

DATA FOR POWER SYSTEM MODELING AND ANALYSIS

GCPUD Transmission Planning Policy and Procedure

Version	Version Date	Action	Reviewed By
0	3/1/2022	Initial Version	Maguire
1			
2			

Contents

- Data for Power System Modeling and Analysis1**
- Introduction3**
 - Purpose..... 3
 - Effective Date: 3
- Data Requirements4**
 - Data Required and Level of detail (R1.1, R1.2.2) 4
 - Data format (R1.2.1, R2)..... 4
 - Case types/scenarios (R1.2.3) 4
- Reporting Procedure4**
 - Point of Contact (R2) 4
 - Annual Update (R1.2.4) 4
 - Distribution and Posting (R1.3) 4
 - Coordination with WECC Case Building Process (R4)..... 4
- Managing the Process5**
 - Grant Files 5
 - WPP Files 5
 - Due Dates 5
- Reviewing the Case6**
 - Download Case for Review..... 6
 - Create a OneNote Entry for the Current Review Case 7
 - Check the Case 8

INTRODUCTION

Purpose

This document describes how to develop and review steady state, dynamic, and short-circuit data used to model Grant's Planning Coordinator Area of the Transmission System in compliance with NERC Standards MOD-032-1 and TPL-001-5. Grant Transmission Planners perform the case building process through active participation in the WECC System Review Subcommittee, by following the guidelines in the current-year WECC Data Preparation Manual, and by building cases described in the current-year Base Case Compilation Schedule. The WECC case building process is coordinated regionally, and Grant planners actively participate in the Area 40 coordination program currently facilitated through the Northwest Power Pool.

The Transmission Planning group within GCPUD functions as both the Planning Coordinator and Transmission Planner in the creation and upkeep of these modeling data requirements and reporting procedures (MOD-032-1, R1).

Effective Date:

March 1, 2022

DATA REQUIREMENTS

Data Required and Level of detail (R1.1, R1.2.2)

The level of detail for each type of facility must adhere to the guidelines as described within the current-year revision of the WECC Data Preparation Manual, which is a super-set of data described in MOD-032-1, Attachment 1.

Data format (R1.2.1, R2)

The development of power system models is based on data collected from each Balancing Authority, Generator Owner, Resource Planner, Transmission Owner, Load Serving Entity, and Transmission Service Provider within the District's Planning Coordinator Area. For GCPUD facilities, GCPUD Transmission Planning acts as all functional entities mentioned in R2. The following options are available for submitting data:

- Provide data within PowerWorld .pwb or .aux file formats
- Tabulated spreadsheet (pre-populated tables from previous submittals can be provided)

Case types/scenarios (R1.2.3)

Various case types and scenarios are developed for each calendar year according to the current-year WECC Base Case Compilation Schedule (BCCS). The BCCS typically includes the following base cases:

- Five operation cases
- Two specialized cases
- One 5-year summer planning case
- One 5-year winter planning case
- One 10-year summer planning case
- One 10-year winter planning case

REPORTING PROCEDURE

Point of Contact (R2)

Applicable entities within the District's Planning Coordinator Area shall submit documentation, data, and associated correspondence to the following email address: TransmissionPlanning@gcpud.org

Annual Update (R1.2.4)

Data shall be submitted by each applicable entity within the third calendar quarter of each year.

Distribution and Posting (R1.3)

This Data for Power System Modeling and Analysis document is posted on the District's public web page within the [Transmission Information](#) section.

Coordination with WECC Case Building Process (R4)

Grant coordinates case building with WECC (ERO) through a General Services Agreement established with the Northwest Power Pool – now the Western Power Pool (WPP) – for Area 40 coordination. WPP receives case building communications from WECC, leads the review process for Area 40 participants, provides an ftp repository for downloading and uploading base cases, and submits completed cases back to WECC once approved by the Area 40 participants.

MANAGING THE PROCESS

In general, Microsoft OneNote is used to document the review process, working files are held on the user's PC, and when the case review is completed, the working folders on the user's PC are uploaded to the WECC Case Building archive on the corporate drive.

