	© ISO New England Inc. 2022	Procedure: Long Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

SOP-OUTSCH.0030.0070


Long Term Outage Economic Analysis

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1. Objective

Evaluate long-term transmission outages for a given Operating Day based on anticipated loads, network configuration and Resource outages to determine economic cost per outage.

Reposition transmission outages that exceed an incremental production cost of \$200,000 per week as appropriate.


A Planned Transmission Outage request that is submitted ninety (90) days or greater in advance of the start date and takes a Major Transmission Element (MTE) out-of-service (OOS), is subject to a Long Term Outage Economic Analysis evaluation. This procedure is performed as necessary, Monday through Friday, excluding weekends and holidays

2. Background/Introduction

This procedure is intended to provide instructions for performing an economic analysis of transmission outages in the Long Term using the PoRtfolio Ownership Bid Evaluation (PROBE) application. PROBE can calculate the production cost within a twenty-four (24)-hour period (multiple days can be studied simultaneously). This economic analysis can determine the production cost impact of an individual outage through case comparison analysis and can project Locational Marginal Prices (LMPs) and Resource commitment. By providing an assessment of potential market inefficiencies at least ninety (90) days in advance of the start date of the transmission outage, the Transmission Owner (TO) and Market Administration are afforded an opportunity to evaluate actions that could alleviate the economic exposure. These actions include coordinating Resource and transmission outages, advanced notifications to affected parties and publicly posting the outage information, if permissible under the ISO New England Information Policy.

Triggers:

- A Planned Transmission Outage request that is submitted ninety (90) days or greater in advance of the start date and takes an MTE OOS may receive a Long Term Outage Economic Analysis evaluation. Some equipment identified as an MTE does **not** create congestion but imposes requirements on local Resources. Through reliability studies and system experience, the Long Term Outage Coordination (LTOC) Department will determine when an MTE outage causes adverse economic impact. The LTOC staff may then perform an economic analysis evaluation as necessary for planned long-term outages (both transmission and Resource based on the outage scenario). This procedure is performed as necessary, Monday through Friday, excluding weekends and holidays.

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Inputs:


- Resource offers
- Increment offers and decrement bids (use is optional)
- Transmission outages
- Load Forecast
- Operating Reserve Requirements
- Interface limits
- External tie-line bids
- Resource requirements for reliability/voltage
- Resource reductions
- Resource outages

Outputs:

- Outage cost determination
- PROBE case reports
- Long Term Outage Economic Analysis Checklist - Attachment A

Applications/Systems/Tools

- PROBE
- CaseBuilder
- Generation Requirements for Transmission Constraints (GRT) spreadsheet
- ISO Outage Scheduling software
- EMS Powerflow/STCA
- EMS DoubleC
- Total Transfer Capability (TTC) Calculator

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3. Responsibilities

The Outage Coordinator, Long-Term Outage Coordination, performs this procedure

4. Controls

1. System Access

PROBE, CaseBuilder, EMS, and TTC Calculator access is required and obtainable through the Enterprise Access Management software with the appropriate approvals.

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5. Instructions

5.1 Set Up Initial Day-Ahead Study System Case

5.1.1 Determine Transmission Line Outages to be Studied


1. The Outage Coordinator shall DETERMINE transmission outages to be analyzed from the “Economic Study Tracking” spreadsheet by performing the follow actions:
 - A. OPEN the Long-Term Outage Coordination SharePoint site.
 - B. OPEN the “Economic Study Tracking” spreadsheet located in the Documents folder.
 - C. Using the following criteria, DETERMINE which transmission line outage should be studied:
 - (1) Submitted ninety (90) days or greater in advance of the start date
 - (2) Is an MTE
 - (3) Imposes greater requirements than local Resources
 - D. RECORD the transmission outage that is to be studied on Attachment A – Long-Term Outage Economic Analysis Checklist along with study-date(s).
 - E. If applicable, the Outage Coordinator shall also SELECT any other Long-Term Outage of significant interest for study.

5.1.2 Determine Peak Load Value for Operating Day

1. Using the 50/50 loads or a more appropriate load level, the Outage Coordinator shall CROSS REFERENCE the Operating Day date with a peak load value and RECORD the “Projected Peak Load” on Attachment A – Long-Term Outage Economic Analysis Checklist.

