Creating Landmarks for U-Tubed Components in MakeComp

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Purpose

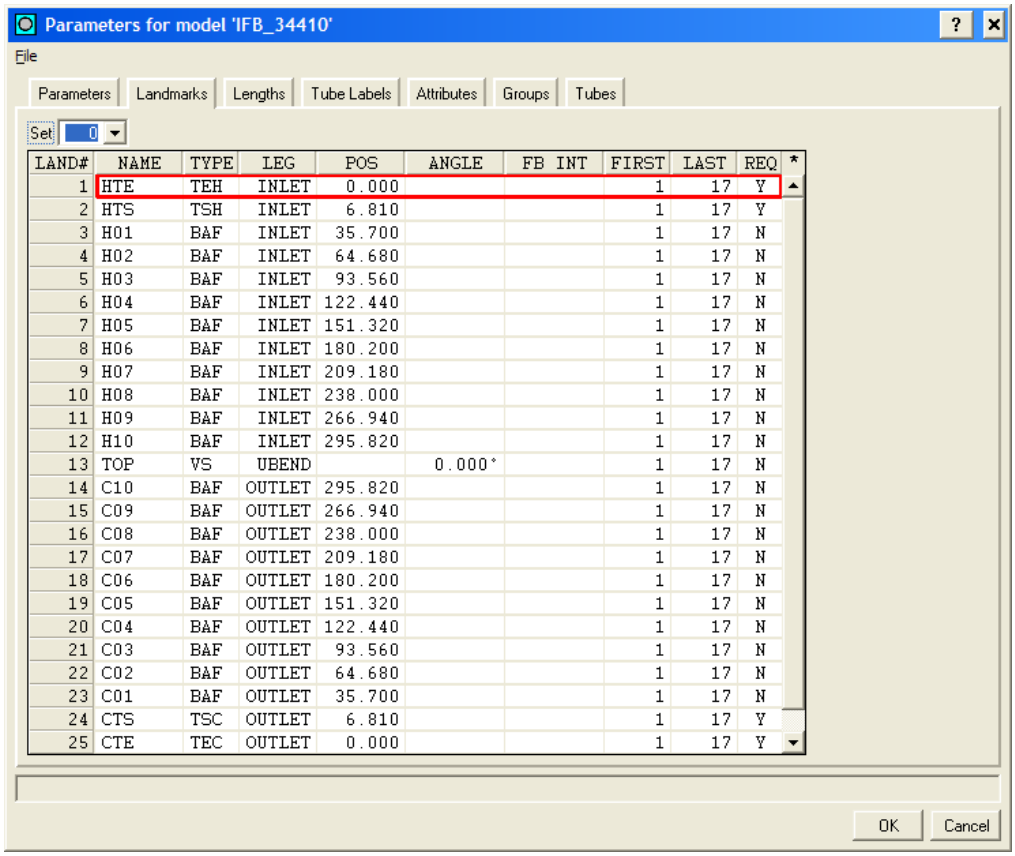
This note describes how to create landmarks for a component with U-bends.

Procedure

For a U-tubed component, the best way to setup the landmark table is to create only one landmark set that has both hot and cold leg landmarks in it. Do the following in the MakeComp software:

1. In the **Parameters** tab of the main **PARAMETERS** button, ensure **Has Ubends** is selected. This is necessary for the software to make correct u-bend calculations. For calculations to show up on the Tubes tab, ensure that the save command is executed before looking at the Tubes tab.

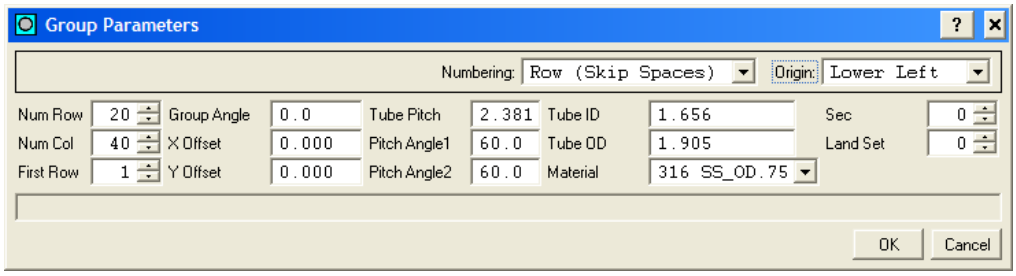
2. In the **Landmarks** tab, insert all landmarks of the component. It is important that the **INLET** leg has type **TEH** for the inlet tube end and the **OUTLET** leg has **TEC** for the outlet tube end. The name field can be anything you desire. For example, if the inlet leg is actually the cold leg, the name could be CTE but the type must be TEH. Keep in mind that the auto locate software always references the type field. It is recommended that the name field has no more than four characters.



