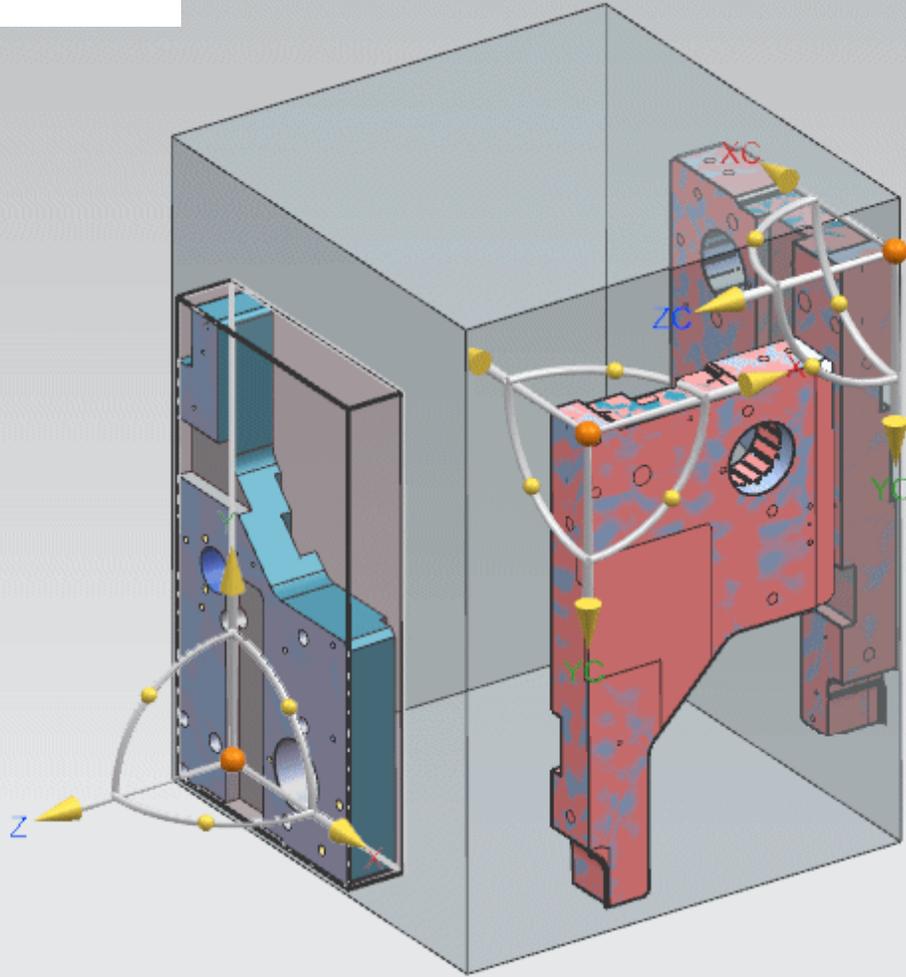
NX CAM 11:
IPW Transfer Enhancements

Explicitly locate and orient the IPW when machining multiple parts.

Answers for industry.

About NX CAM

NX^{TM} CAM software has helped many of the world's leading manufacturers and job shops produce better parts faster. You can also achieve similar benefits by making use of the unique advantages NX CAM offers.

This is one of many hands-on demonstrations designed to introduce you to the powerful capabilities in NX CAM 11. In order to run this demonstration, you will need access to NX CAM 11.

Visit the NX Manufacturing Forum to learn more, ask questions, and share comments about NX CAM.