5.1.3 Evaluate and Print Transmission Line Outages

1. The Outage Coordinator shall EVALUATE transmission outages for the study-day(s) as follows:
 - A. OPEN the ISO Outage Scheduling software application.
 - B. From the top menu bar, SELECT “Reports/Transmission/ISO Report”.
 - C. In the “Filter” box, SELECT the “Custom” button in the “Date Range” box.
 - D. In the bottom left-hand box titled “End Date On or After” ENTER the start date.
 - E. In the upper right-hand box titled “Start Date On or Before” ENTER the end date.

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F. For the “Outage Status”, SELECT the following:

- (1) “Interim Approved”
- (2) “Approved”
- (3) “Implemented”
- (4) “Study”
- (5) “Negotiate”


G. SELECT “Generate” and VERIFY an Excel spreadsheet appears showing the filtered transmission line outages.

H. PRINT “Outages”

I. INSPECT transmission outages for the study period.

5.1.4 Print out the Generator Outages

1. The Outage Coordinator shall PRINT the Generator Outages for study-date (s) as follows:
 - A. OPEN the ISO Outage Scheduling software application.
 - B. From the top menu bar, SELECT “Reports/Generation/Generation Outage Summary”
 - C. In the “Filter” box, SELECT the “Custom” button in the “Date Range” box.
 - D. In the bottom left-hand box titled “End Date On or After” ENTER the start date.
 - E. In the upper right-hand box titled “Start Date On or Before” ENTER the end date.
 - F. For the “Outage Status”, SELECT the following:
 - (1) “Approved”
 - (2) “Implemented”
 - G. For the “Priority Status”, SELECT “ALL”
 - H. For the “Constraint”, SELECT “ALL”
 - I. For the “Asset Name”, SELECT “ALL”
 - J. SELECT the “Generate” button and PRINT an EXCEL spreadsheet

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- 5.1.5 Create an EMS Basecase** 1. The Outage Coordinator shall CREATE an EMS Basecase with the study outage “In-Service” as follows:

NOTE

Refer to SOP-OUTSCH.0030.0025 - Perform Long Term Outage Coordination - Transmission for instructions to create a basecase in EMS.


- A. From the appropriate Powerflow Basecase, CREATE a Basecase that reflects the study-day(s) with the study outage in-service
- B. EXPORT to PowerWorld as an Aux file

- 5.1.6 Create an EMS Testcase** 1. The Outage Coordinator shall CREATE an EMS Testcase with the study outage “Out of Service” as follows:

- A. From the EMS Basecase that was created in the previous step, CREATE a Testcase that reflects the study-day(s) with the study outage “Out of Service”.

- 5.1.7 Run TTC Calculator** 1. Using the TTC Calculator, the Outage Coordinator shall DETERMINE Basecase interface limits (e.g., Connecticut Import Proxy value) as follows:

- A. LOG into TTC Calculator
- B. SELECT the “HE” peak hour of the day (or another depending on the study)
- C. SELECT “Day Ahead” for Target Application
- D. SELECT the study Basecase that was exported from the EMS program
- E. ENTER a description for the case
- F. SELECT interfaces for study (usually “All”)
- G. SELECT “Run”
- H. When the TTC Calculator has finished processing, PRINT the results and/or SAVE as .pdf to case folder
- I. When each interface calculation is verified as valid:
 - (1) COPY the appropriate values into a GRT Spreadsheet
 - (2) PRINT for later use
- J. For the interfaces that are impacted from an outage:

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(1) COPY steps above for Testcase as appropriate

(2) RE-RUN the TTC Calculator

5.1.8 Determine “Like-day” for Resource Offer Import


1. Using the Projected Peak Load determined in step 5.1.2 REVIEW historical load forecast reports and LOCATE a day that approximately clears the referenced peak load.
 - A. REVIEW historical loads that are e-mailed from the Forecaster and perform the following:
 - (1) SELECT one of the following:
 - a. A weekday or weekend day that matches the 50/50 peak load value
 - b. The latest offer data depending on the normalcy of the data
 - (2) CONSIDER using the offer data from a comparable month/season from the previous/current year.
 - B. RECORD day on Attachment A – Long-Term Outage Economic Analysis Checklist.

5.1.9 Create a Study Case Folder

1. The Outage Coordinator shall CREATE a new study case folder:
 - A. START “Remote Desktop Connection”
 - B. LOG IN to production server: TARAENFP1A
 - C. NAVIGATE to appropriate user directory
 - D. CREATE a new study case folder with the appropriate name (e.g. “batch_run_MM_DD-MM_DD” or “MM_DD_YYYY” or “1845_Line_outage”, etc.).

