

Siemens PLM Software

NX CAM 9.0.3: Band Width for Drilling Sequence Optimization

Specifying hole alignment tolerance for zig and zig zag patterns.

About NX CAM

NX™ 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.

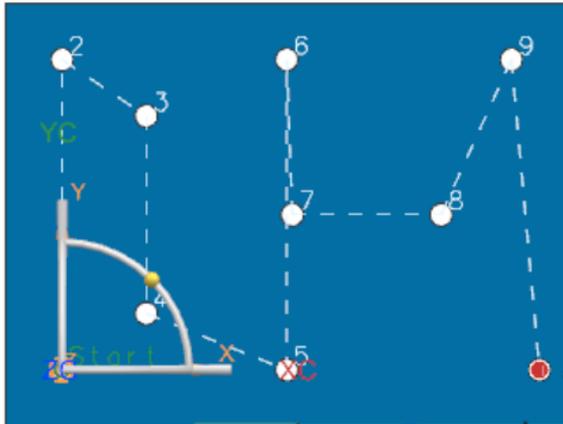
This is one of many hands-on demonstrations designed to introduce you to the powerful capabilities in NX CAM 9.0.3. In order to run this demonstration, you will need access to NX CAM 9.0.3.

Visit the [NX Manufacturing Forum](#) to learn more, ask questions, and share comments about NX CAM.

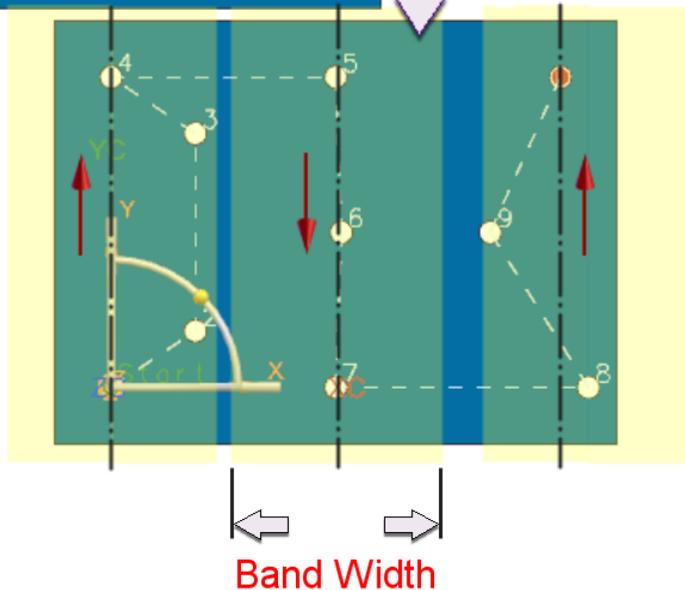
Hands-on Demonstration: Band Width for Drilling Sequence Optimization

The new Band Width option allows you to eliminate unwanted passes caused by holes that are not aligned when machining zig and zig zag hole patterns. This value is a tolerance that allows zig or zig zag passes to deviate within a specified width to include holes in each pass that are not perfectly aligned.

Zig Zag, Band Width = 0



Zig Zag, Band Width = 60

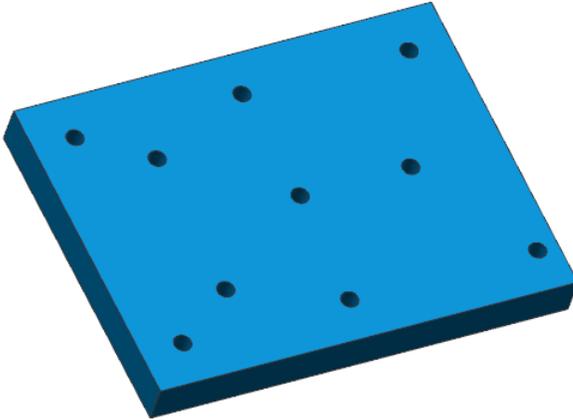


Prerequisites:

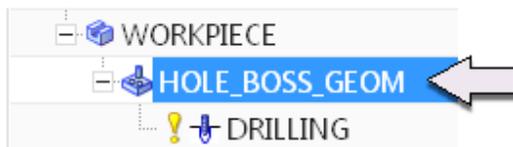
1. You will need access to **NX CAM 9.0.3** in order to run this demonstration.
2. If you haven't done so already, download and unzip **bandwidth_for_drilling_sequence_optimization.7z**.