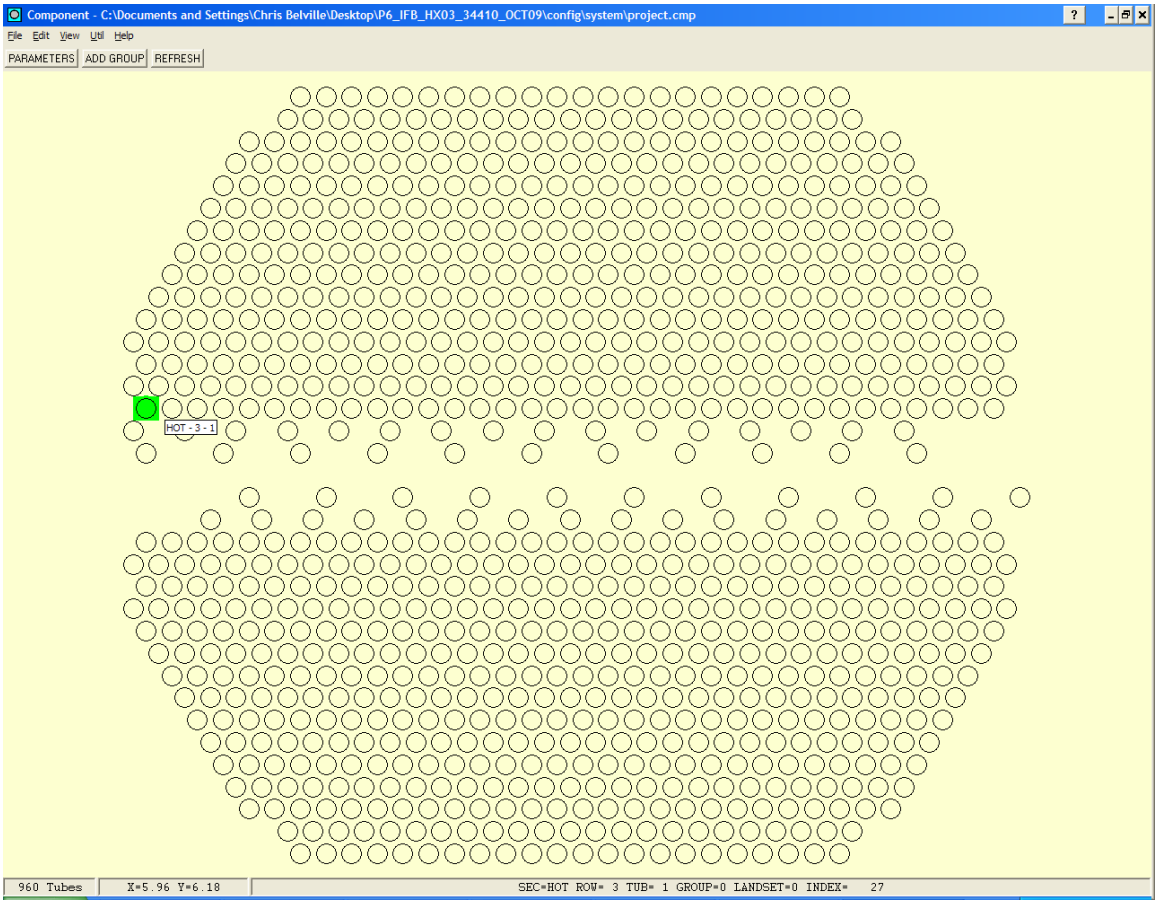
LAND#	NAME	TYPE	LEG	POS	ANGLE	FB INT	FIRST	LAST	REQ
1	HTE	TEH	INLET	0.000			1	17	Y
2	HTS	TSH	INLET	6.810			1	17	Y
3	H01	BAF	INLET	35.700			1	17	N
4	H02	BAF	INLET	64.680			1	17	N
5	H03	BAF	INLET	93.560			1	17	N
6	H04	BAF	INLET	122.440			1	17	N
7	H05	BAF	INLET	151.320			1	17	N
8	H06	BAF	INLET	180.200			1	17	N
9	H07	BAF	INLET	209.180			1	17	N
10	H08	BAF	INLET	238.000			1	17	N
11	H09	BAF	INLET	266.940			1	17	N
12	H10	BAF	INLET	295.820			1	17	N
13	TOP	VS	UBEND		0.000°		1	17	N
14	C10	BAF	OUTLET	295.820			1	17	N
15	C09	BAF	OUTLET	266.940			1	17	N
16	C08	BAF	OUTLET	238.000			1	17	N
17	C07	BAF	OUTLET	209.180			1	17	N
18	C06	BAF	OUTLET	180.200			1	17	N
19	C05	BAF	OUTLET	151.320			1	17	N
20	C04	BAF	OUTLET	122.440			1	17	N
21	C03	BAF	OUTLET	93.560			1	17	N
22	C02	BAF	OUTLET	64.680			1	17	N
23	C01	BAF	OUTLET	35.700			1	17	N
24	CTS	TSC	OUTLET	6.810			1	17	Y
25	CTE	TEC	OUTLET	0.000			1	17	Y

3. The **Lengths** tab must be completed for auto locate to work correctly. **FIRST** field indicates the first row of the component and **LAST** field indicates the last row. **BASE** should be the straight length of the tube. The **DELTA** field is typically 0. Be sure to stay consistent with units.

4. When editing group parameters, ensure the **Tube Pitch, Tube ID, and Tube OD** are in the same units as the landmark. The figure below shows sample parameters with units in centimeters.



5. Ensure that the tubesheet layout is accurate. This is important for the calculation of the ubend. For example, when the center point of row 3 is selected, the **Y** location (bottom left of figure below) is at approximately 6.18 cm. The value that the software uses to do the calculations can be found by going to the **Tubes** tab of the main **PARAMETERS** button. For this example, row 3 is 6.186 cm. This means that the radius for row 3 is 6.186 cm. If the desired radius is to be 7 cm for row 3, adjust the **Y Offset** value in the figure above to 0.814.



6. Save and exit once complete.
7. For auto locate to work correctly, it is critical that the pull speed be consistent. Below is a sample of an auto locate screen that is setup to locate tube ends by using the trained signals. If

the tube ends are cut off too early, training a tube end will accomplish nothing. For these type of tube ends, it is better to use the threshold based tube end locate. This can be done by changing **Loc Chan** from OFF to 1 (or any other channel).