Grant Files

All WECC case building documents are stored on a corporate drive at:

<S:\Depts\TSSystemsEngineering\Transmission Planning\WECC Case Building>. This folder includes a Microsoft OneNote [document](#) used to write notes generated during case reviews. The folder also contains calendar-year folders holding all base case development files downloaded and uploaded to/from the WPP ftp site with a structure generally mimicking the structure found on the WPP site.

WPP Files

Grant Planning engineers working on base case development will need to request ftp access from the WPP for the purpose of Area 40 coordination. The site provides a centralized location used to participate in the WECC case building process.

Due Dates

A good practice for the case building engineer is to enter due dates into Outlook before the beginning of each cycle. Dates needing a response from GCPUD are given at the start of each build season in the BCCS document. The schedule for the 2022 cycle is shown for example in Figure 1.

2022 Base Case Compilation Schedule

Case	Date Data Request Mailed	Date Data Due to Sub-Coordinate L&R Info	Date Data Due to Area Coordinator	Date Area Coordinator Due to WECC Staff	WECC Staff Send Case for Review	Date Comments Due to Area Coordinator	Date Area Coordinator Comments Due to WECC Staff	WECC Staff Finalize Date
2022 LSP2S*	4/23/21	-	5/14/21	6/11/21	7/2/21	7/23/21	8/6/21	8/20/21
2025 HS3S*	6/25/21	-	7/16/21	8/13/21	9/3/21	9/17/21	10/1/21	10/15/21
2022 HS3S	7/23/21	-	-	-	-	8/20/21	9/17/21	10/15/21
2033 LSP1S	9/17/21	10/1/21	10/8/21	10/29/21	11/19/21	12/10/21	1/7/22	1/28/22
2022-23 HW3-OP	10/15/21	11/5/21	11/12/21	12/10/21	1/7/22	2/4/22	2/25/22	3/25/22
2022-23 LW1-OP								
2023 HSP1-OP	11/12/21	12/3/21	12/10/21	1/7/22	2/4/22	2/25/22	3/18/22	4/8/22
2027-28 HW2	12/10/21	12/31/21	1/7/22	2/4/22	2/25/22	3/18/22	4/8/22	5/6/22
2028 HS2								
2023 HS4-OP	3/18/22	4/8/22	4/15/22	5/13/22	6/10/22	7/1/22	7/22/22	8/12/22
2023 LSI-OP								
2032-33 HW1	4/15/22	5/6/22	5/13/22	6/10/22	7/1/22	7/22/22	8/12/22	9/2/22
2033 HSI								

Figure 1: Example BCCS Schedule

Important due dates for Outlook are given for each case in columns four and seven, which are the dates GCPUD review files are due to be uploaded to the corresponding folders at the WPP ftp site. Column four dates indicate when Pre-run review files are due, and column seven dates indicate when Review files are due.

REVIEWING THE CASE

Download Case for Review

1. Create a local file structure to store working files.
2. Login to the WPP ftp site using FileZilla (available in Software Center) and navigate to the case under consideration. Figure 2 shows an example for the location of Pre-run files for the 28 Heavy Summer season. Pre-run cases are currently located in the *Seed Case* folder within the *Initial Case* folder for the seasonal scenario. Review cases can be found in the *WECC Review Case* folder under the *Review Case* folder just a bit below the *Initial Case* folder.