Demo:

1. Open **band_width.prt** in NX.



2. In the background of the graphics window, right-click and choose **Orient View→Top**.
3. In the Geometry View of the Operation Navigator, double-click **HOLE_BOSS_GEOM** to edit the geometry parent.



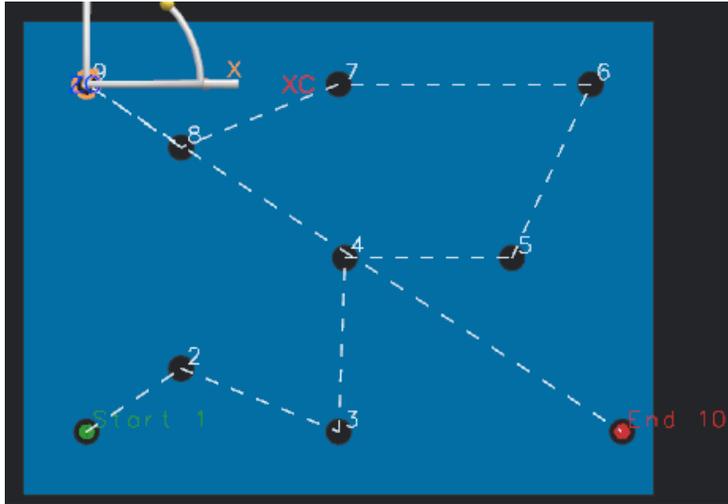
4. Select any item in the list.



This will clear the feature CSYS vectors from the screen.

Note: To prevent the CSYS for each feature from displaying, you can also display the Machining Feature Navigator, MB3 on the background→Show Feature CSYS to turn it off.

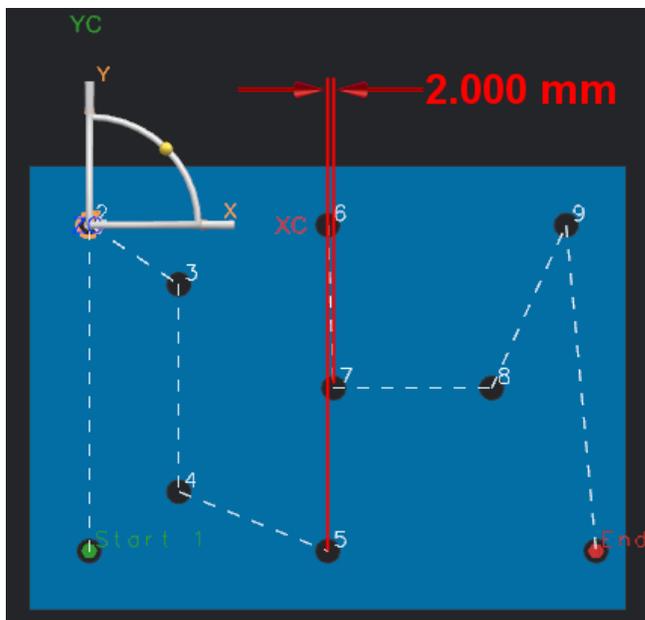
5. Click **Display** .



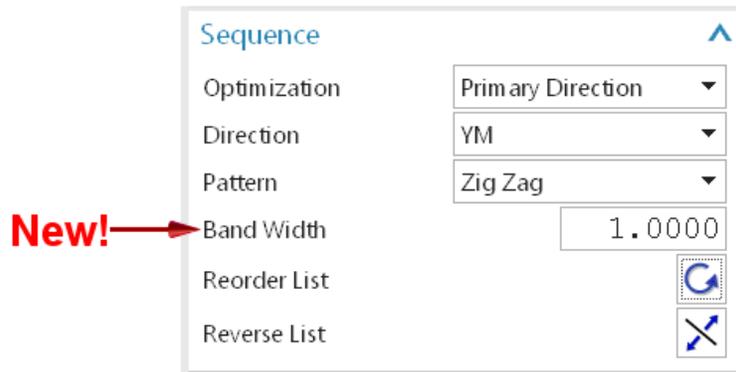
You will edit this list to define a more efficient and orderly sequence and then reload it into the operation.