5.1.10 Create PROBE input files

1. CREATE PowerWorld model and a contingency file (if desired) for the PROBE market run as follows:
 - A. LOAD all-lines-in basecase to EMS Powerflow and run solution
 - B. CLICK “Data Retrieval” and enter appropriate Savecase Title to include the network model number and date (example: ALI_2.X.XX_Jan26)
 - C. CLICK “Model File” to create the PowerWorld model file. The letters “model_pf_pwrflow” will be automatically appended
 - D. PERFORM one of the following actions:


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- COPY EMS all-lines-in basecase into STCA and RUN solution
 - USE the contingency case that is automatically updated via the control room
- E. CLICK “Data Retrieval” and enter appropriate Savecase Title to include the network model number and date (example: ALI_2.X.XX_Jan26).
- F. CLICK “Generate PowerWorld Contingency File” and VERIFY the letters “ctgs_stca” are automatically appended to the resulting file.

NOTE

CaseBuilder will create a folder for each study-day selected (e.g., if five (5)-day spread is selected, then five (5) separate daily folders will be created with custom files for that day). Only one (1) market (source) day is allowed per CaseBuilder run. If more than one (1) source day is desired for batch run studies, then CaseBuilder will need to be run as many times as market (source) days are needed.

2. The Outage Coordinator shall CREATE PROBE input files with CaseBuilder as follows:
 - A. START remote desktop connection
 - B. LOG into TARAENFP1A
 - C. OPEN the “C” drive
 - D. OPEN the “IT DA Supported Apps” folder
 - E. OPEN the “Shortcut to CaseBuilder” file
 - F. In the upper left-hand corner, SELECT the “Export files” icon
 - G. In the “Study Mode” box, SELECT “PROBE - Long Term Economic Look Ahead”
 - H. In the “Case Name” box, ENTER the appropriate name
 - I. In the “Destination Folder” SELECT the appropriate destination folder to store the data (and currently STORE the respective destination folders in your personal folder on TARAENFP1A).
 - J. SELECT the Start/End dates of the study
 - K. SELECT the data source day for bids and offers

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L. SELECT the proper “N-1 Contingency Override file” (this can either be a specific contingency file that was created by the user or the contingency file that is automatically created “ctgs_rtca_autorun_rtca_ems”)

M. SELECT the proper “Network Model File”

N. SELECT the proper “Zonal Factors File”

O. SELECT the appropriate “Forecast File”

P. To create files, SELECT the “RUN (Export)” button


Q. CLOSE the CaseBuilder program

5.1.11 Adjust Reserve Requirements

1. As necessary, ADJUST the reserve requirements as follows:

A. OPEN the “reserve_requirements.csv” file

B. ENTER the appropriate reserve requirements applicable to the available Resources

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5.1.12 Adjust Startup/Notification Times


1. If this is a one (1) day study, ADJUST the startup/notification times_and PERFORM the following:
 - A. OPEN the “bid_data.csv” file
 - B. SET all start-up times and notification times to “0”
 - C. SAVE the file
2. If this is a multiple day scenario, ADJUST only the first day and PERFORM the following:
 - A. OPEN the “bid_data.csv” file
 - B. SET all start-up times and notification times to “0”
 - C. SAVE the file

5.1.13 Add Required Manual Constraints

1. ENTER any constraints (e.g., stability limits, external tie limits or Resource limitations) determined from the transmission/Resources outages into the “flowgate_override.csv” file
 - A. As necessary, REFER to Transmission Operating Guides

5.1.14 Modify Interface Limits

1. MODIFY interface limits with appropriate values from the GRT spreadsheet as follows:
 - A. OPEN the “flowgate_override.csv” file and as appropriate, CHANGE the interface values derived from the GRT spreadsheet
 - B. If running Batch Mode, as appropriate, COPY the data into the other days flowgate override files

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5.1.15 Identify Must Run Resource(s)

NOTE

Under the Forward Capacity Market (FCM), a Must Run Resource can only be committed up to its Capacity Supply Obligation (CSO).

1. The Outage Coordinator shall ENTER any Resources designated as “Must Run” for 1st or 2nd contingency reliability into the “unit_status.csv” file with a designation of “S” for the hours required.

