Introduction to PowerWorld Simulator:
Interface and Common Tools

I3: Model Explorer and Case Information Displays

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Model Explorer

• Encapsulates most Case Information Displays
• Provides means of navigating through almost all of the data in the model
• Available from a few places
  – Case Information Ribbon Tab
  – Tools Ribbon Tab
  – Quick Access Toolbar
Model Explorer

Recent Tabs

Explore Pane

Fields Pane

Object Types with no data grayed-out

Toolbar

Filterbar

Note: The options available on the Case Information right-click local menu are also available on the Case Information Toolbar directly above the display

Search Toolbar
Model Explorer: Explore Pane

- Explore Pane: The Explore Pane contains a hierarchical list of most of the objects contained in the power system model
  - Ten Primary Folders, with only Network and Aggregations folder expanded by Default
    - Network Folder
      - physical devices
    - Aggregations Folder
      - groupings of physical objects
Model Explorer: Explore Pane Tips

• Grayed out entries indicate that objects of that type are not presently defined in model
• To open a new separate Model Explorer Window
  – Hold down the CTRL key and then left-click on an entry in the Explore Pane
  – Or just click the button Open New Explorer
Model Explorer

• Fields Pane
  – Provides access to all the potential fields available to show on the active case information display
  – Similar to the Display/Column Options

• Recent Tabs
  – List of the most recently viewed case information displays
  – Easier to manage than multiple windows
  – Kind of like “tabbed browsing”
Model Explorer Options

- To access options, right-click on:
  - Explore Pane
  - Fields Pane
  - Recent Tabs
  - Toolbar
  - Searchbar
  - Filterbar
- Options available:
  - Specify location of Toolbar, Searchbar, and Filterbar
  - Specify location of the Fields Pane
  - Specify the number of Recent Tabs to maintain
  - Show Number of Objects
  - Insert User-Defined Case Information displays (discussed later)

Show Number of Objects
Fields Pane Location

- Toolbar (Top)
- Searchbar (Bottom)
- Filterbar (Top)
- Fields Pane Location
- Save Recent (10)
- Show Number of Objects
- Insert User-Defined Case Info
- Remove User-Defined Case Info

Tab with Explore

Left Side

Right Side

I3: Model Explorer and Case Info Displays © 2015 PowerWorld Corporation
• Very similar to the Model Explorer
• Contains case information displays for one-line display objects
• Provides means of navigating through data contained on a one-line in tabular form
• Available from the **Onelines** ribbon tab → **Active** ribbon group → **List Display** menu → **All Display Objects** option
Display Explorer

List only selected oneline objects  Same structure as Model Explorer

Save oneline to display auxiliary file
Case Information Displays

• Case Information Displays show the power system model data and results in tabular format

• Case information displays show information about
  – buses
  – generators
  – lines/transformers
  – loads
  – areas, zones
  – and everything else
Model Explorer: Generator Case Information Display
Case Information Displays

• Most case information displays can be opened from the Model Explorer
  – Case info displays also are integrated into many Simulator dialogs.
• Case Information Features
  – Find, Search For Text
  – Sorting
  – Filtering
  – Copy/Paste to/from a spreadsheet
  – Column Contouring
  – Column Metrics
  – Etc...
• User-Defined Case Info Displays
• Custom Case Info Display
  – Show different fields, change colors
  – Create entire custom workbooks showing specific information
Case Information Displays Options

- From the **Options** ribbon tab select **Simulator Options**...
- Go to **Case Information Displays** page

Use **Normal Headings** or **Variable Names**
See “Auxiliary File Data Sections” for description of Variable Names

- Default Font and Row Height for all case info displays
- Word Wrap long column headings
- Highlight the column headings of object key fields (yellow) and required fields for new records (green).
- Hints explain field when mouse floats over column heading.
- Options when using the Copy and Send local menu options

When saving an AUX file DATA Section, this delimiter is used...
Color Schemes

• Field Colors
  – Enterable Field
    • Fields that you can edit directly on the case info display
  – Toggleable Field
    • Double-click to change the value, or click the button to view and select from the available toggle choices
  – Special External Field
    • Fields that cannot be entered inside Simulator, but can via Paste from Excel or AUX file read
  – Field not presently used: data is not applicable, e.g. when a generator is open and all the fields appear gray
  – Normal and At or Exceeding Limit are self-explanatory