6. In the Sequence section of the dialog box, select **Primary Direction** from the **Optimization** list.
7. Select **YM** from the **Direction** list.
8. Select **ZigZag** from the **Pattern** list.
9. Click **Reorder List** .

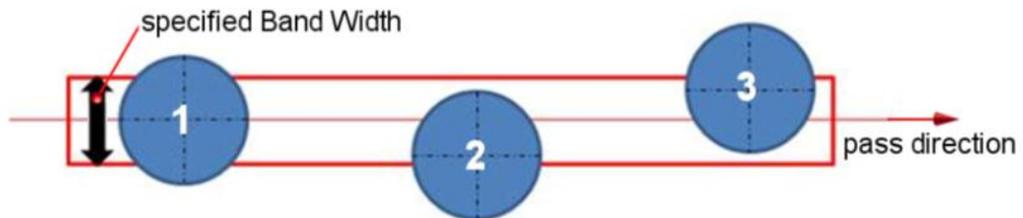
Because the center hole (7) is 2.000mm out of alignment with the other two holes (5 & 6), the tool path cannot include it in a single pass.



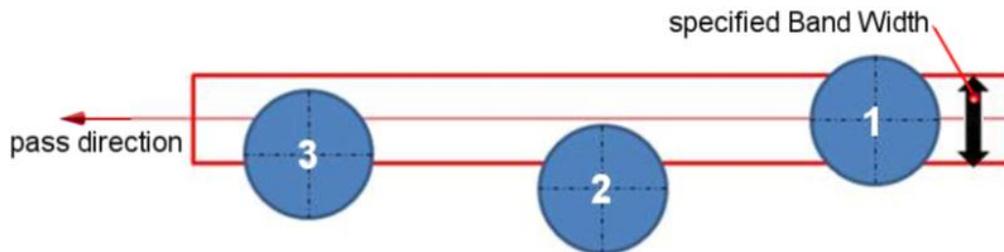
Band Width is a hole alignment tolerance that allows the zig or zig zag passes to deviate within a specified width to include holes in each pass that are not perfectly aligned such as hole 7.



The Band Width center is referenced from the center point of the first hole in the band.



Starts with #1 (Dictates the center line) → #2 & #3 are included.
Their center lies within the band



Same Band Width but order reversed → Starts with #1 (Dictates the center line)
#2 is now excluded since it's center is outside the band

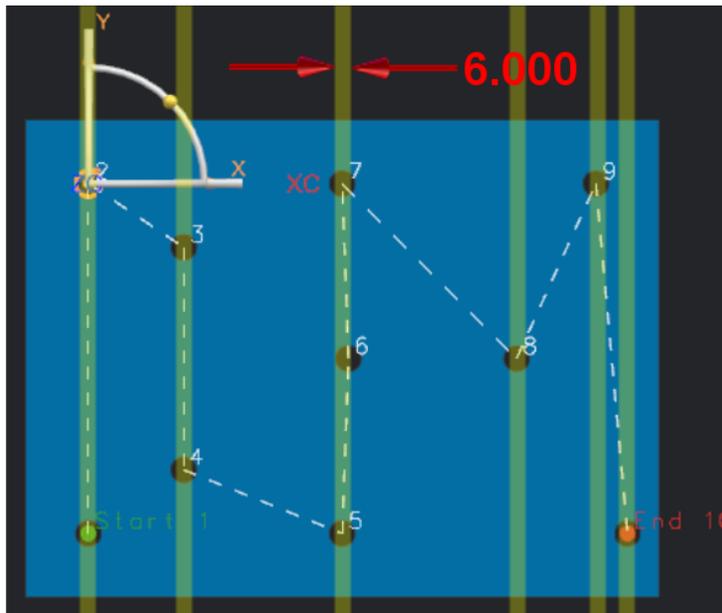
The currently specified Band Width is too narrow to include holes 5, 6, and 7 in a single band.

