

User Tip: Use the “Calculated Field”

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Would it help your work if the display/column options offered to display fields from other objects?

The screenshot shows the Model Explorer software interface. The main window displays a table of 'Line and Transformer Records' with columns for From Number, From Name, To Number, To Name, Circuit, Status, Branch Device Type, Xfrmr, R, X, B, and Lim. A 'Display/Column Options' dialog box is open, showing a list of available fields from various objects and a list of fields currently displayed in the table.

From Number	From Name	To Number	To Name	Circuit	Status	Branch Device Type	Xfrmr	R	X	B	Lim
1	10026 BACA	10000	12ST_TAP	1	Closed	Line	NO	0.02160	0.03160	0.00012	
2	10356 VALENTIA	10000	12ST_TAP	1	Closed	Line	NO	0.02390	0.03750	0.00012	

Display/Column Options Dialog:

- Available Fields:** Amps, Area, Bypassed, Calculated Field, Contingency Results, Control, Custom, D-FACTS, Difference Flows, EPC File, Fault Analysis, Geography, Geomagnetically Induced Current, Impedance, Island, Labels, Limit Monitoring, Line Drop/Reac Current Comp, Line Shunts, Multi-Section Line, etc.
- Show these fields in this order:** Number at From Bus, Name at From Bus, Number at To Bus, Name at To Bus, Circuit, Status, Topology\Branch Device Type, Transformer\Is a Transformer? (YES or NO), Impedance R (series resistance), Impedance X (series reactance), Impedance B (shunt charging), Limit Monitoring\MVA Limits\Limit A MVA, Limit Monitoring\MVA Limits\Limit B MVA, Limit Monitoring\MVA Limits\Limit C MVA.

Example: Count how many transformers connected to a bus

Calculated Field

Calculated Field Name: **Count of transformers**

Save Save As Rename Delete

Object Type: Branch

Branch calculations can be used with the following objects.

- 3W Transformer
- Area
- Branch
- Bus
- Bus TSSStats
- Contingency
- Contingency Element
- Contingency Element Block

Field: Find... Choose a Field

Use Absolute Value

Treat Blank Entries

- As zeros
- Ignore

Operation

- Minimum
- Maximum
- Sum
- Average
- Median
- Variance
- Standard Deviation
- Count

Objects to be included in the operation

- All
- Only objects that meet the filter below [Set Filter Same As...](#)

Select Filter Type: Branch

Pre-filter using Area/Zone/Owner Filters

Enabled (normally checked)