• Background Colors
  – Background and Heading Background are self-explanatory
  – Data Fill Background: when filling in data to be the same as other data
Default Case Information

Light Color Scheme

<table>
<thead>
<tr>
<th>Number of Bus</th>
<th>Name of Bus</th>
<th>ID</th>
<th>Status</th>
<th>Gen MW</th>
<th>Gen Mvar</th>
<th>Set Volt</th>
<th>AGC</th>
<th>AVR</th>
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I3: Model Explorer and Case Info Displays © 2015 PowerWorld Corporation
**Default Case Information**

**Dark Color Scheme**

<table>
<thead>
<tr>
<th>Heading Background</th>
<th>Heading Key Field</th>
<th>Heading Req’d Field</th>
<th>Toggleable Field</th>
<th>Enterable Field</th>
<th>At Limit Field</th>
<th>Field not presently used</th>
<th>Data Fill Background</th>
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</thead>
</table>

**Table Example**

<table>
<thead>
<tr>
<th>Number of Bus</th>
<th>Name of Bus</th>
<th>ID</th>
<th>Status</th>
<th>Gen MW</th>
<th>Gen Mvar</th>
<th>Set Volt</th>
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<th>AVR</th>
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<td>YES</td>
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<td>13.00</td>
</tr>
</tbody>
</table>
Case Information Toolbar

- Many common Case Information Display actions are available from the Case Information Toolbar
- By default, this toolbar is visible with all case information displays
Show Dialog

- Bring up any object’s dialog by choosing **Show Dialog**.
- Example:
  - Generator
Display/Column Options

Column Options

Gray text means the field is already shown.

Colored Dots represent the field type.

Hints automatically appear giving a description of the field.

Fields organized by folder.
Display/Column Options

Column Options

- Choose fields from the **Available Fields** list. Then left-click and drag into the **Show these fields in this order** list.

- Also can click the **Add →** or **← Remove** Buttons to modify the fields shown.

- Use a wildcard find for a particular field.

- Click **Move Up** and **Move Down** to change the order of the columns.

- Fields grayed out if already in display.

- Change attributes of the display columns. Also, use toolbar buttons.

- Number of frozen columns.
Display/Column Options

Display Options

Will disable the area/zone filtering for a single case info display. Also available via a toolbar button.

Define a custom filter

Also available via a toolbar button.

Change custom fonts and row heights

Auto resize all column widths. Also available via a toolbar button.

Reset all values to default

Notes: These values are not changed when resetting to the default values.
Alternative Display/Column Options

Model Explorer: Fields Pane

- Fields Pane: Directly modify the columns shown by dragging from the Fields Pane onto the case information display
  - Location of new field is highlighted by a **red** line
- Also, CTRL Left-Click at the top of columns to reorder them on any case information display
  - Column being moved is highlighted by **red** box
  - Location being moved to is highlighted by a **red** line
Find...

- Use wildcard searches to find an object

Brings up a dialog list of all objects that meet the wildcard string

Wildcard string. Use:
* - several unknown characters
? - a single unknown character

A list of all the objects

Sort List by name or number
Filter the List
Example Wildcard Searches

• On both the Find and Search for Text Dialogs, you can use wildcard searching
  – * several unknown characters
  – ? a single unknown character
• * Examples
  – *pw* would find “abcpw123”, “pw123”, and “abcpw”
  – pw* would only find “pw123”
  – *pw would only find “abcpw”
• ? Examples
  – ?pw* would find “apw123” and “apw”
  – ?pw* would NOT find “abcpw123”
Search for Text...

- Search through the text shown on the case information display for a particular string.
- Feature can also be accessed directly on the Search Toolbar at the bottom of the Model Explorer.