10. Type **6.000** in the **Band Width** box.

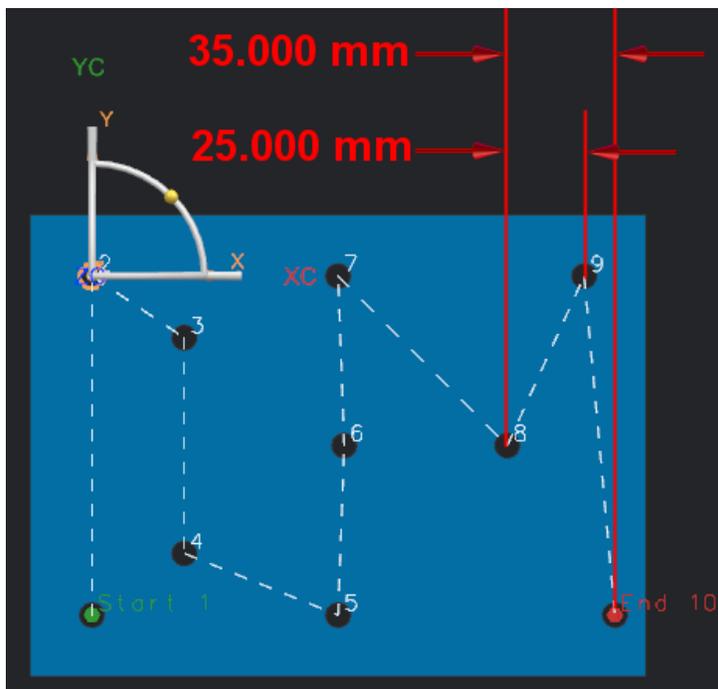
Hole 5 is the first of the three holes in the band, so the Band Width is offset to each side of it.

11. Click **Reorder List** .

The Band Width (centered on hole 5) is now wide enough to include the center points of all three holes (5, 6, & 7). The sequence is reordered so that holes 5, 6, and 7 are drilled in a single pass.



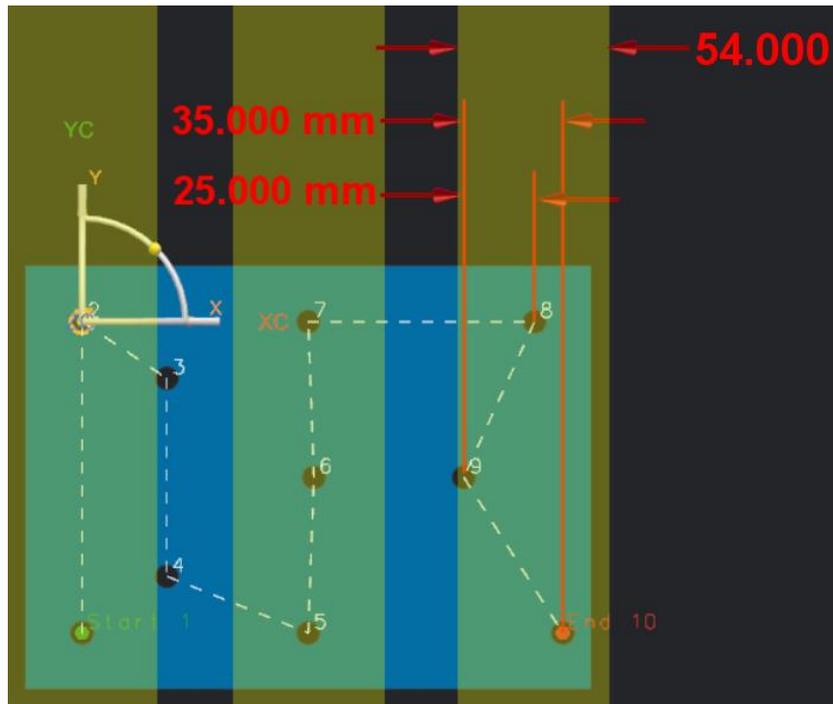
The three holes on the right side of the part are much further out of alignment. They require a much larger Band Width to be included in a single pass.



12. Type **54.000** in the **Band Width** box.

13. Click **Reorder List** .

In this case, reordering changes the position of hole 8. With the band now centered on this new first position, the 54.000 mm Band Width includes all three holes (8, 9, & 10) in a single pass.