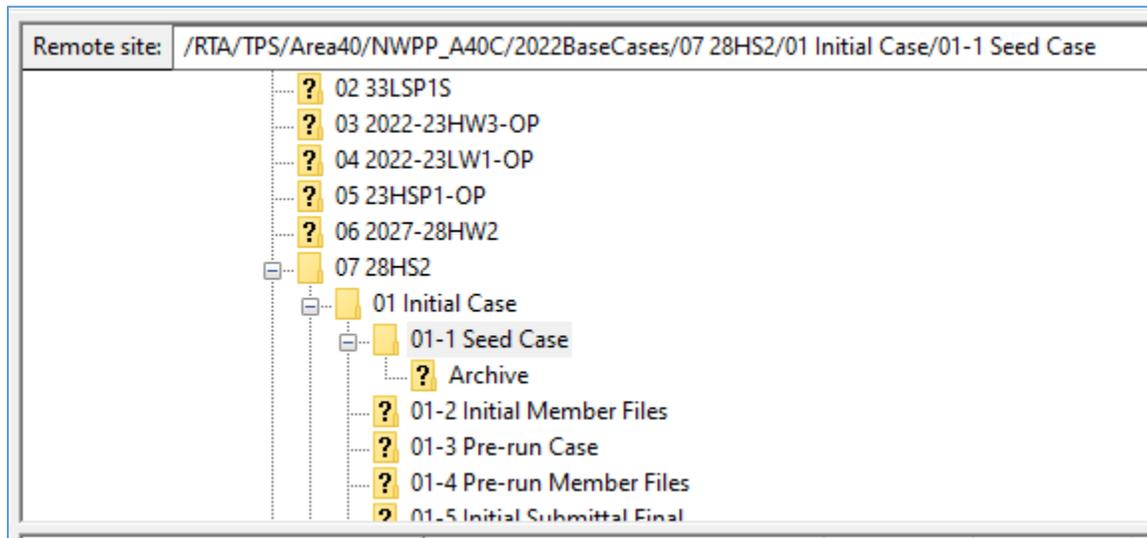


Figure 2: WPP ftp Site Structure

3. Double-clicking on the *Seed Case* folder reveals all the files in the folder and shows them in the pane below as shown in Figure 3. The left side of the display shows the users local file system which should be prepared to download case files. Double-clicking each file from the right-side panel downloads the file into the file location shown on the left-hand panel.