Hands-on Demonstration: IPW Transfer Enhancements

You can now explicitly locate and orient the in-process workpiece (IPW) when transferring it from one mounting position to another to machine multiple parts. Previously, NX could only position the IPW automatically by referencing the same part. The transferred IPW no longer requires you to specify a part, allowing you to either machine the IPW independent of the part geometry or to specify part geometry that is different from the previous as in staged models.
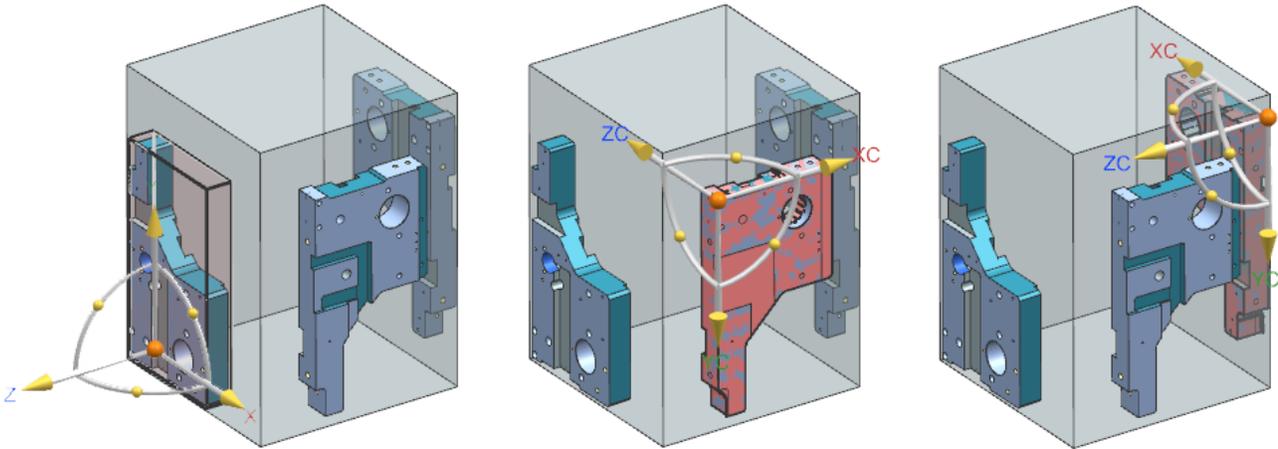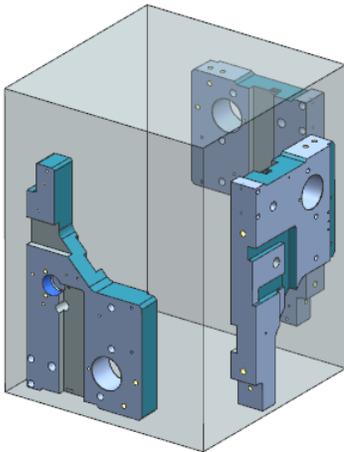
Prerequisites:

1. You will need access to **NX CAM 11** in order to run this demonstration.
2. If you haven't done so already, download and unzip **ipw_transfer_enhancements.7z**.

Demo:

1. Open **ipw_assemby.prt** in NX.

   Note: If the mounting block is not translucent as shown below, choose
   Menu→Preferences→Visualization, click the **Visual** tab, and select the **Translucency** check box.