Enter Search String
Search by columns or rows
Search records filtered out
Search fields not displayed

Match upper/lower case letters
Only search if entire cell matches
Search for Text Options

• Search Ignore Filters
  – Choose this option to search through all records of the object type shown on the case information display regardless of the present filtering applied
  – If the text is found outside of the presently shown objects, then you will be prompted to remove filtering

• Search All Fields
  – Choose this option to search through all fields of the object type shown on the case information display regardless of the presently shown fields
  – If the text is found in a field not presently shown, then you will be prompted to show the column
Records Menu

• Contains a list of actions related to the specific kinds of records displayed in the case information display

• Common choices available here
  – Insert and Delete: to insert and delete objects
  – Bus View and Substation View
  – Area/Zone/Owner Filters
  – Pan to Object on Oneline – choose to pan to a display object that represents the active row

• Typical other choices
  – Special choices for each particular record type
  – Automatically creating objects from the selection
Define Expression

- To open the Custom Expression Dialog, select the f(x) toolbar menu and choose Define Expression...
- Then click New to make a new expression
Creating a Custom Expression

Specify the fields used in the expression

Write the expression as a function of x1, x2, ...

Choose Add Column... as a quick way to add the column to the Case Info Display
Operators Available in Custom Expressions

• Details available in Help files

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<th>CSCH</th>
<th>LOG</th>
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Define String Expression

- Select the f(x) toolbar menu, choose Define String Expression..., and click New
- Can concatenate strings with the + operator
- Convert numeric fields to strings with Str function
- Example: Area Name and Number
Geo Menu

- Geo Menu provides access to options related to the automatic creation of Geographic Data Views.
  - There must be latitude/longitude information populated in either the bus records or the substation records for this to work.
  - This will be discussed more in the Advanced Visualization Section later in the training.
Set Menu

- Set Menu contains options for changing values in the presently selected column
  - Toggle All YES, NO, Closed, Open, etc...
  - Set All Value to...
    - Choose this option to set all values in the active column to a particular value. A dialog will appear allowing you to specify the value to which to set the values.
  - Set All Values to Field...
    - Choose this option to set all values in the active column to the values in another column.
      - For example, you may change the voltage set-point of a generator to be equal to the terminal voltage of the generator. A dialog will appear asking you to choose the field.
  - Actions only apply to objects presently being shown on the display – Filtering is important
Set Values to Field... Another Way Enter Data from Another Field

• When typing, append the @ symbol to copy data from another field
• Fields must be identified with Variable Names (See Auxiliary File Format: DATA Section topic for description of Variable Names)
• Example: Type @BusPUVolt into the generator setpoint voltage and it will change the setpoint to the terminal voltage.
• This also works in auxiliary files or when pasting from Excel
  – Note: When entering in Excel, you may need to add a single quote (‘) before the @ symbol
Columns Menu

- Several options generally available
  - **Select Columns** and **Select Rows**
  - **Get Column Metrics**
    - Get statistical information about the data shown
  - **Contour Columns**
    - Color the background of the cells in the column
  - **Plot Columns**
    - Show a plot of the data in the columns
Get Column Metrics

• Available under the **Columns** toolbar menu
• Choose to get the statistical information about the column you click (only for those values that are presently displayed)
  • Sum
  • Average
  • Variance
  • Standard Deviation
  • Maximum
  • Minimum
  • Total Items
  • Total Non-Zero Items
Contour Column

- To open the Contour Column Dialog, select the Columns toolbar menu and choose Contour Column...

Column being contoured

Choose your color map

Choose the fields to use for the contouring (normally the same as the column being contoured)

Choose how the values map to colors

Options regarding the Color Key
Example Display with Contoured Columns
Plot Columns

- Choose the Plot Columns option to allow yourself to plot any column that is presently shown on the case information display.
- An example using generator Maximum MW outputs is shown below.

Set options

Click Plot to update plots
Area/Zone/Owner Filtering

- Area/Zone/Owner Filtering is a GLOBAL setting
  - They apply to all case information displays
- Use Area/Zone/Owner Filtering to limit what is shown in Case Information Displays to only those elements whose:
  - Area is set to be shown  
    AND
  - Zone is set to be shown  
    AND
  - Owner is set to be shown
### Area/Zone/Owner Filters