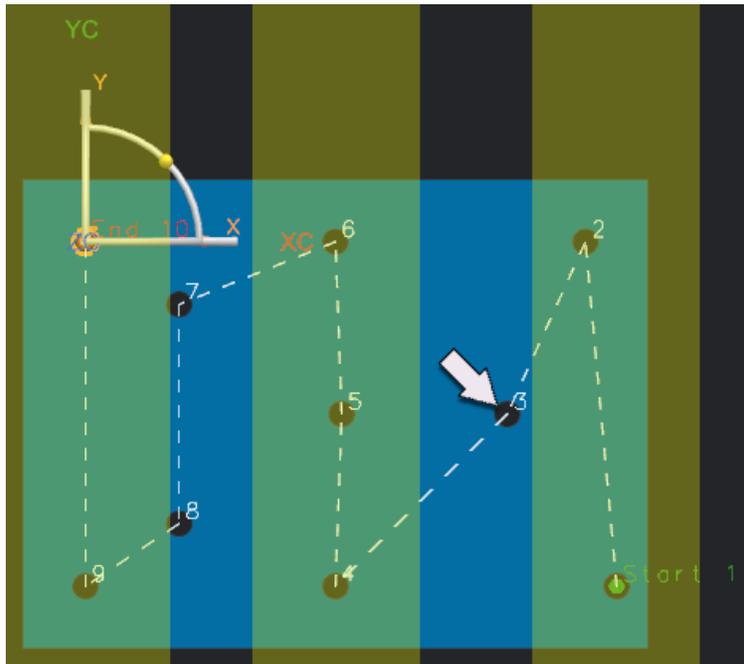
To further illustrate how the band centers on the first hole within the band, you will reverse the order of the list so that the first of these three holes is at the lower right corner.

14. Click **Reverse List** .

The Start and End points of the tool path have been reversed. The first point in the band (hole 1) is now at the lower right corner. As a result, the band will center on this hole.

15. Click **Reorder List** .

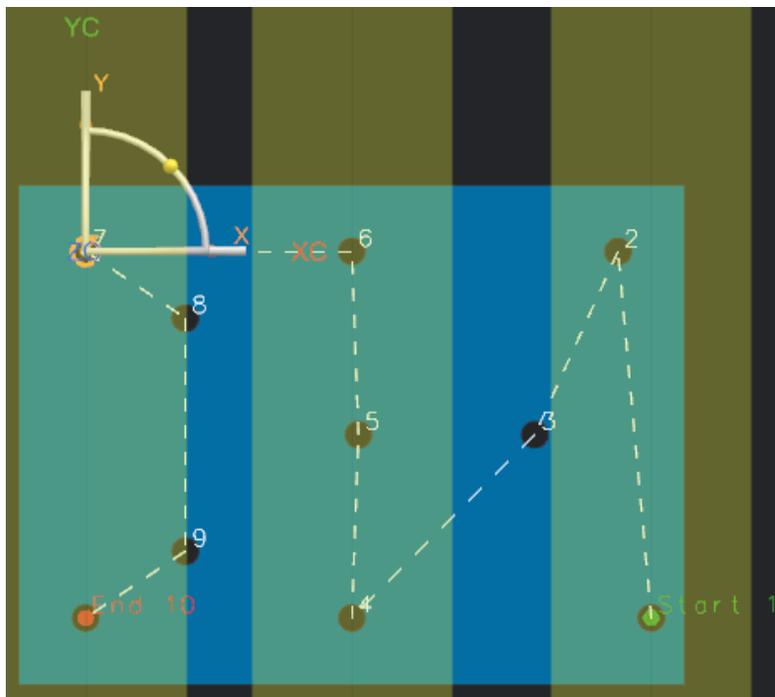
Once reordered, the band shifts to the right, centering on the first hole. The third hole (now hole 3) is no longer contained inside the band. As a result, the three holes are no longer drilled in a single pass.