Examine the assembly

The assembly contains two different parts mounted on a block. The first part is mounted to face 1 and face 2. The mounting on face 1 machines the top of the part. The mounting on face 2 machines the bottom of the same part. The second part is mounted to face 3. This part is similar to the first, but requires some additional machining. Staging the model in this way allows this part to use the same IPW as the previously machined part.
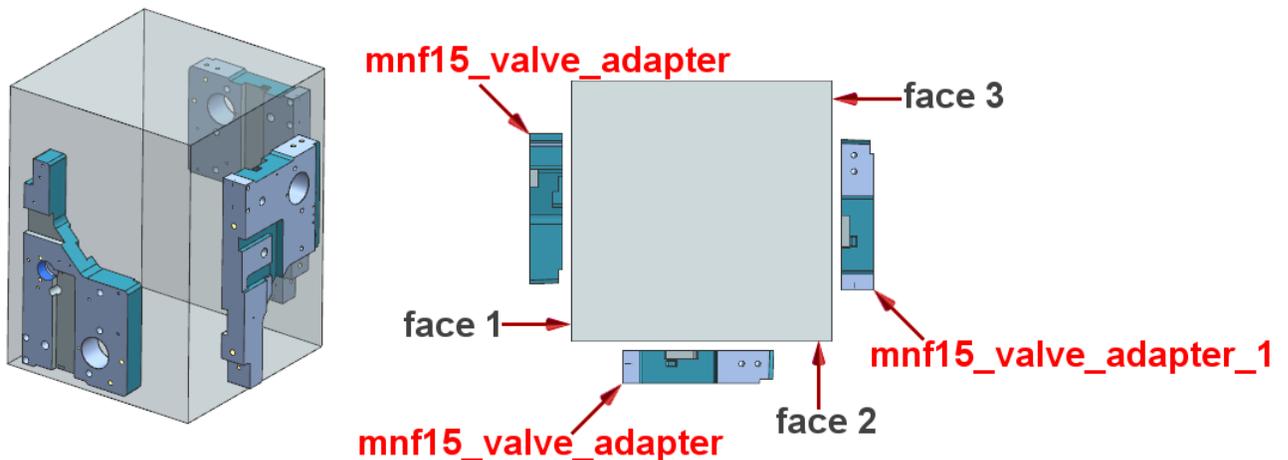
Examine the MCS for each workpiece

The Machine Coordinate System (MCS) defines the coordinate system in which the tool paths are output. Each workpiece in the setup requires an MCS with the same relative position and orientation to the mounting face.

2. In the **Geometry View** of the Operation Navigator, click **MCS_1**, **MCS_2**, and **MCS_3** to see the position and orientation of each MCS.

MCS_1   MCS_2   MCS_3
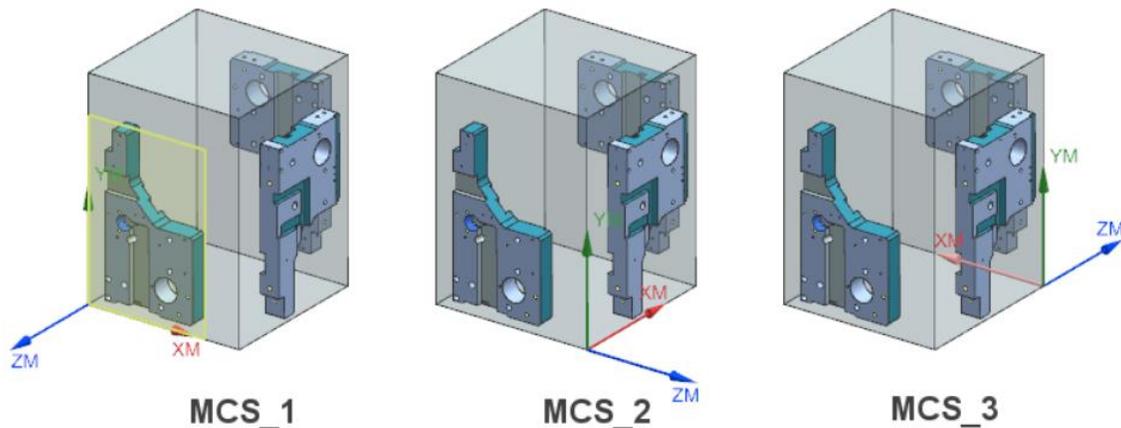
Examine the IPW for WORKPIECE1

