# Introduction to PowerWorld Simulator: Interface and Common Tools

## I12: Auxiliary File Format: SCRIPT Section

2001 South First Street
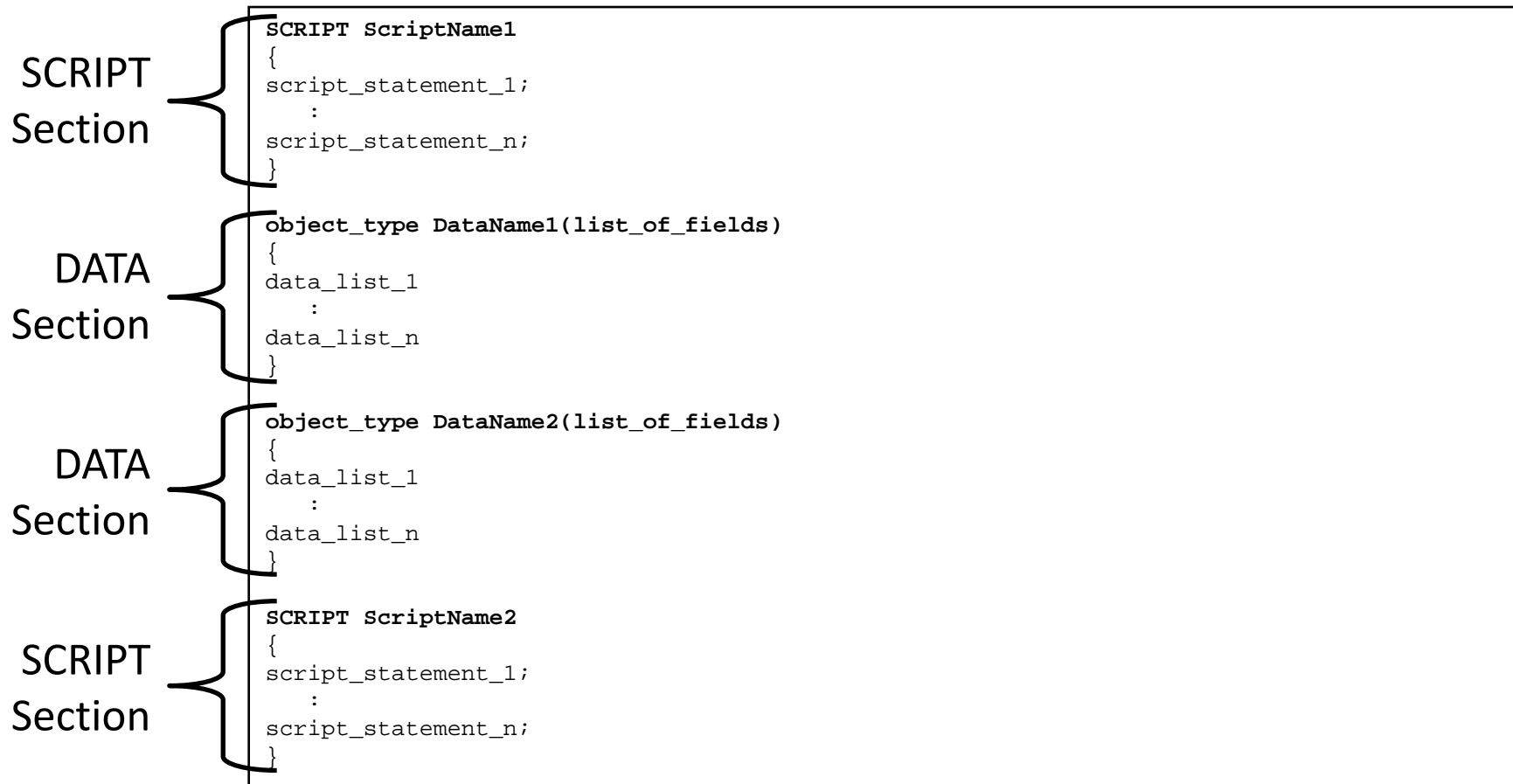Champaign, Illinois  61820
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# Auxiliary File Format Overview