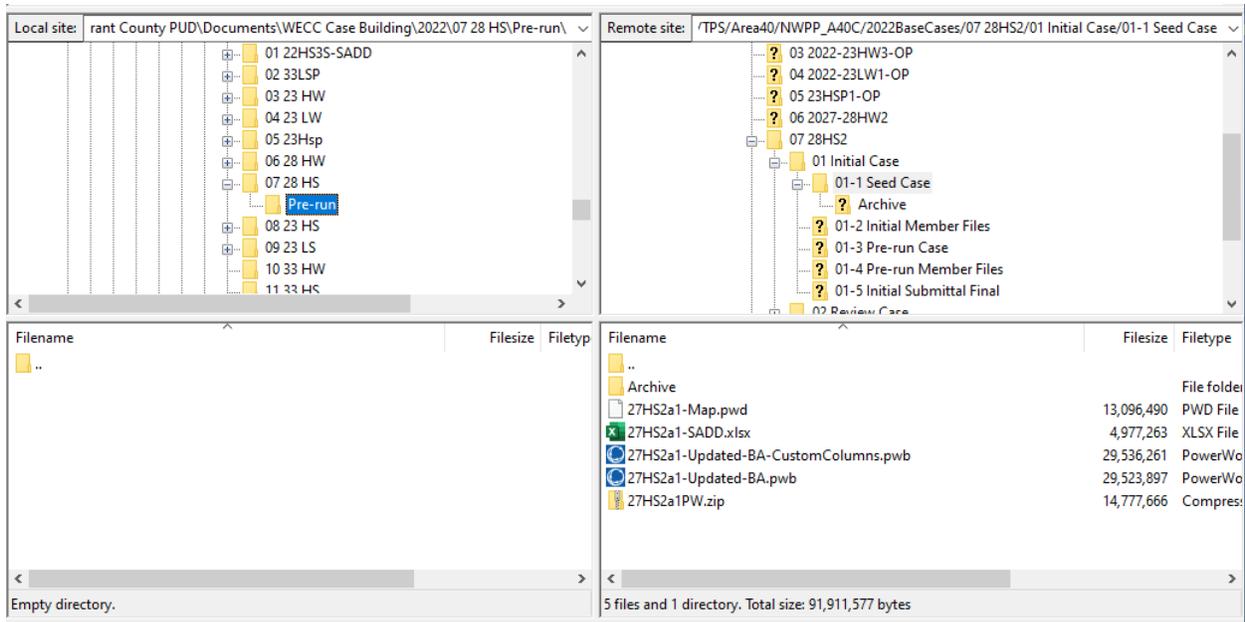


Figure 3: Case File Location

4. Extract the included zip file to open the ASMAT pdf used in the following steps.

Create a OneNote Entry for the Current Review Case

NOTE: The OneNote file is stored on the corporate drive, so you need to be onsite or connected via the vpn for access. If using the vpn, note that FileZilla will often not connect to WPP, and downloading/uploading to WPP requires the vpn be disconnected.

1. Open the WECC Case Building [OneNote](#) and navigate to the current calendar year. If this is the first case in a new cycle, create a new Section for the coming year.
2. Create a new Page for the case under review and create a Subpage for Pre-run and a Subpage for Review as depicted in Figure 4.

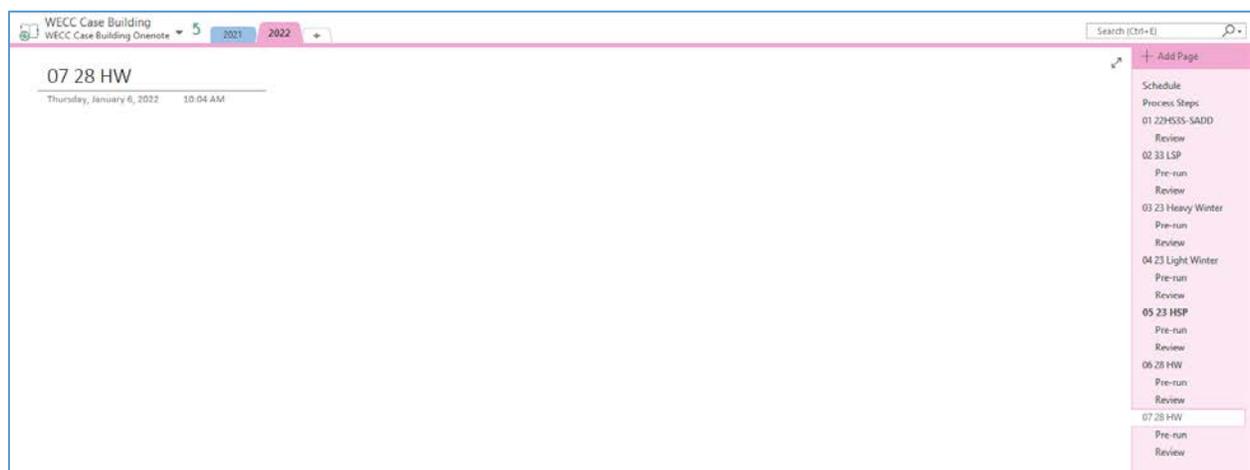


Figure 4: OneNote Entry

- Print the *Case Summary Sheet* page from the ASMAT file to OneNote, directing the print to the case main page, which should result in the page looking like that in Figure 5 for the 2023 Heavy Spring case. This provides summary information for the case under review.