Logical Comparison: AND OR Not AND Not OR

Condition 1

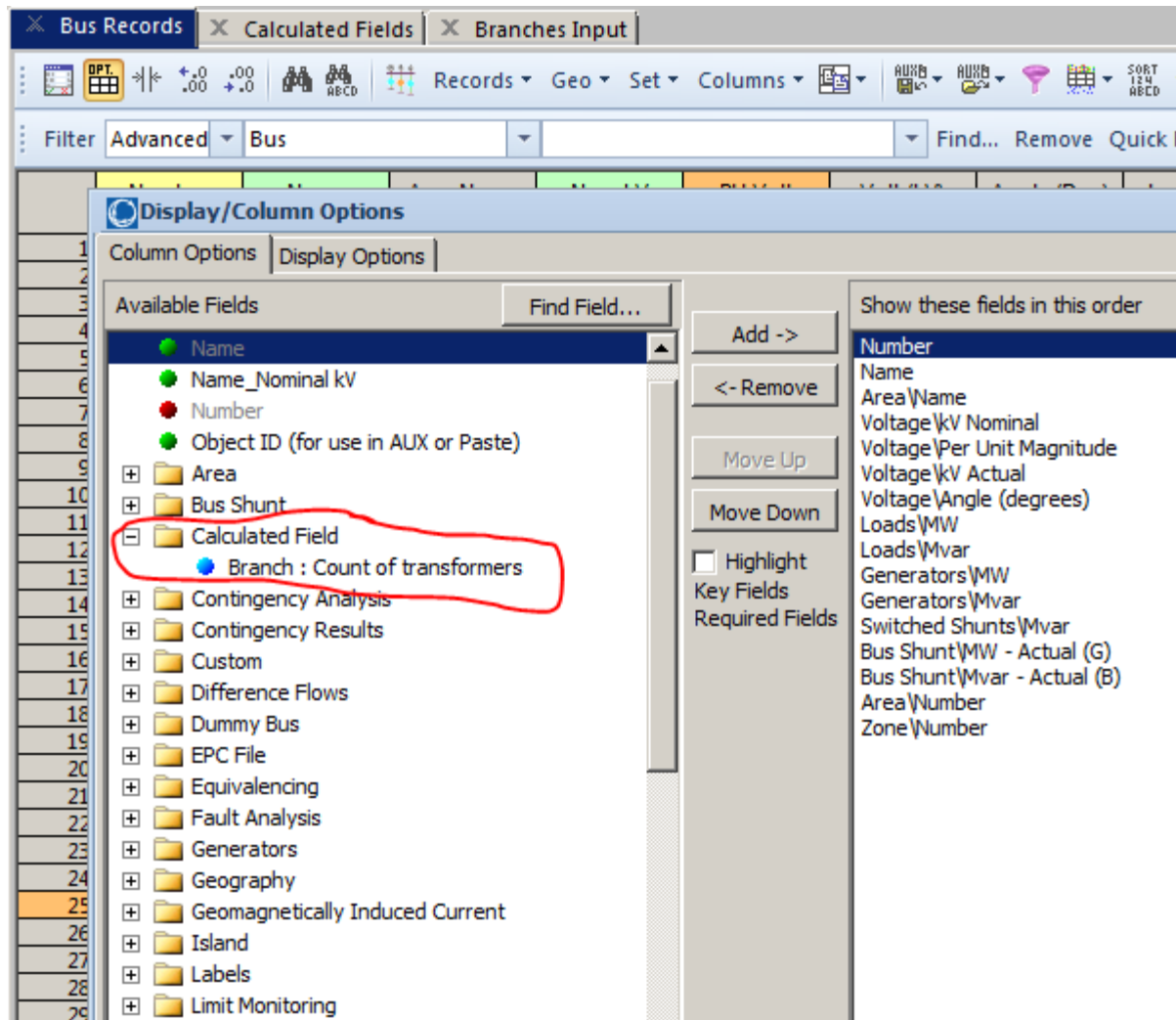
Find... Transformer\Is a Transformer? (YES c string starts with Yes Case Sens.

Use Another Filter

Add >> Delete ... Enable Field to Field Comparisons

OK Help Cancel

See how this calculated field for branches is available in the display/column options for buses



This calculated field now used in filter to find buses with more than 20 MW Pgen below 35kV (upper threshold for gen terminal voltage) connected to just one transformer

The screenshot shows the 'Advanced Filters for Bus' dialog box. At the top, 'Filter By' is set to 'Advanced' and 'Select Filter Type' is 'Bus'. The 'Filter Name' is 'One GSU for bus gen above 20 MW'. Below this are buttons for 'Save', 'Save As', 'Rename', 'Delete', 'Save Filter...', and 'View Filter Logic'. The main area contains three conditions, each with a 'Find...' dropdown, a comparison operator, a value, and an 'ABS' checkbox. Condition 1: 'Generators\MW' greater than or equal to 20. Condition 2: 'Calculated Field\Branch : Count of tra' equal to 1. Condition 3: 'Voltage\kV Nominal' less than 35. The 'Logical Comparison' is set to 'AND'. At the bottom are buttons for 'Add >>', 'Delete ...', 'Filter', 'Remove', 'Help', and 'Cancel'.

Note: the total Generators\MW field in bus case info display is like a “built-in” calculated field

Create branch filter to have the high side of a branch at BES voltage levels combined with the bus filter that restricts view to buses with one transformer connecting more than 20 MW Pgen

Advanced Filters for Branch

Filter By: **Advanced** | Select Filter Type: **Branch**

Filter Name: **BES GSU's** | Save Filter... | Save | Save As | Rename | Delete | View Filter Logic

Pre-filter using Area/Zone/Owner Filters | Logical Comparison: AND | OR | Not AND | Not OR

Enabled (normally checked)

Condition 1 | Condition 1
Find...: **Voltage Nominal kV (maximum)** | greater than | **101** | ABS
 Use Another Filter | Constant | Find

Condition 2 | Condition 2
Find...: **<_UseAnotherFilter** | meets filter | **<Bus>One GSU for bus gen above 20 MW** | Find
 Use Another Filter