- Has two types of "Sections"
  - There is no limit to the number of sections in a file

SCRIPT Section
```
SCRIPT ScriptName1
{
script_statement_1;
    :
script_statement_n;
}
```

DATA Section
```
object_type DataName1(list_of_fields)
{
data_list_1
    :
data_list_n
}
```

DATA Section
```
object_type DataName2(list_of_fields)
{
data_list_1
    :
data_list_n
}
```

SCRIPT Section
```
SCRIPT ScriptName2
{
script_statement_1;
    :
script_statement_n;
}
```

# Auxiliary File DATA Sections

This was discussed in a previous section

- Start with a valid Object_Type string
- An optional data name may follow
  - For use with the LoadData Action
- Following this is a list of fields enclosed in parenthesis
  - **(list_of_fields)**

```
object_type DataName1(list_of_fields)
{
data_list_1
    :
data_list_n
}
```

# Auxiliary File
# SCRIPT Sections

- Start with the word SCRIPT
- An optional script name may follow
  - For use with the LoadScript Action
- Then a block of script actions follow enclosed in curly braces { }
- Each script statement must end in a semicolon ;
- All the script actions allowed will be covered in a later set of slides.

```
SCRIPT ScriptName1
{
script_statement_1;
    :
script_statement_n;
}
```

# Script Command Execution Dialog

- To open go to the **Tools** or **Add Ons** ribbon tab and select **Script**
- Manually enter script commands
  - Useful for testing scripts
- Load auxiliary files
  - Validates and applies
- Validate auxiliary files
  - Receive messages in the message log if anything is incorrect in an auxiliary file before applying
- Quick Aux
  - Set up list of auxiliary files that are used frequently
  - Quickly reference a selected auxiliary file
  - Apply group of auxiliary files in a specified order

# Script Command Execution Dialog

Load or validate auxiliary files

Get list of fields for each object type

Define list of frequently used auxiliary files for easy access



Directly enter script commands here. Uncheck **Execute on ENTER key** to enter multiple commands.
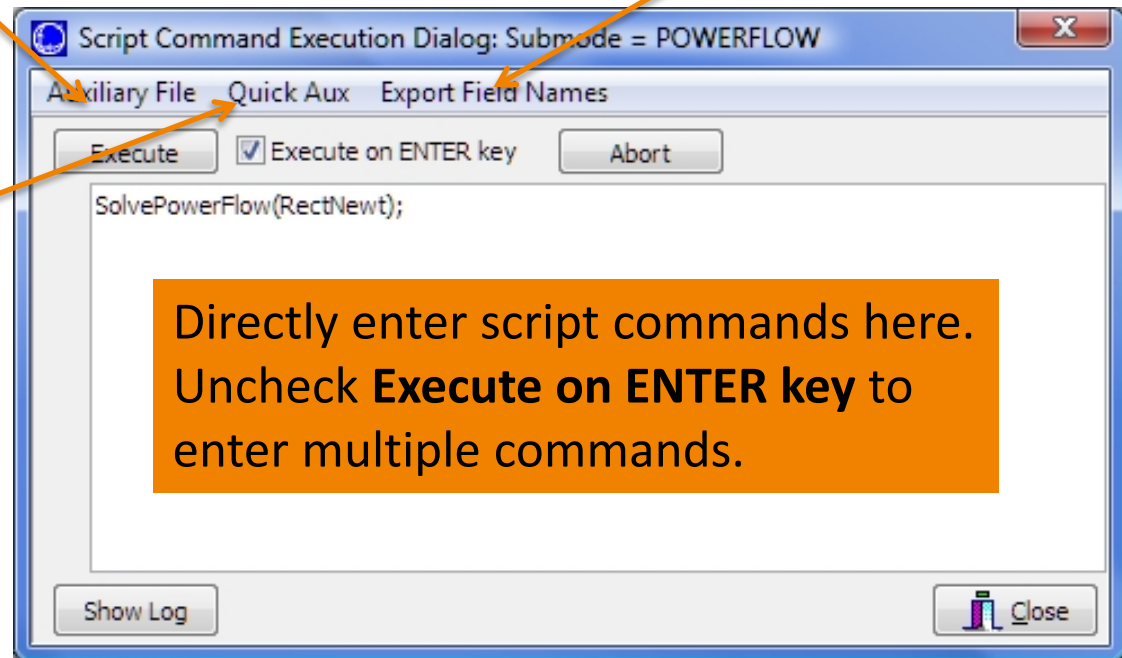
# Edit and Run Mode