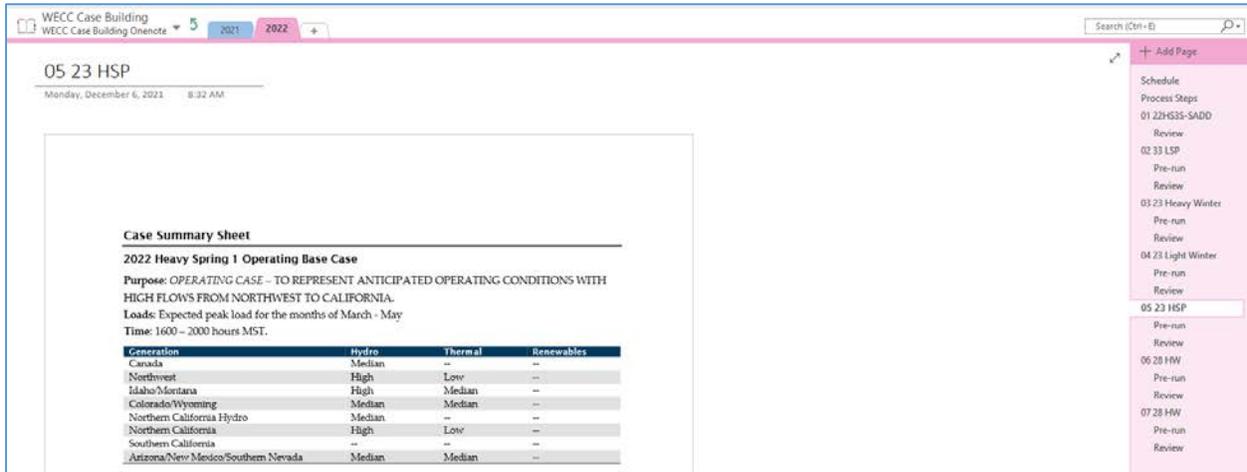


Figure 5: Case Summary Sheet to OneNote

- Use the Pre-run and Review subpages for review notes. An option for use is to copy all emails associated with the review cycle to this page, as shown for example Figure 6.

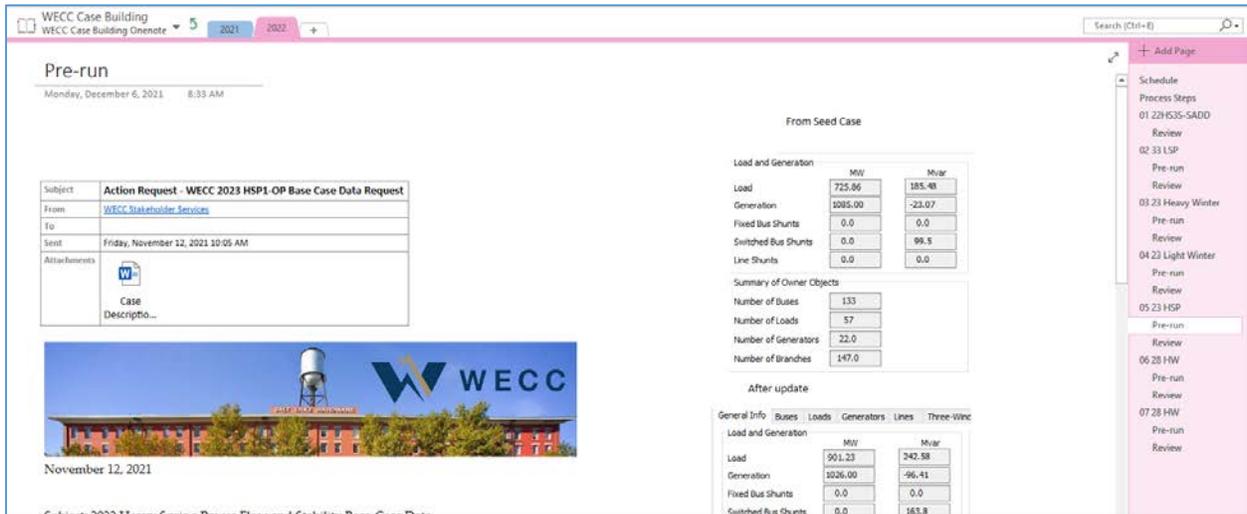


Figure 6: Email and Notes in OneNote

Check the Case

- Open PowerWorld and open the current Grant Master case. The Master case is located on the corporate drive as shown in the example of Figure 7 for the 2021-year process.

NOTE: it is very useful to download a copy of the Master case folder to the users C drive as the files in this folder are referenced often during the process, and this allows the user to disconnect the vpn which can make life much better.