Enable Field to Field Comparisons

Add >> | Delete ... | Filter | Remove | Help | Cancel

Here is the result of that filter

	From Number	From Name	From Nom kV	To Number	To Name	To Nom kV	Circuit	Status	Xfrmr
1	10266	REEVES_2	115.0	10263	REEVE_G3	13.8	1	Closed	YES
2	10292	SAN_JUAN	345.0	10318	SJUAN_G1	22.0	1	Closed	YES
3	10292	SAN_JUAN	345.0	10319	SJUAN_G2	24.0	1	Closed	YES
4	10292	SAN_JUAN	345.0	10320	SJUAN_G3	22.0	1	Closed	YES
5	10292	SAN_JUAN	345.0	10321	SJUAN_G4	22.0	1	Closed	YES
6	10393	LEF	345.0	10394	LEF_G1	18.0	1	Closed	YES
7	10393	LEF	345.0	10395	LEF_G2	18.0	1	Closed	YES
8	10393	LEF	345.0	10396	LEF_S1	18.0	1	Closed	YES
9	10485	AFTONS	13.8	11217	AFTON	345.0	1	Closed	YES
10	10486	AFTONG	18.0	11217	AFTON	345.0	1	Closed	YES
11	10899	VEF	115.0	10903	VEF	18.0	1	Closed	YES
12	11032	MPS	115.0	11227	LMS1	13.8	1	Closed	YES
13	11032	MPS	115.0	11228	LMS2	13.8	1	Closed	YES
14	11032	MPS	115.0	11232	LMS3	13.8	1	Closed	YES
15	11032	MPS	115.0	11233	LMS4	13.8	1	Closed	YES
16	11049	COPPER	115.0	11051	COPPER_G	13.8	1	Closed	YES
17	11110	NEWMAN	115.0	11114	NEWMANG3	13.8	1	Closed	YES
18	11110	NEWMAN	115.0	11116	NEWMN4G2	13.8	1	Closed	YES
19	11110	NEWMAN	115.0	11208	NEWMN5G1	13.8	1	Closed	YES
20	11110	NEWMAN	115.0	11209	NEWMN5G2	13.8	1	Closed	YES
21	11110	NEWMAN	115.0	11261	NEWMN5S1	13.8	1	Closed	YES
22	11131	RIO_GRAN	115.0	11135	RIOGD_G8	17.5	1	Closed	YES
23	11131	RIO_GRAN	115.0	11226	RIOGD_G9	13.8	1	Closed	YES
24	11289	NEWMAN_E	115.0	11229	NEWMN7G1	13.8	1	Closed	YES
25	11289	NEWMAN_E	115.0	11230	NEWMN7G2	13.8	1	Closed	YES
26	11289	NEWMAN_E	115.0	11231	NEWMN7S1	13.8	1	Closed	YES
27	11289	NEWMAN_E	115.0	11268	NEWMN6G1	13.8	1	Closed	YES
28	11289	NEWMAN_E	115.0	11269	NEWMN6G2	13.8	1	Closed	YES
29	11289	NEWMAN_E	115.0	11270	NEWMN6S1	13.8	1	Closed	YES
30	12057	PEGS	230.0	12058	PEGS1	17.6	1	Closed	YES
31	12093	PYRAMID	115.0	12094	PYRMDG1	13.8	1	Closed	YES
32	12093	PYRAMID	115.0	12095	PYRMDG2	13.8	1	Closed	YES
33	13309	TA-3	115.0	13311	TA-3-BL	13.8	1	Closed	YES
34	14000	CHOLLA	500.0	14901	CHOLLA2	22.0	1	Closed	YES

Create another Calculated Field to display the Pgen for that step up transformer (not just filter for it)

Calculated Field

Calculated Field Name: **Pgen on bus**

Save Save As Rename Delete

Object Type: **Bus**

Bus calculations can be used with the following objects:

- 3W Transformer
- Area
- Branch
- Bus
- Bus TSSStats
- Circuit Breaker
- Contingency
- Contingency Element

Field: **Generators\MW**

Use Absolute Value

Treat Blank Entries:

- As zeros
- Ignore

Operation:

- Minimum
- Maximum
- Sum
- Average
- Median
- Variance
- Standard Deviation
- Count