- The Simulator user-interface has an Edit Mode and a Run Mode
  - Edit Mode: for making changes to system topology (e.g. adding a bus, deleting a transmission line, creating an Equivalent case)
  - Run Mode: for performing calculations and analysis (e.g. solve power flow, run contingency analysis, calculate available transfer capability)
- These modes must also be obeyed in scripting; use *EnterMode* script action to change modes
- A non-exhaustive list of script actions follows
- These references contain a complete list of script commands and detailed information on the use of each:
  - Simulator program help
  - Window ribbon → **Auxiliary File Format**
  - http://www.powerworld.com – Go to Online Support → AUX File Format

# Types of Script Actions

- **General Actions**
  - Files, data, Case or Oneline actions

- **Edit Mode Actions**
  - Actions editing the current case

- **Run Mode Actions**
  - Solution related actions, or study type specific actions

- **AXD Script Actions**
  - Script actions relating to display objects

# Auxiliary Files and Difference Cases

- The Difference Case Tool may be used to build an auxiliary file that shows the topology difference between 2 cases

- Uses

  – Document topology changes in cases

  – Modify a case with Simulator GUI and capture changes in auxiliary file; the auxiliary file can be run on a different copy of the Base Case to produce the Changed Case

# Auxiliary Files and Difference Cases

- Example
  - Open "Case A" and choose **Tools ➔ Difference Flows ➔ Set Present as Base**
  - Open "Case B" and choose **Tools ➔ Difference Flows ➔ Present Topological Differences From Base…**

# Use Difference Cases

- First, save new items (*Only New Elements*) to auxiliary file

- Then save removed items (*Only Removed Elements*) items: append to the same auxiliary file if desired

- Add a script statement at the beginning of the newly created file to switch to edit mode so that objects may be added and deleted