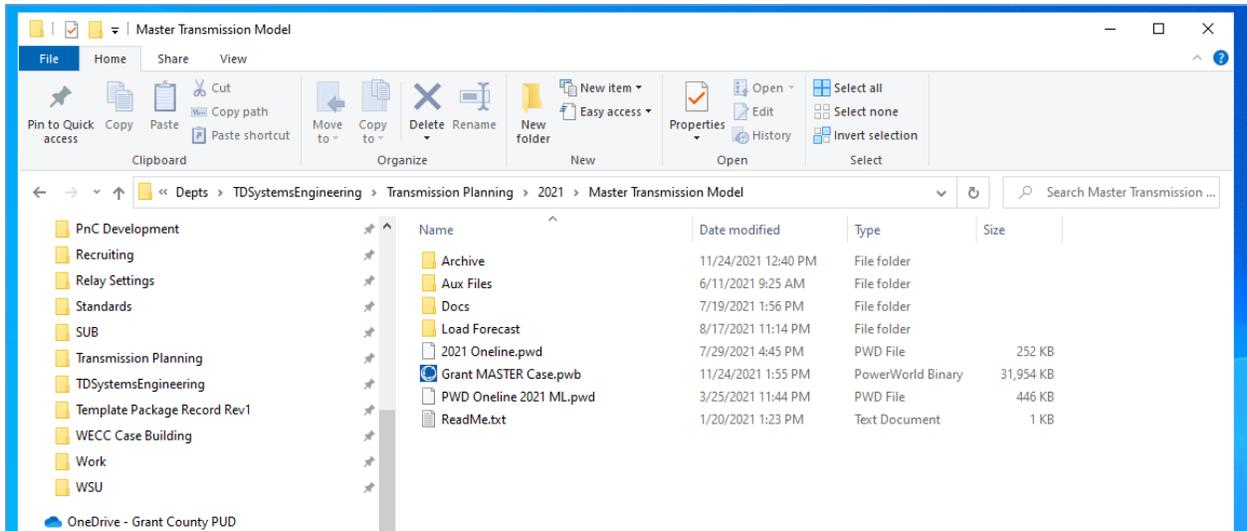
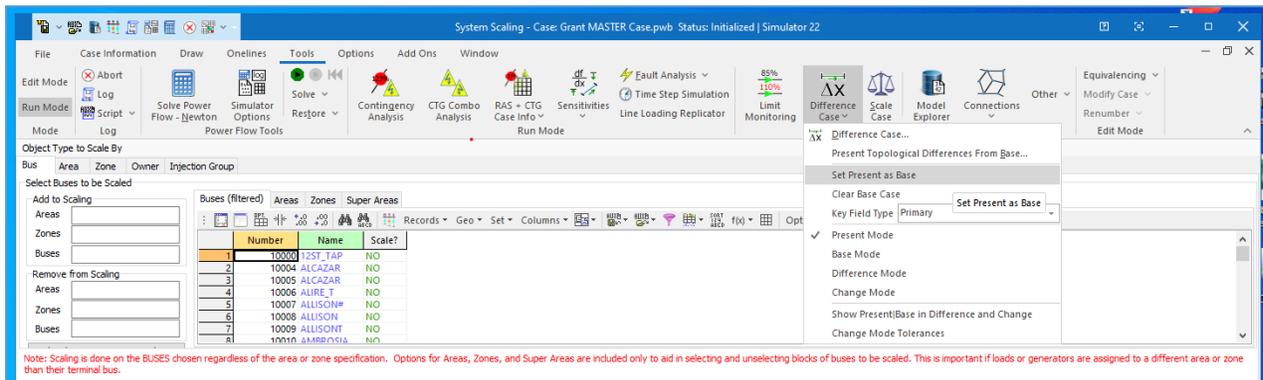


Figure 7: File Location of Master Model

2. Navigate to the Owner tab, right-click on Grant PUD, and select Show Dialogue. Screen grab the dispatch and objects section and paste in the OneNote page. This provides a simple display of before/after condition of the case.
3. Establish the Difference Case by navigating to the Tools menu, selecting the *Difference Case* icon, and clicking the *Set Present as Base* item. This saves the Master case parameters into memory. It does not matter that the Master case has a certain generation and load dispatch inherited from whatever seasonal case was used to create the master as we are only concerned at this stage with the accuracy of the system topology. Gen and load dispatch is set/verified in a later step.