NOTE

- A = Available, or offered in Economics
- P = Pool Scheduled, will appear if the unit_status.csv file is produced from a solved Day-Ahead case
- M = Must Run, meaning Self-Schedule
- U = Unavailable
- S = Manually Scheduled

2. In the “unit_status.csv” file, ENTER any identified non-fast start units committed for reliability with a designation of “S”


5.1.16 Manually Change Device Status

1. The Outage Coordinator shall IDENTIFY any breakers or disconnects that need to be manually entered due to any of the following:
 - overrun outages returning during the Operating Day
 - compensatory actions (e.g., Transmission Operating Guides)
 - notification from any of the System Operations Departments
 - notes in the comment section of ISO Outage Scheduling software.

NOTE

Breakers and disconnects are entered in hour ending (HE).

2. In the “Breaker_Override.csv” file, ADD a breaker or disconnect as a new line for the appropriate time periods for each study-day

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5.1.17 Enter any Applicable Abnormal Limits or NX-9 Limit Changes

1. If necessary, ENTER branch limit changes as new lines in the “Branch_Override.csv” file for the appropriate time periods for each study-day.

5.1.18 Compare Excluded Contingencies

1. CHECK the contingencies that are “Excluded” in the “Contingency_override.csv” file against the contingencies “Disabled” in RTCA and RESOLVE any discrepancies.

5.1.19 Set Up Probe Options


1. The Outage Coordinator shall SET UP PROBE options and SELECT reports using either Method 1 or Method 2 below:

A. Method 1

- (1) REFER to ATTACHMENT B - PROBE Look Ahead Study Options Set-up
- (2) VERIFY options set as shown

B. Method 2

- (1) CLICK “Import Scenario Settings” from the PROBE simulator main menu
- (2) SELECT PROBE_ViewerNE_XXX_Options.csv”

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5.2 Run the Initial Day-Ahead Study Basecase with the Transmission Outage Being Studied “IN-SERVICE” (i.e., Exclude the Outage)


5.2.1 Run PROBE BaseCase

1. If running a multi-day scenario (Batch Mode), the Outage Coordinator shall REFER to Attachment D.
2. If running a one (1) day scenario, the Outage Coordinator shall RUN the PROBE BaseCase as follows:
 - A. DOUBLE CLICK on the PROBE icon to log into the PROBE viewer program.
 - B. On the Input Files tab, NAVIGATE to the study folder in the Data Directory field.

NOTE


After selecting the proper study folder, the pertinent files are automatically loaded into PROBE. Any files that **cannot** be found will be highlighted in pink. For “Look Ahead” study mode, the “final_dispatch”, “demand_dispatch”, and cleared_transactions” files are **not** needed and should be pink.

- C. In the “Date” field, VERIFY “Use Date” is **not** selected
- D. In the “Select Mode” field, VERIFY “Look Ahead” is selected
- E. SELECT “Enforce Engine Restart”
- F. SELECT “Probe Simulator” tab and VERIFY all reports are checked as desired
- G. SET the study-date in the “Study Window” tab in Simulator Options (See Appendix B – Section 12)
- H. CLICK “Create Report” only for the reports checked in this view or SELECT “Create Reports from ALL Tabs for all reports selected
- I. After the case has solved:
 - (1) REVIEW the “Input Warnings Summary” for any input file error
 - (2) As necessary, MODIFY any input files and RE-RUN the case as follows:
 - a. CLICK “Create Custom ISO-NE Reports” button and file path
 - b. SELECT the desired reports
 - c. CLICK “Create”

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J. REVIEW all selected reports and PERFORM the following:


- (1) As necessary, MAKE adjustments and RE-RUN the case
- (2) When satisfied with the results, RECORD “Bid Production Cost” on Attachment A – Long-Term Outage Economic Analysis Checklist

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5.3 Determine Incremental Production Cost (i.e., Include the Transmission Line Outage Being Studied)