# Example

- Open B7FLAT.pwb
- Set Present Case as Base Case
- Add new Bus 8, new Gen at Bus 8, and new Branches connecting Bus 8 to Bus 1 and Bus 6
- Remove Branch between Bus 2 and Bus 6
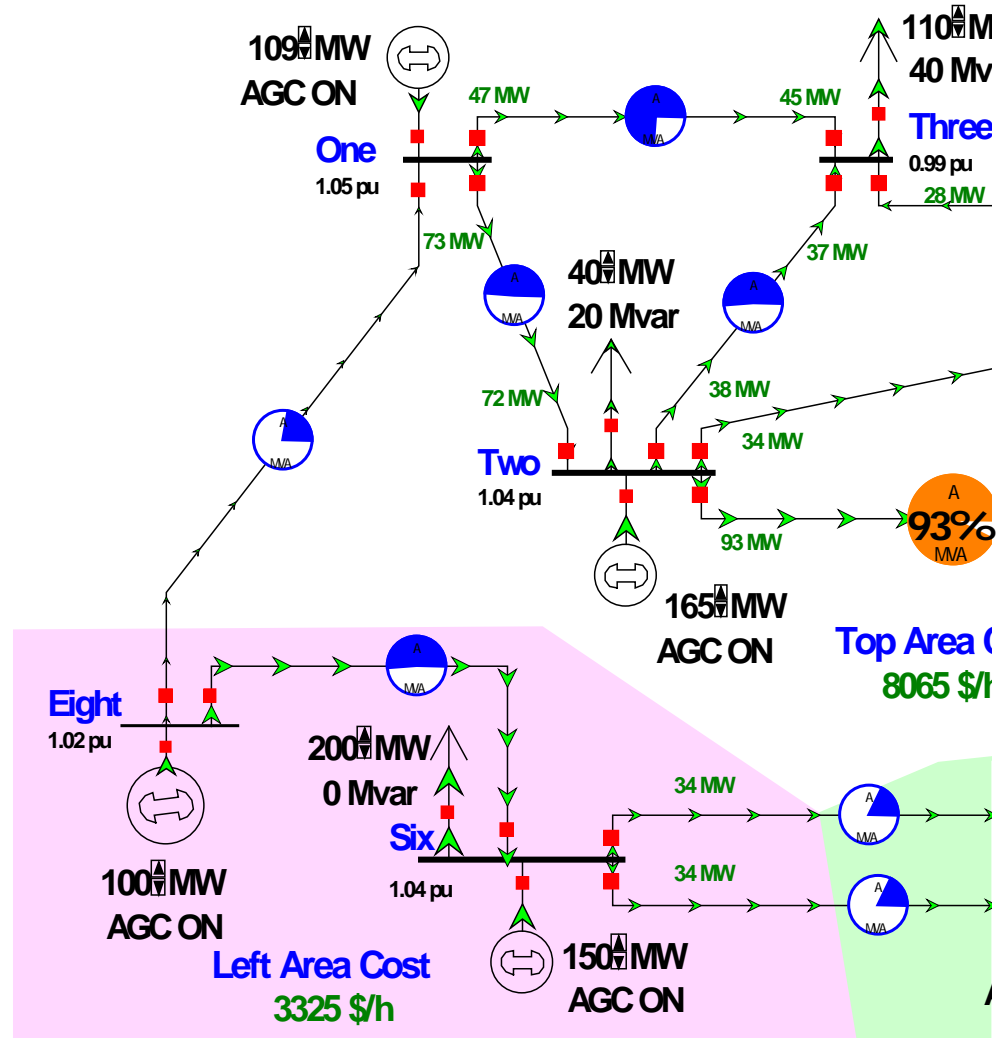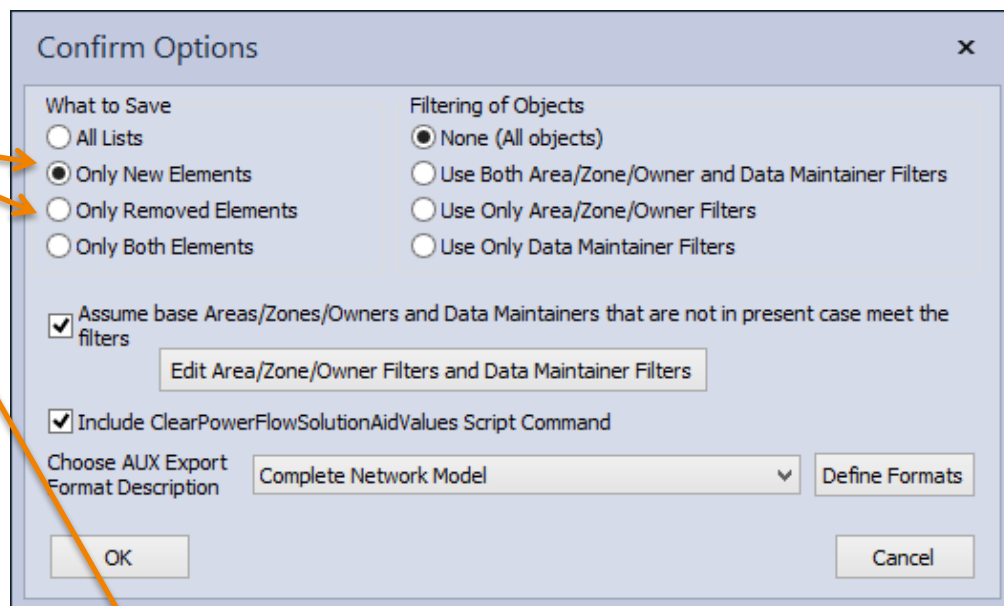
# Present Topological Differences from Base Case
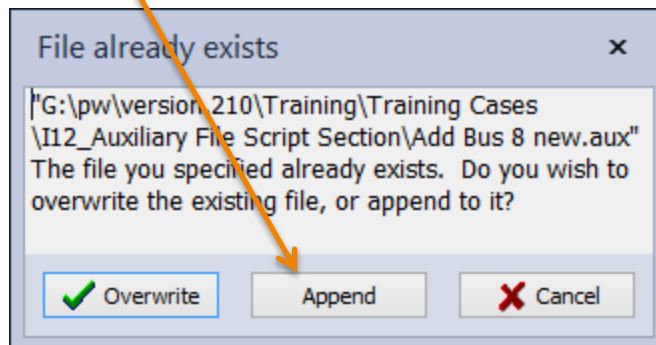
**Save To > Complete Model.**
Then save *Only New Elements* to Aux File. Repeat and save *Only Removed Elements* to same Aux File (Append)