3. Double-click **WORKPIECE1** to edit the object.

4. Click **Specify Blank** .

   The IPW Position section of the dialog box is new. Notice that the Positioning Type is set to CSYS. This is a new option that allows you to explicitly position the IPW when it is transferred from one WORKPIECE group to another.
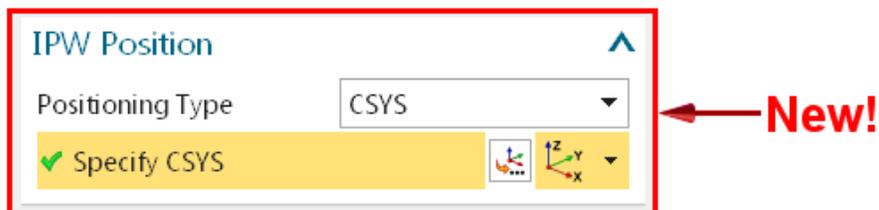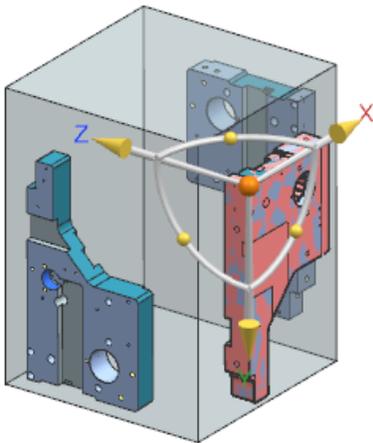

5. Click **Specify CSYS** .

The CSYS for the IPW is positioned at the corner on the back side of the part.
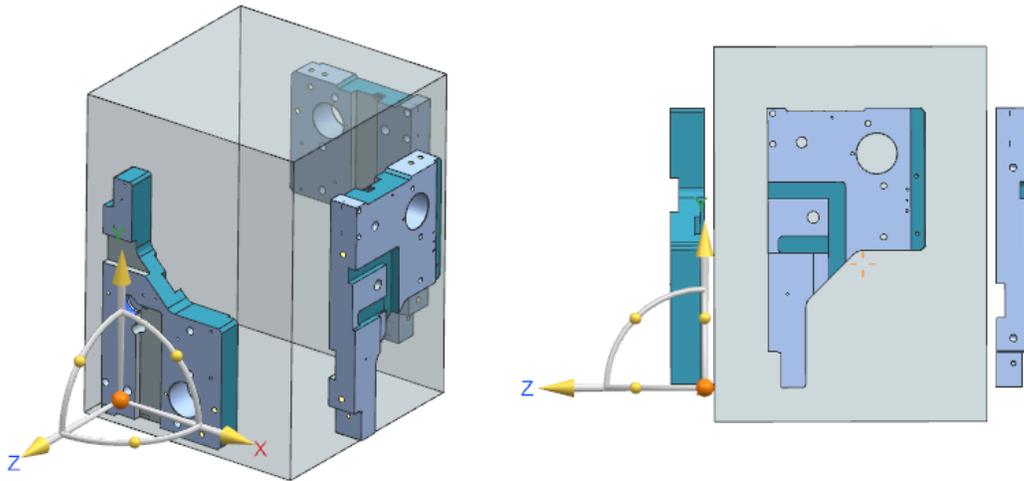
6. Click **Cancel** in the **CSYS** dialog box.
7. Click **Cancel** in the **Blank Geometry** dialog box.
8. Click **Cancel** in the **Mill Geom** dialog box.

Create WORKPIECE2

You will create a workpiece group for the part mounted on face 2 and position the IPW using the same orientation relative to the part as the CSYS in WORKPIECE1.
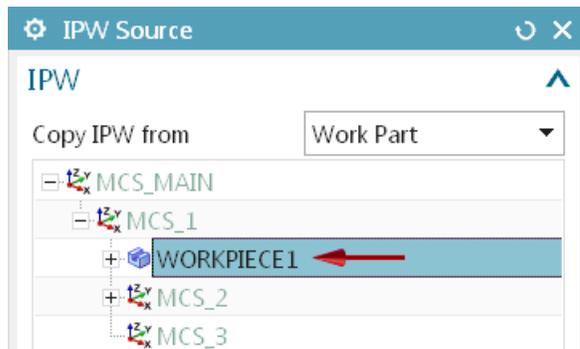

9. Click **Create Geometry**.
10. Select **mill_planar** from the **Type** list.
11. Click **Workpiece** 📇.
12. Select **MCS_2** from the **Geometry** list.
13. Type **WORKPIECE2** in the **Name** box.
14. Click **OK**.