5.3.1 Run Additional PROBE Cases to Determine Incremental Production Costs

1. The Outage Coordinator shall RUN additional PROBE cases to determine incremental production costs as follows:
 - A. APPEND the Original data file with “_Basecase”
 - B. COPY the data file for use with the test case
 - C. INCLUDE transmission outage being studied in the “Trans_Outage.csv” file
 - D. To add each Must Run Resource for the outage being studied, in the “Unit_Status.csv” file PERFORM the following:
 - (1) CHANGE the Must Run Resource status to “S”
 - (2) SAVE the file
 - E. In the “interface_generic.aux” file, MODIFY any interface limits or Resource limitations associated with the outage being studied and SAVE the file
 - F. In the “Breaker_Override.csv” file, MODIFY any breakers for the outage being studied and SAVE the file
 - G. In the “Branch_Override.csv” file, MODIFY any branch limits for the outage being studied and SAVE the file
 - H. Select “Enforce Engine Restart”
 - I. To execute PROBE, CLICK “Create Reports” or “Run Batch Process...”
 - J. For each case run, PRINT and RETAIN Production Cost, System Summary, Reserve Summary, Unit Hourly, Constraint Summary LMP Summary and Transaction Hourly Details reports
 - K. RECORD the incremental Production Cost on the Attachment A Checklist
 - L. SUBTRACT the “Base Case” Production Cost from the Test Case” value and EVALUATE Production Cost (less positive or more negative is a better Production Cost)
 - M. If production cost delta is greater than \$200,000 per week (extrapolated from a one (1) day run), NOTIFY the Supervisor, Long-Term Outage Coordination

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- N. If necessary, CONTACT the affected LCC and DISCUSS potential reschedule dates
- O. If the outage was moved, WRITE a brief summary of the analysis
- P. RECORD the Production Cost delta and, if necessary, the “Reposition Cost” in the ISO Outage Scheduling software application and VERIFY the “Economic” flag for the studied outage request.
- Q. UPDATE the Long-Term Outage Coordination “Economic Study Tracking” spreadsheet

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6. Performance Measures

This procedure is properly followed when the Long-Term Outage Economic Analysis Checklist is completed and applicable notifications are made.

7. References

ISO New England - ISO New England Inc. Transmission, Markets, & Services Tariff, Section III, ISO New England Market Rule 1 - Standard Market Design (Market Rule 1)


ISO New England - ISO New England Inc. Transmission, Markets & Services Tariff, Attachment D - ISO New England Information Policy

ISO New England Operating Procedure No. 3 - Transmission Outage Scheduling (OP-3)

SOP-OUTSCH.0030.0025 - Perform Long Term Outage Coordination - Transmission

8. Revision History

Rev. No.	Date	Reason	Contact
0	12/17/08	Initial draft procedure.	Peter Harris
1	04/02/09	Biennial review; Revised for CROW software and process changes	Peter Schroeder
2	06/01/10	Changed procedure ownership to Peter Bernard; Deleted Attachment A from Reference Section; Updated to include new FCM rules	Peter Bernard
3	03/29/11	Biennial review by procedure owner; Updated Header copyright date; Replaced Footer page numbers with Page X of Y format; Section 1, updated criteria for economic analysis; Section 2, defined DASS and made minor edits; Section 5 changes: 5.1.3 changed Short Term to Long Term; 5.1.5 inserted new steps 10 & 11; 5.1.6, deleted former step 1 and added new steps 1 through 3; 5.1.12, replaced NTTR with Short Term Outage Scheduling Software; 5.1.14, replaced SAM with ISO Outage Scheduling Software; 5.3.1, added new steps 12 & 13; Section 7: updated references Attachment A : added steps 15, 23 & 24, performed minor edits, added Commitment Decision Log sheet	Peter Bernard
4	08/04/11	Complete re-write to support the use of the new PROBE application for Long Term Outage Economic Analysis.	Peter Bernard

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5	04/05/12	Updated Header copyright date, & Procedure Owner; Deleted the 2 nd paragraph of the disclaimer on 1 st page footer; Section 5, Re-write of most of Section 5 o reflect the current methodology of PROBE; Attachment A, Updated to reflect changes in Section 5; Attachment B, Options were entirely updated; Attachment C, added new Attachment C; Attachment D, added new Attachment D	Mike Courchesne
6	03/28/13	Biennial review completed by the procedure owner; Refined procedure to accommodate process changes, display changes and change to Option settings;	Mike Courchesne
6.1	03/11/15	Periodic review performed requiring no changes; Made the administrative changes required to publish a Minor Revision per SOP-RTMKTS.0210.0010 Section 5.6;	Mike Courchesne
6.2	12/20/16	Periodic review performed requiring no changes; Made the administrative changes (added required corporate document identity to all page footers) required to publish a Minor Revision per SOP-RTMKTS.0210.0010 Section 5.10;	Mike Courchesne
7	12/11/18	Biennial review completed by procedure owner; Headers, updated Process Name and Procedure Owner; Globally, made minor administrative changes and editorial changes consistent with current practices and management expectations;	Norm Sproehnle
8	12/07/20	Biennial review completed by the procedure owner; Updated procedure owner;	Andrew Kopacka
	10/26/22	Biennial review completed by procedure owner; Updated TARA server name; minor editorial changes;	Andrew Kopacka