Confirm Options

What to Save
- ○ All Lists
- ● Only New Elements
- ○ Only Removed Elements
- ○ Only Both Elements

Filtering of Objects
- ● None (All objects)
- ○ Use Both Area/Zone/Owner and Data Maintainer Filters
- ○ Use Only Area/Zone/Owner Filters
- ○ Use Only Data Maintainer Filters

☑ Assume base Areas/Zones/Owners and Data Maintainers that are not in present case meet the filters

Edit Area/Zone/Owner Filters and Data Maintainer Filters

☑ Include ClearPowerFlowSolutionAidValues Script Command

Choose AUX Export Format Description: Complete Network Model ⌄    Define Formats

OK          Cancel

File already exists

"G:\pw\version 210\Training\Training Cases \I12_Auxiliary File Script Section\Add Bus 8 new.aux" The file you specified already exists. Do you wish to overwrite the existing file, or append to it?

✔ Overwrite     Append     ✗ Cancel

# Apply the Resulting Aux File

- ## Then re-open B7FLAT.pwb and load the aux file

```
SCRIPT
{
EnterMode(Edit);
}

//--------------------------------------------------------------------------
// THE FOLLOWING SECTION CONTAINS THE NEW ELEMENTS IN PRESENT CASE
//--------------------------------------------------------------------------
Bus (Number,Name,NomkV,Slack,NomB,NomG,Vpu,Vangle,DCLossMultiplier,AreaNumber,
    ZoneNumber,BANumber,OwnerNumber,SubNumber,Monitor,LimitSet,UseSpecificLimits,
    LimitLowA,LimitLowB,LimitLowC,LimitLowD,LimitHighA,LimitHighB,LimitHighC,
    LimitHighD,Latitude,Longitude,TopologyBusType,Priority,EMSType,EMSID,
    DataMaintainerAssign,DataMaintainerInherit,DataMaintainerInheritBlock,
    AllLabels)
{
    8 "Eight"        138.0000 "NO "    0.00000    0.00000 1.01999998   9.1555098
1.000000     2     1     2      1 "" "YES" "Default" "NO " "" "" "" "" "" ""
"" "" "" "" "BusbarSection" 0 "" "" "" "YES" "NO " ""
}

.
.
.
```

# Save New and Modified Display Objects to AXD File

- Select objects on One-line
- Onelines ➔ List Display ➔ Only Selected Display Objects...

Right Click ➔ Save As ➔ Display Auxiliary File...

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