CoreStar 3D Tube Mapping

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Purpose

This note explains how to use the new CoreStar 3D tube mapping software included in rev 9.1. This version is considered experimental. The purpose of the tools is to show the distribution of defects in three dimensions.

Please note: the purpose is NOT to create an accurate photo realistic display of the component and no attempt has been made to do so. Features such as drawing the tubes, bowl, or even thick supports, will obscure the defects and defeat the purpose of the software.

Getting Started

Boot DBMS and open the "**Sample 8 - CoreStar 3D**" project.

Click the **3D** button in the button bar.

Queries

Queries can now contain directives that determine how to display the results in the 3D map.

Queries must contain enough information to display in the 3D. This includes the tube ID, location and offset, and measurement pcnt or volts. The **QUERY** dialog now has a **Templates** menu option that will insert some examples.

If there are no directives, the results will be displayed using the color in the legend. The symbol is ignored.

Choose **Templates | 3D Pcnt** to see an example directive:

```
// 3D Query for pcnt
# TYPE_3D = PCNT
SELECT row, col, sec, loc_land, loc_off, loc_dist, from_land,
from_off, to_land, to_off, defect, pcnt, volts, meas_type,
phase, chan, outage
FROM report
WHERE NOT loc_land IS NULL
AND pcnt > 0.0
```

The first line is a comment. The second line is a directive that tells the 3D software automatically create 10 color coded 3D legend entries based on **PCNT**:

#	SYM	DESCRIPTION	COUNT
		3D Percent	
1		90% to 100%	77
2		80% to 89%	53
3		70% to 79%	57
4		60% to 69%	53
5		50% to 59%	72
6		40% to 49%	85
7		30% to 39%	129
8		20% to 29%	78
9		10% to 19%	9
10		0% to 9%	2
		TOTAL	615

The text "**3D Percent**" above uses the text in the **DESCRIPTION** column of the 2D legend table. It then takes all the report results returned by the query and puts them in the appropriate slot based on the percent field.

Without this feature, you would have to manually create 10 queries selecting the appropriate percent ranges.

Choose **Templates | 3D Volts** to see the directives for voltages.

```
# TYPE_3D = VOLTS
# COLOR_MAX_VAL = 100
// 3D Query for voltage
SELECT row, col, sec, loc_land, loc_off, loc_dist, from_land,
from_off, to_land, to_off, defect, pcnt, volts, meas_type,
phase, chan, outage
FROM report
WHERE NOT loc_land IS NULL
AND volts > 0.0 AND VOLTS < 40.0
```

 In addition to telling it the 3D type is **VOLTS**, which causes the color coding to be based on the report voltage instead of percent, you can also tell it the scale to use for the color coding (40 in this case). Percent calls have a natural scale of 0% to 100% , but for voltages you need to tell it what is considered "bad". For example, the above produces:

#	SYM	DESCRIPTION	COUNT
1		3D Volts	0
2		80.0 to 100…	0
3		60.0 to 80.0	0
4		40.0 to 60.0	0
5		20.0 to 40.0	167
6		0.0 to 20.0	1,319
7		TOTAL	1,486

where in this case very few are in the "bad" slots. If you omit the **# COLOR_MAX_VAL = 100** and execute, it produces:

#	SYM	DESCRIPTION	COUNT
1		3D Volts	0
2	🟥	31.7 to 39.6	34
3	🟧	23.8 to 31.7	74
4	🟨	15.9 to 23.8	188
5	🟩	7.9 to 15.9	252
6	🟦	0.0 to 7.9	938
7		TOTAL	1,486

where the color scale is automatically computed based on the max voltage of the query result. That is almost certainly not what is desired.

MakeComp

Some component files will need to be updated in order to use the 3D tools.

I) Landmarks

You must have at least one landmark. The system will automatically create a tubesheet display for each landmark in each landmark set. It does so by creating a list of tubes that see that landmark. It will automatically draw a tubesheet around the set of tubes.

A tube is assigned to the landmark if:

1. The tube uses that landmark set. Most components only have one landmark set and this will automatically be true.

2. The tube row is >= **FIRST** and <= **LAST** for that landmark in the **PARAMETERS** dialog **Landmarks** tab.

3. The leg of the section the tube is in is either the same as the landmark's leg or **NONE**.

To define a sections leg, a **LEG** field has been added to the section attributes table in the **PARAMETERS** dialog **Tube Labels** tab. The options are **INLET**, **OUTLET** or **NONE** (the default).

The first time an old .cmp file is loaded into 9.1, it will attempt to guess each sections leg. If the section name begins with "IN" or is "HOT", it will guess **INLET**. If it begins with "OUT" or is "COLD", it will guess **OUTLET**. If that fails, but all landmarks have the same leg, it will use that. Otherwise, it will make it **NONE** (so it will be used for any landmark). **To be safe, users should manually check and assign the section LEG field**.

Example 1: One Landmark set all INLET

All the tubes will be assigned to these landmarks according to criteria 2 and 3 above.

Example 2: One Landmark set with INLET and OUTLET in one big list

This is a common choice. But you must have at least two sections, one **INLET** and one **OUTLET** that will typically be mirror images of each other. This was not necessary for acquisition and analysis, but it is required in order to draw the 3D component.

Note: this common choice is what necessitated the **LEG** field in the above table. Otherwise, we could have just used the landmark set for a given tube.

Example 3: Two Landmark sets, one for INLET and another for OUTLET

Just assign the correct leg and landmark set to each section.

You can do any combination of the above.