Objects to be included in the operation:

- All
- Only objects that meet the filter below **Set Filter Same As...**

Select Filter Type: **Bus**

Pre-filter using Area/Zone/Owner Filters

Enabled (normally checked)

Logical Comparison: AND OR Not AND Not OR

Condition 1:

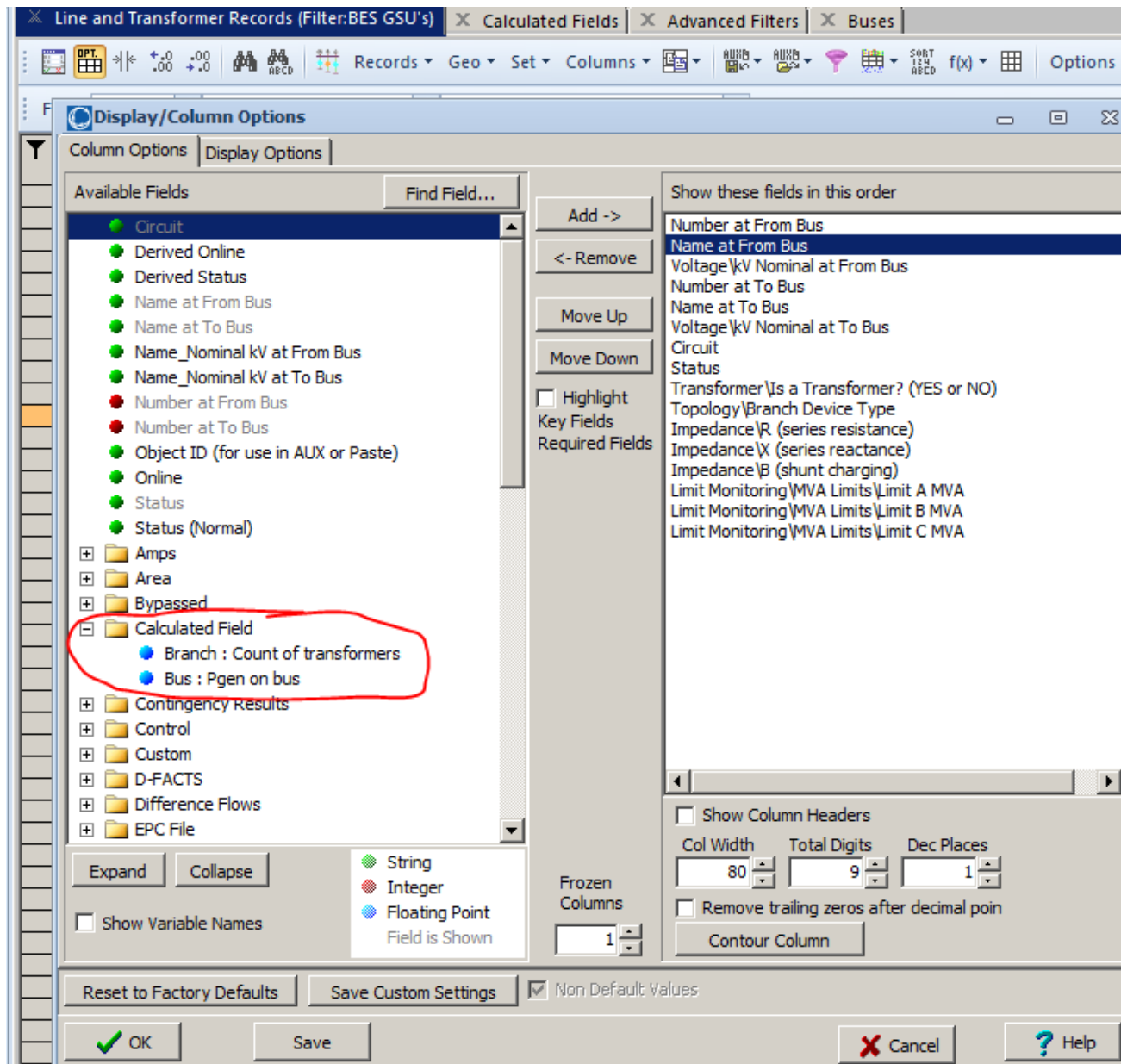
Find... **Choose a Field** **between** and ABS

Use Another Filter: **Constant** **Find** **Constant** **Find**

Add >> **Delete...** Enable Field to Field Comparisons

OK **Help** **Cancel**

The gen on the bus is now available to be displayed for branches



Here is what you will see

Line and Transformer Records (Filter: BES GSU's) | Calculated Fields | Advanced Filters | Buses

Records | Geo | Set | Columns | f(x) | Options

Filter: Advanced | Branch: BES GSU's | Find... Remove Quick Filter...