Specify the IPW source and position

15. Click **Specify Blank** .
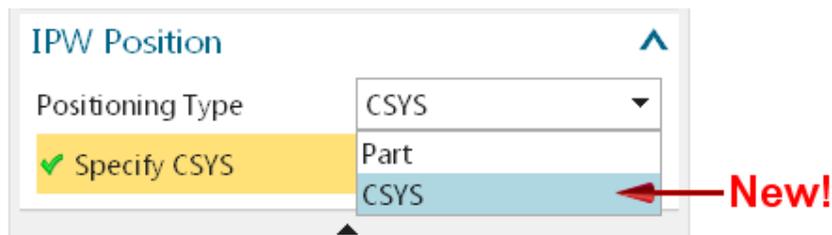16. Select **IPW-In Process Workpiece** from the **Type** list.

17. Click **Select Source for IPW** .
18. Click **WORKPIECE1** as the IPW source.

19. Click **OK**.

There are now two positioning types; **Part** and **CSYS**.

The **CSYS** option is new. It allows you to explicitly position the IPW when it is transferred from one WORKPIECE group to another. It maintains associativity between the IPW positions and does not require you to define part geometry. This option may be used when the part geometry in the target IPW is different from the part geometry in the source IPW.

The **Part** option retains the behavior from previous releases. NX automatically positions the IPW when transferring from one WORKPIECE group to another and maintains associativity between the IPW positions. This option is simple to use because of the automatic IPW positioning, but it can only be used when the part geometry in the target IPW is the same as the part geometry in the source IPW.

Notice that the Positioning Type is set to CSYS. This occurs because the specified IPW source (WORKPIECE1) uses CSYS as the Positioning Type. The Positioning Type for the target workpiece must be the same as that of the source. If it is not, you will receive an Alert when you click Update Local IPW from Source.
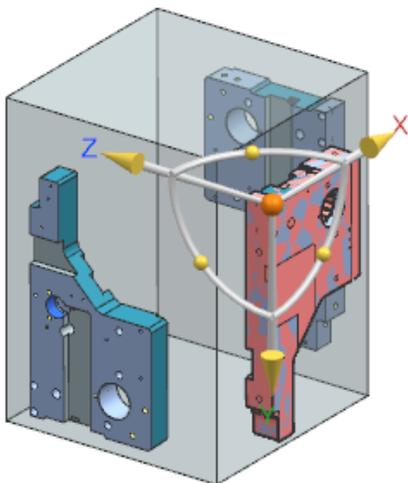

20. Move the CSYS to the corresponding corner of the part mounted on face 2 of the block and rotate the CSYS so that it has the same orientation relative to the part as the CSYS in WORKPIECE1.
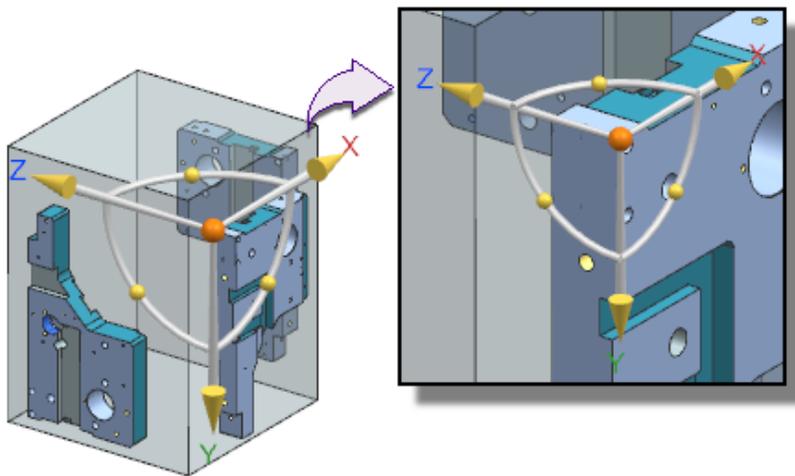

21. Click **Update Local IPW from Source** .

The IPW should correspond to the position and orientation of the part.