Toggle the Shown field

<table>
<thead>
<tr>
<th>Areas</th>
<th>Zones</th>
<th>Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>LGE</td>
<td>YES</td>
</tr>
<tr>
<td>5</td>
<td>KU</td>
<td>YES</td>
</tr>
<tr>
<td>6</td>
<td>BREC</td>
<td>YES</td>
</tr>
<tr>
<td>7</td>
<td>IPL</td>
<td>YES</td>
</tr>
<tr>
<td>8</td>
<td>NIPS</td>
<td>YES</td>
</tr>
<tr>
<td>9</td>
<td>CP</td>
<td>YES</td>
</tr>
<tr>
<td>10</td>
<td>DEPC</td>
<td>YES</td>
</tr>
<tr>
<td>11</td>
<td>EAST EQ</td>
<td>YES</td>
</tr>
<tr>
<td>12</td>
<td>TVA</td>
<td>YES</td>
</tr>
<tr>
<td>13</td>
<td>DOE</td>
<td>YES</td>
</tr>
<tr>
<td>14</td>
<td>SERC EQ</td>
<td>NO</td>
</tr>
<tr>
<td>15</td>
<td>EMO</td>
<td>NO</td>
</tr>
<tr>
<td>16</td>
<td>IP</td>
<td>NO</td>
</tr>
<tr>
<td>17</td>
<td>CIPS</td>
<td>YES</td>
</tr>
</tbody>
</table>
Advanced Filtering

• Click on the Advanced Filter toolbar button and choose Advanced Filter…

• When you open this dialog, the default is to see filters that have been defined for the type of object you are trying to filter (e.g. Bus, Generator, Interface, etc…).

• Note: When choosing the field to filter against, use the Find… button
  – Many locations in Simulator have a drop-down list of fields to choose from
  – Lists can have 100s of entries and are difficult to navigate
  – Use the Find… button to make it easier
Advanced Filter Dialog

Filter By will be discussed shortly (Advanced or Device)

Type of object being filtered

Logical Comparator

Conditions

Use the Find... buttons

Click to delete a condition
Advanced Filtering

• Some objects allow the use of filters defined for related objects
  – Change **Select Filter Type** to select/define filters for related objects
  – Example: Use bus filter for nominal voltages greater than 138 kV to filter generators

• No Maximum Amount of Conditions
  – Choose the field, then the comparator, then the values to compare the field to.
  – Fields are the same as those available for Case Info

• You can optionally “pre-filter” using the Area/Zone/Owner Filters
Advanced Filter

• Logical Comparison specifies the filter logic.
  – Comparison applies across ALL conditions
    • AND – filter is met if ALL conditions are met
    • OR – filter is met if ANY condition is met
    • NOT AND – filter is NOT met if and only if ALL conditions are met
    • NOT OR – filter is NOT met if and only if ANY condition is met

• Other advanced options
  – Absolute value (ABS) compare for numeric conditions
  – Case Sensitive compare for string conditions
  – Field-to-field comparisons
  – Using another filter as a filter condition

• An Advanced Filter Toolbar is also available for quickly selecting and applying filters
Field-To-Field Comparisons

- Users have the option to include Field-To-Field comparisons

Click the **Find** Button to choose another field to compare to instead of a constant value.

Check the box for **Enable Field to Field Comparisons**
Using a Filter as a Condition

\[ X \ AND \ (Y \ OR \ Z) \]

- As described, filters are very flexible, however you cannot create the comparison
  - \[ X \ and \ (Y \ or \ Z) \]
- In order to do this you must first create a filter that represents “Y or Z”
  \[ \text{Result} = X \ and \ (Y \ or \ Z) \]
- Then create a second filter which uses this filter as a condition
  - Check the box \textbf{Use Another Filter} under the list of fields for the condition
  - This changes the dialog to have choices of meets filter or not meets filter
  \[ \text{B} = (Y \ or \ Z) \]
  \[ \text{Result} = X \ and \ B \]
Using a Filter as a Condition

X AND (Y OR Z)

- Note: you must be careful to avoid circular references
Advanced Filtering: Across Object Types

• Use advanced filters across object types
  – For example: define a Bus filter and then use this bus filter on a generator, load, or switched shunt object
  – If the object being filtered contains more than one of the filter object type, then OR is assumed.
    • If a bus object uses an area filter, the bus meets the filter if the area of the bus meets the filter
    • If an area object uses a bus filter, the area meets the filter if ANY single bus in the area meets the filter
Quick Filter

- Filters may also be quickly created and applied without saving the filter name
- Choose **Quick Filter...** from the **Advanced Filter dropdown** or **Filterbar**
Quick Filter

- Quick Filters are created just like Advanced Filters

- **Condition 1** will default to the field and value of the presently selected cell in the **Case Info Display**
  - Subsequent selection of **Quick Filter** with different cell selections can be used to add conditions