16. Type **60.000** in the **Band Width** box.

17. Click **Reorder List** .

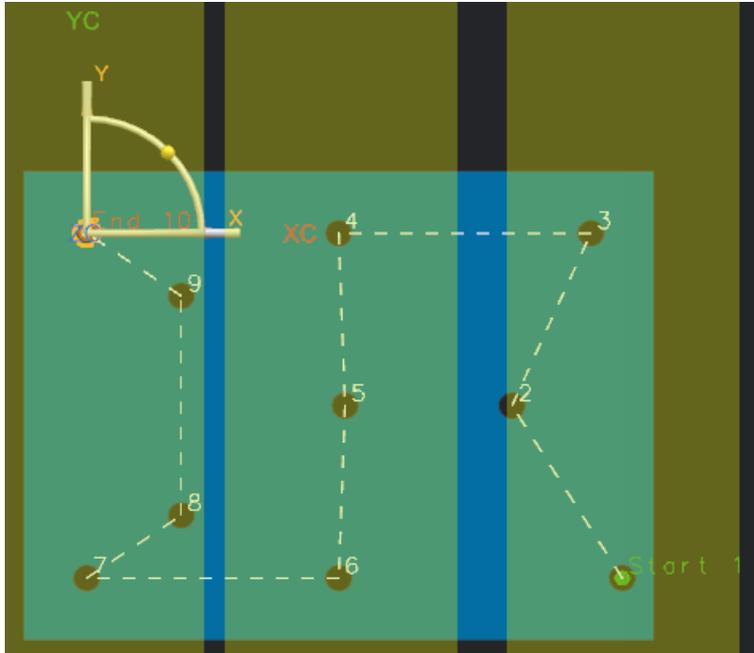
This Band Width is now wide enough to contain holes 7-10, but still not wide enough to contain holes 1-3. Holes 7-10 are now drilled in a single pass.



18. Type **70.000** in the **Band Width** box.

19. Click **Reorder List** .

Holes 1-3, 4-6, and 7-10 are each within the band width and are each drilled in a single pass.



20. Click **OK** in the Hole or Boss Geometry dialog box.

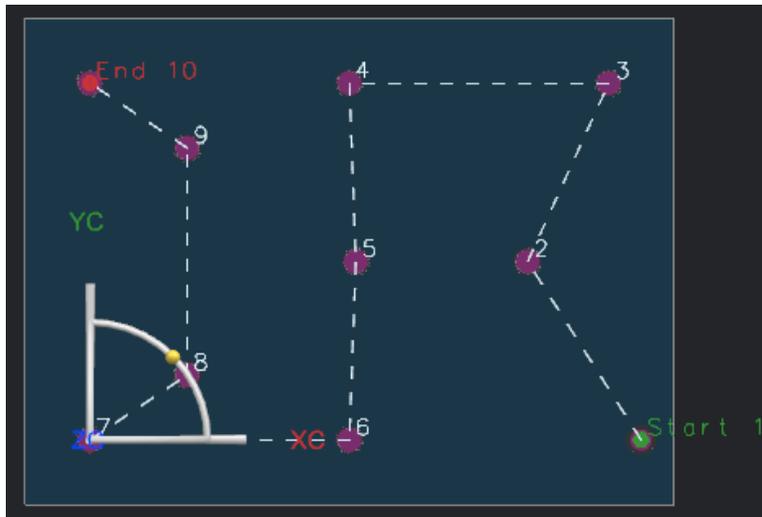
Now you will reload the edited list into the operation.

21. Double-click **DRILLING** to edit the operation.

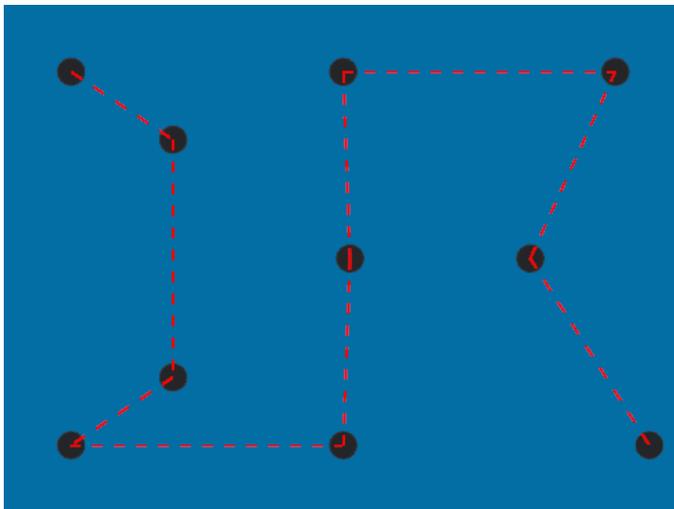
22. Click **Specify Feature Geometry** .

23. Click **Reload List From Parent** .

The sequence in the operation now matches the sequence defined in the geometry parent.



24. Click **OK** in the Feature Geometry dialog box.
25. Click **Generate**.



26. Click **OK** to complete the operation.
27. When you have finished practicing, close the part without saving

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