	Pgen on bus	From Number	From Name	From Nom kV	To Number	To Name	To Nom kV	Circuit	Status	Xfrmr
1	66.0	10266	REEVES_2	115.0	10263	REEVE_G3	13.8	1	Closed	YES
2	360.0	10292	SAN_JUAN	345.0	10318	SJUAN_G1	22.0	1	Closed	YES
3	350.0	10292	SAN_JUAN	345.0	10319	SJUAN_G2	24.0	1	Closed	YES
4	544.0	10292	SAN_JUAN	345.0	10320	SJUAN_G3	22.0	1	Closed	YES
5	494.0	10292	SAN_JUAN	345.0	10321	SJUAN_G4	22.0	1	Closed	YES
6	140.0	10393	LEF	345.0	10394	LEF_G1	18.0	1	Closed	YES
7	140.0	10393	LEF	345.0	10395	LEF_G2	18.0	1	Closed	YES
8	240.0	10393	LEF	345.0	10396	LEF_S1	18.0	1	Closed	YES
9	94.0	10485	AFTONS	13.8	11217	AFTON	345.0	1	Closed	YES
10	141.0	10486	AFTONG	18.0	11217	AFTON	345.0	1	Closed	YES
11	143.0	10899	VEF	115.0	10903	VEF	18.0	1	Closed	YES
12	79.0	11032	MPS	115.0	11227	LMS1	13.8	1	Closed	YES
13	79.0	11032	MPS	115.0	11228	LMS2	13.8	1	Closed	YES
14	79.0	11032	MPS	115.0	11232	LMS3	13.8	1	Closed	YES
15	79.0	11032	MPS	115.0	11233	LMS4	13.8	1	Closed	YES
16	49.0	11049	COPPER	115.0	11051	COPPER_G	13.8	1	Closed	YES
17	40.0	11110	NEWMAN	115.0	11114	NEWMANG3	13.8	1	Closed	YES
18	70.0	11110	NEWMAN	115.0	11116	NEWMN4G2	13.8	1	Closed	YES
19	66.0	11110	NEWMAN	115.0	11208	NEWMN5G1	13.8	1	Closed	YES
20	66.0	11110	NEWMAN	115.0	11209	NEWMN5G2	13.8	1	Closed	YES
21	141.0	11110	NEWMAN	115.0	11261	NEWMN5S1	13.8	1	Closed	YES
22	101.0	11131	RIO_GRAN	115.0	11135	RIOGD_G8	17.5	1	Closed	YES
23	79.0	11131	RIO_GRAN	115.0	11226	RIOGD_G9	13.8	1	Closed	YES
24	63.0	11289	NEWMAN_E	115.0	11229	NEWMN7G1	13.8	1	Closed	YES
25	63.0	11289	NEWMAN_E	115.0	11230	NEWMN7G2	13.8	1	Closed	YES
26	133.0	11289	NEWMAN_E	115.0	11231	NEWMN7S1	13.8	1	Closed	YES
27	63.0	11289	NEWMAN_E	115.0	11268	NEWMN6G1	13.8	1	Closed	YES
28	63.0	11289	NEWMAN_E	115.0	11269	NEWMN6G2	13.8	1	Closed	YES
29	133.0	11289	NEWMAN_E	115.0	11270	NEWMN6S1	13.8	1	Closed	YES
30	224.7	12057	PEGS	230.0	12058	PEGS1	17.6	1	Closed	YES
31	52.8	12093	PYRAMID	115.0	12094	PYRMDG1	13.8	1	Closed	YES
32	52.8	12093	PYRAMID	115.0	12095	PYRMDG2	13.8	1	Closed	YES
33	20.0	13309	TA-3	115.0	13311	TA-3-BL	13.8	1	Closed	YES
34	288.9	14000	CHOI1A	500.0	14901	CHOI1A2	22.0	1	Closed	YES

Questions ?