- If not saved, Quick Filters are lost when another Advanced or Quick Filter is created or applied
  - To save a Quick Filter, open the **Advanced Filter Dialog** while the Quick Filter is applied, then click **Save** or **Save As**
Case Information Toolbar: Filters Menu

- Provides access to the old **Advanced Filter**... button and **Area/Zone/Owner Filters**
- Also provides submenu access to advanced filters defined for related object types
Advanced Filtering: Device Filtering

- **Filter By** = Device
- Directly use one of the power system model objects as a filter
- Relationship between the object types will determine filter action
  - Use an injection group as a device filter on a list of generators
  - Result will be to only show the generators in the injection group
Case Information Filterbar

- Shown Directly above the case information display on the Model Explorer
  - Not shown by default in other locations
  - To show, right-click on case info toolbar to choose Filterbar>Top
- **Filter By** and **Filter Type** → same as drop-down on filter dialog
- **List of Filters** or **List of Devices**
  - For Advanced Filters, this will be a list of presently defined filters
  - For Device Filters, this will be a list of the devices of the type
  - If more than 1,000 entries in drop-down, then drop-down will behave like clicking the Find.. Button instead
- **Find...** button → will open the Advanced Filter dialog
- **Remove** button → will remove filtering from the case info
Filterbar Example: Device Filtering

- Use Injection Group as a Device Filter on a list of buses
  - Get a list of the terminal buses for all generator, loads, and shunts in the injection group
Filterbar Example: Advanced Filtering

- Use the advanced filter for a branch on a list of buses
  - Get a list of terminal buses of the branches which meet the advanced filter
Simple Sorting

- To sort a column, left-click on the column heading. Click again to sort in the opposite direction.
- SHIFT + Left-Click will sort by Absolute Value.

Sorted Descending by Gen MW

Note: Arrow showing sort direction

Absolute Value Sort

Click here to remove sorting
Advanced Sorting

- Click on the **Advanced Sort** toolbar button to open the Advanced Sorting Dialog

Check to Limit the Fields available to sort by to those which are shown on the list display

Click to delete condition
Advanced Sorting

• Choose the sort order you desire
• Can be either ascending or descending
• No Maximum Amount of sort conditions
• Other advanced options
  – Absolute value (ABS) compare for numeric conditions
  – Case Sensitive compare for string conditions
Save As

• Save As
  – Auxiliary File...
    • This will save **ALL** information shown in the present case information display as a DATA section in an auxiliary file
    • **ALL** fields being displayed will be saved
  – Auxiliary File (only selected records)...
    • Same as previous, but
    • **Only Selected** records will be saved
    • Again **ALL** fields being displayed will be saved
  – Auxiliary File (only selected records/columns)
    • Same as previous, but
    • **Only Selected** records will be saved
    • **Only Selected** fields will be saved
Save As

- **Save As**
  - CSV (Comma delimited)...
    - This will save *ALL* information shown in the present case information display in a comma-separate value (CSV) text file
    - The first line of text will be the object type
    - The second line of text will be the list of the displayed fields
    - The rest will be values of all displayed fields for all objects shown, separated by commas
  - CSV (only selected records/columns)...
    - Same as previous but *Only Selected* Records and columns will be saved
  - HTML...
    - This will save the case info as an HTML file
  - Other formats (depending on the display)
    - Some case information displays have other formats available. Often these are formats from older versions of Simulator.
Load

• Load
  – Auxiliary File (any data)...
    • Will load all DATA sections from an auxiliary
  – Auxiliary File (only specific data)...
    • Will load only specific kinds of data from an auxiliary file.
  – Other formats (depending on the display)
    • Some case information displays have other formats available. Often these are formats from older versions of Simulator.
Copying from and Pasting to Case Information Displays

• There are five Copy/Send options
  – Copy All: copy all contents of display
  – Copy Selection: copy selection
  – Send All to Excel: send all contents directly to excel (this will open a session of Excel and populate a worksheet)
  – Send Selection to Excel: send only selection
  – Copy/Send Special
Copy/Send Special

- Provides the same options as the other four Copy/Send options
- Allows you to specify whether to use the column headings from the case info display or variable names from the DATA section of the auxiliary file format.
- Allows you to specify whether to copy the two informational rows (described next).
- Send/Copy the transpose of the data will send/copy the column information to rows and the row information to columns.
Copy/Send to Excel

Dialog Occurs only if session of Excel is already running.