4. Without closing PowerWorld, go to the File menu and open the case under review.
5. Go back to the Tools/Difference Case icon, and this time select *Present Topological Differences from Base...* This step displays all the changes it would take to update the current case topology to match the Master case topology.
6. Create the Difference .aux file by navigating to the bottom of the Difference tool window and selecting *Save To* then *Complete Model*.
7. Set the options as shown in Figure 8 and select *OK*. The Master case filters and Aux File Export are set to limit the export items to those owned by Grant.

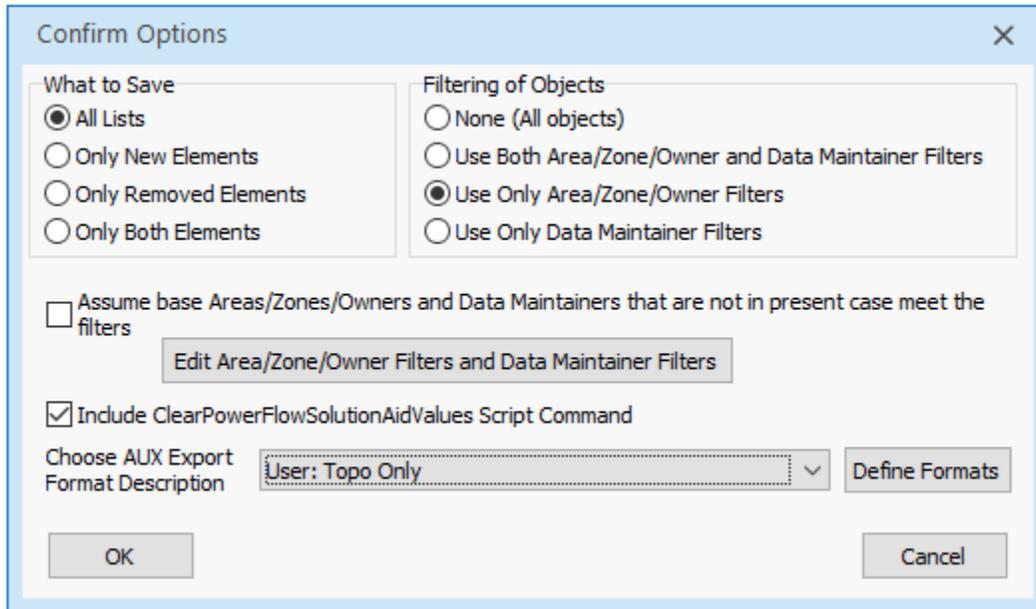


Figure 8: Difference Save Options

8. Open the aux file for editing in Notepad++ (available in Software Center), and delete the following lines:
 - a. Delete the Owner sections in both the New and Removed sections of the aux file
 - b. Delete the Data Maintainer sections in the New and Removed sections
 - c. Look for any non-Grant topology mentioned in the New and Removed sections.
 - d. It can be helpful to have PowerWorld open in one monitor and the aux file opened in another for easy cross-referencing as one edits the aux.
9. Save the aux file using a format like *28HS Grant Pre-run Update*.
10. Set the required seasonal load dispatch using the current load forecasting process, adding the appropriate aux file syntax to the end of the update file.
11. Set the required seasonal generation dispatch by copy/paste using the generation dispatch aux file syntax within the dispatch files located in the Master case directory in the Aux Files/Generation folder.
12. Open the review case and load the update aux file, checking the log for any errors during the load and then during a solve.
13. Check overall topology by loading the Master case oneline, switching to Edit mode and looking for any facilities in Pink, meaning the facility drawn on the oneline is not actually in the case.
14. Run Contingency Analysis using all but P3 & P6 outage definitions to check for any Grant violations.
15. Login to the WPP ftp site and upload the newly created update aux file to the appropriate folder within the GCPUD structure. WPP looks in these folders for all case updates.
16. Copy the local case building folder to the corporate drive for archive.
17. Make any final notes in the OneNote page, and you are finished.