22. Click **OK** in the **Blank Geometry** dialog box.
23. Click **OK** in the **Workpiece** dialog box.

Machine the bottom of the part

24. Copy the **CAVITY_MILL** operation and paste it inside **WORKPIECE2**.
25. Rename the operation **CAVITY_MILL_2**.
26. Double-click **CAVITY_MILL_2** to edit the operation.
27. Click **Specify Part** .
28. Select the part geometry mounted on face 2.
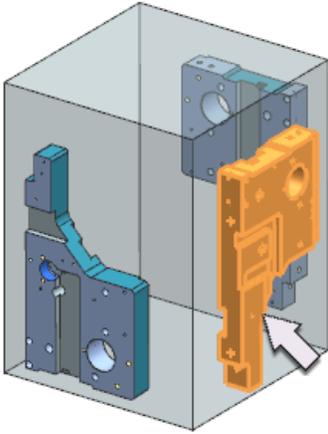
29. Click **OK**.
30. Select **MILL_30MM** from the Tool list.
31. Click **Generate**.
32. Click **OK** in the **Operation Edit** dialog box.
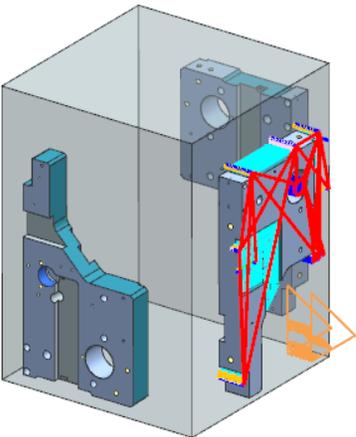
33. Click **OK** to complete the operation.

Create WORKPIECE3

You will create a workpiece group for the part mounted on face 3 and position the IPW using the same orientation relative to the part as the CSYS in WORKPIECE2. This is a different part that has an additional face that requires machining.
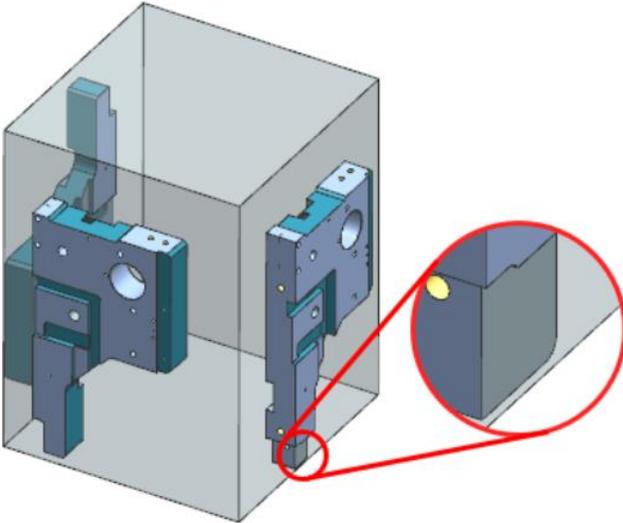
34. Click **Create Geometry**.
35. Click **Workpiece**.
36. Select **MCS_3** from the **Geometry** list.
37. Type **WORKPIECE3** in the **Name** box.
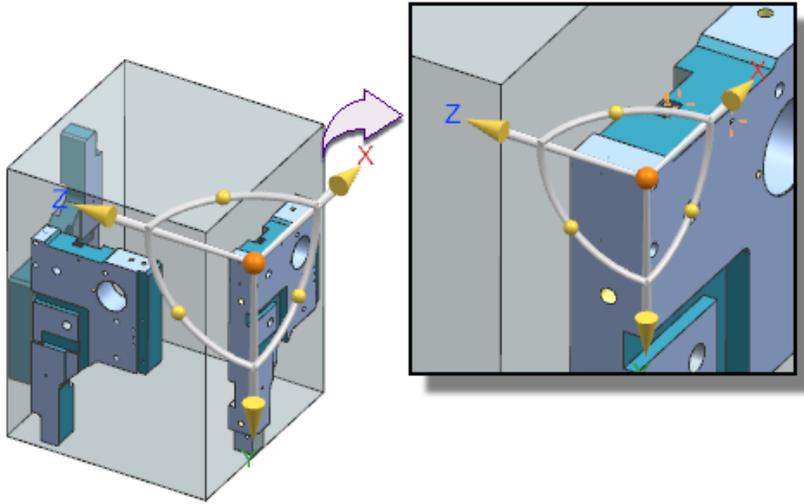38. Click **OK**.