Cell A1 describes the kind of data

Row 2 describes which fields are being pasted

For Loads, Number and ID are the key fields

Select existing or new workbook and worksheet for sending data

Copy/Send to Excel
Description of Data: (Cell A1)

• The first entry in Cell A1 (highlighted) is a description of the data.
  – It is VERY important
  – Keep this description and DO NOT modify
  – When pasting back into the case information display, Simulator reads this line to find what kind of data is being pasted
  – Besides the string that is written by Simulator, you may also use the *Object Name* of the type of data being pasted. See DATA sections of the auxiliary file format for more information
Description of Fields: (Second Row in Table)

• The second row (highlighted) provides a list of the fields in the data.
  – Also VERY important
  – When pasting back into Simulator, the second row is used to determine what kind of fields are being pasted
  – Note that if Simulator does not recognize a field heading, it ignores this field in the paste
  – You may alternatively use the *Variable Names* from the DATA section of the auxiliary format
Data Record Key Fields

• Each kind of data record has a few columns that serve as *key fields* for Simulator.
  – Buses: *Number*
  – Lines: *From Number, To Number, and Circuit*
  – Loads: *Number and ID*

• If you want to paste data back into Simulator you MUST keep these columns intact.

• You can get a list of the key fields by choosing Export Case Object Fields → Text File from the Window ribbon tab.
  – The key fields will be denoted in this output with asterisks (*1*, *2*, and *3*)
Secondary Key Fields

• There are also secondary key fields
  – Often represent a combination of Name/Nominal kV for bus-related objects
  – The secondary key fields will be denoted in this output with asterisks (*A*, *B*, and *C*)

• When pasting into Simulator, we first look to see if the key fields are available. If they are not, then we look for the secondary key fields and use them instead.
Labels

- Unique identifier for an object of a particular type
- Refer to equipment in the model in a way unique to your organization
- Likely to change less frequently than bus numbers
- Can be used for pasting and updating
  - Label (for use in input from AUX or Paste)
Use the Spreadsheet

• You can now utilize the power of your spreadsheet in any manner you wish. Just make sure the final format of the spreadsheet meets the requirements of having the two header rows EXACTLY correct and keep the columns which represent the key.

• Outside of these requirements, you can delete and modify the columns and rows of the spreadsheet however you wish.

• For example, you can change the reactive power component of all the loads and then read them back in to see how the voltages are affected.
Select the Spreadsheet

• When you have completed your spreadsheet use and want to paste back into Simulator:
  – Select the entire spreadsheet (the easiest way to do this is to click on the top left square between the Row A and Column 1 headers).
  – Select Copy.

• You can alternatively select only part of the spreadsheet as long as you capture all of the required format.
Pasting into Simulator

• Go back to Simulator, click on the **Copy, Paste, and Send** toolbar menu and choose **Paste**
  – Note: if the clipboard format is not correct, then Simulator will disable the Paste option

• A few last notes: you can only paste values into the case information displays if the values are enterable. This means they will be displayed as **blue** (by default).
Pasting NEW objects

- You can also paste in new objects from the spreadsheet.
- Be careful. You must provide all required data regarding the object.
- For instance, if you create a bus you should include an area number and a zone number.
- Required Fields can be highlighted in green by using the **Highlight Key/Required** fields options:
  - In the Display/Column Options
  - In the heading caption of the case info display
Redundant Data

- Also, be careful about pasting redundant data. For example, in the Bus Records both voltage in *per unit* and voltage in *kV* are enterable, but they specify the same information.
- Make sure you only copy ONE of these columns into Simulator. Otherwise you may not get what you expect. Simulator will paste the information in twice, and whatever value was 2nd will show up
Example Redundant Data

• Load Records represent an example of redundant data. The MW value is a function of the S MW, I MW and Z MW values
  - \[ MW = S_{MW} + I_{MW} \times V_{pu} + Z_{MW} \times V_{pu}^2 \]
• Thus if you do the following nothing happens because the S MW, I MW and Z MW columns get pasted in separately
  - Send All the display out to Excel
  - Modify the MW columns
  - Copy All and then paste back into Simulator
Case Information Displays: Options Menu

- Highlight Key Fields
- Headings → Normal or Variable Names
  - Variable Names makes column headings show variable names that would appear in AUX files
- Show Grid Lines
  - Check to show grid lines between cells in the case information display
- Show Header Hints
  - When hovering mouse over the column heading, a hint appears describing the column
- Word Wrap Headings
- Default Row Height
- Highlight Row if Selected Field = YES
- Zoom Percentage → Change zoom on the active case information
- Remove Trailing Zeros → Check to not show trailing zeros
Case Information Displays: Options Menu

- Highlight Key Fields (and Required Fields)
- Heading: Variable Names
- Word Wrap Headings
- Show Header Hints
- Remove Trailing Zeros
Case Information Display

Local Menu

- Local menu can be opened by right-clicking on a case information display
- Most of the options and actions available are identical to the options available on the Case Information Toolbar
- Options on Local Menu not available on the Case Information Toolbar
  - Help
  - Form Control
    - Provides options for printing and showing the case information display
Case Information Display
Local Menu
Custom Field Descriptions: Custom Floats, Integers, and Strings

• In early versions of Simulator, the following were allowed with each object
  – 5 custom floating points
  – 5 custom strings
  – You could not give these fields their own name

• Simulator 13 and later now allows
  – Any number of floating points
  – Any number of strings
  – Any number of integers
  – You can now give these fields names

• By default, Simulator is configured to allow
  2 custom floats, 2 integers, and 2 strings
  – Use Custom Field Descriptions to add more
Custom Field Descriptions: Custom Floats, Integers, and String

- Access these definitions on the Model Explorer Explore Pane under Case Information and Auxiliary/Custom Field Descriptions.

Default object types are always listed.

You can change the default number of fields directly here.
Custom Field Descriptions: Custom Floats, Integers, and String

- Right-Click and choose Insert
  - Choose the Object Type
  - Choose the Field Type
  - Choose the Number of Type
  - Define Field Captions
  - Define Header Captions

Folder View of Available Bus Fields Becomes
Integration of Custom Fields into User Interface Dialogs

- Custom tab is available on information dialogs throughout
  - Access to Custom Fields, Memo, and Selected Field
User-Defined Case Information Displays

• What’s the motivation?
  – Normally, customizing the built-in case information displays is sufficient
  – However, it may be convenient to define one set of generator fields for studying voltage regulation problems and another set for MW-related studies

• User-Defined Case Information Displays provide this ability
  – Allow customization of columns, filters, sorting, etc... without requiring repeated customizations
  – Note: on user-defined case information displays, the various record-specific actions which often appear in the Records drop-down are not available
User-Defined Case Info Management

- Right-Click on Explore Pane to create User-Defined Case Infos
  - They show up under the **User-Defined** Folder of the Explore Pane
  - Customization is the same as other case info
  - Navigate to **Case Information and Auxiliary\User-Defined Case Info Displays** to save customization settings to AUX file
- User-Defined Case Infos can be made to display any object type, including various settings and options
Custom Case Info Displays

- Create spreadsheet-like case info displays with any type of information of interest
- Select **Custom Case Information** from the Model Explorer
Custom Case Info Displays

- Sheets may be added, renamed, or deleted
- Four Modes
  - Define Fields/String
  - Change Field Data
  - Show Fields Primary
  - Show Fields Secondary
- Double-click in a cell to add data from case (while in any mode except Change Field Data)
Define Fields/String Mode

- **Plain Text Cell**
  - type any text or numbers in a blank cell to create a plain text cell
  - Text color matches Enterable Field Color (blue by default)

- **Model Field Cell**
  - Double-click on cell to open a dialog to define the model field
Change Field Data Mode

- Blank Cell and Plain Text Cell
  - May not be edited
  - Text color matches Field Not Presently Used Color (gray by default)
- Model Field Cell: behaves according to the field it represents (read-only, enterable, toggleable)
Show Fields Primary Mode

• Blank Cell and Plain Text Cell
  – Behave the same as in Define Fields/Strings Mode
• Model Field Cell
  – display string representation of Model Field link
Show Fields Secondary Mode

- Similar to the Show Fields Primary Mode, except Model Field string uses secondary field representation (e.g. Name and Nom_kV for bus)
Custom Case Info Display

- **Local Menu**
  - Contains “spreadsheet-like” commands for manipulating cells and workbooks

- **Custom Case Info Menu**
  - Switch mode or change appearance of display