Specify IPW source and position

39. Click **Specify Blank** .
40. Select **IPW-In Process Workpiece** from the **Type** list.
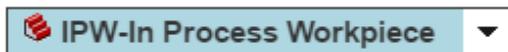
41. Click **Select Source for IPW** .
42. Click **WORKPIECE2** as the IPW source.
43. Click **OK** in the **IPW Source** dialog box.
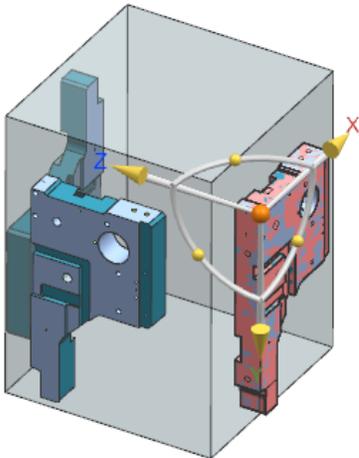44. Select **Entire Assembly** from the **Selection Scope** list.

45. Move the CSYS to the corresponding corner of the part mounted on face 3 of the block and rotate the CSYS so that it has the same orientation relative to the part as the CSYS in WORKPIECE1 and 2.

46. Click **Update Local IPW from Source** .

The IPW should correspond to the position and orientation of the part.

47. Click **OK** in the **Blank Geometry** dialog box.
48. Click **OK** in the **Workpiece** dialog box.

Machine the part

49. Copy the **CAVITY_MILL_2** operation and paste it inside **WORKPIECE3**.
50. Rename the operation **CAVITY_MILL_3**.
51. Double-click **CAVITY_MILL_3** to edit the operation.
52. Click **Specify Part**.
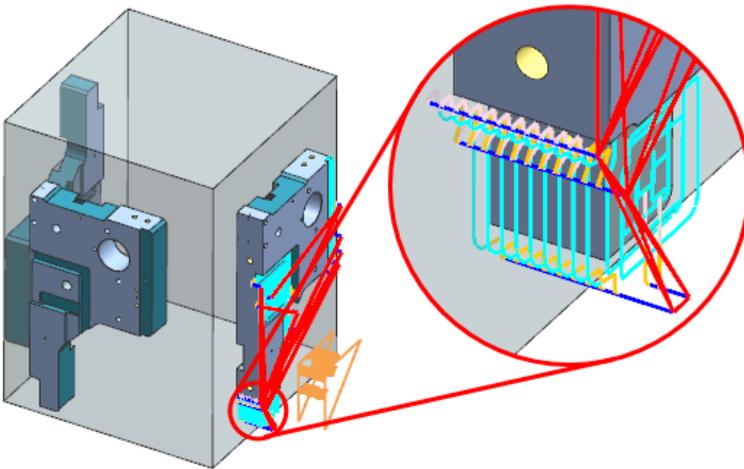53. Click **Remove** .

54. Select the part geometry mounted on face 3.
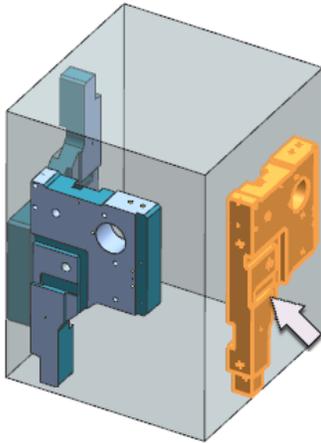
55. Click **OK**.
56. Click **Generate**.
57. Click **OK** in the **Operation Edit** dialog box.

58. Click **OK** in the operation dialog box.
59. Close the part without saving.

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