9. Attachments

Attachment A – Long-Term Outage Economic Analysis Checklist

Attachment B - PROBE Look-Ahead Study Options Set-up

Attachment C - Casebuilder Set-up and Operation


Attachment D - PROBE Batch Mode Set-up and Operation

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Attachment A – Long-Term Outage Economic Analysis Checklist

Economic Analyst _____ Today's Date _____ Operating Day _____


Step	Complete	
1.	_____	Determine Outages to be analyzed. Print and retain transmission outage report for desired Operating Day from ISO Outage Scheduling software. Outages to be Analyzed: _____
2.	_____	Determine peak load to be studied: _____
3.	_____	Print out transmission line outages for study-date(s)
4.	_____	Print out Resource outages for study-date
5.	_____	Create an EMS Basecase with study outage in-service
6.	_____	Create an EMS Testcase with study outage out-of-service
7.	_____	Run TTC Calculator for Basecase and update GRT Base Spreadsheet.
8.	_____	Run TTC Calculator for Testcase and update GRT Test Spreadsheet
9.	_____	Determine a day to retrieve historical Bids/Offeres from _____
10.	_____	Create a folder on the TARAENFP1A for the outage(s) to be studied or day(s) to be evaluated Name of Study Folder: _____
11.	_____	Execute CaseBuilder to create input files for selected study-date(s)
12.	_____	Adjust zonal factors as desired for study-day conditions
13.	_____	Adjust Reserve Requirements as desired for study-day conditions
14.	_____	Set Start-up/Notification times to "0" for all Resources in the "bid_data.csv" file (if desired)
15.	_____	Enter any applicable Manual Constraints into the "flowgate_override.csv" file as determined using ISO Outage Scheduling software
16.	_____	Copy GRT limits into "flowgate_override.csv" file
17.	_____	Identify any Must Run Resource(s) for reliability and enter a status of "S" for the hours desired in the "unit_status.csv" file

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Step	Complete	
18.	_____	If necessary, enter manual breakers or disconnects into the “Breaker_Override.csv” file as determined from the ISO Outage Scheduling software or transmission operating guides
19.	_____	Enter any branch limit changes as required (Revised Normal / LTE rating) into the “Branch_Override.csv” file
20.	_____	Inspect the real-time contingency file and modify the study “contingency_override.csv” file as necessary
21.	_____	Setup PROBE simulator options using ATTACHMENT B and select the study-day or first study-day if analyzing a multiple day run
22.	_____	Execute PROBE by selecting the “Create Reports” or “Create Reports from ALL Tabs” button
23.	_____	Append report names with “_date-base”, and then analyze reports, make adjustments and re-run PROBE as required
24.	_____	Record Production Cost
25.	_____	Include the outage to be studied in the “Trans_Outage.csv” file
26.	_____	Update “flowgate_override.csv” file as appropriate (interface limits, Transmission Operating Guides, etc.)
27.	_____	Update “Breaker_Override” file as appropriate
28.	_____	Update “Branch Override.csv” file as necessary
29.	_____	Designate any generation as Must Run for reliability in the “Unit_status.csv” file
30.	_____	Execute PROBE case. Analyze case, and when complete, record Production Cost, print and retain results
31.	_____	Compare Production Costs between the Basecase and the Testcase
32.	_____	For cases with incremental Production Cost greater than \$200.000 notify the LCC and Supervisor, Long-Term Outage Coordination and, if appropriate, reposition outage to a different time period
33.	_____	Save PROBE workbook to study folder created in Step 2 and, if desired, print “Production Cost,” “System Summary,” “Reserve Summary,” “Unit Hourly Details,” “Constraint Summary,” “LMP Summary,” and “Transaction Hourly Details” reports for each case and save in hard copy folder


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Step	Complete	
34.	_____	Write up a brief summary with outage details, assumptions and overall change in Production Cost if the outage was moved
35.	_____	Record Production Cost delta, and Reposition Cost (if necessary) in the ISO Outage Scheduling software program for the specific outage request
36.	_____	Check the “Economic” check box in the ISO Outage Scheduling software program for the outage request
37.	_____	Update the Long-Term Outage Coordination “Economic Study Tracking” spreadsheet

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Single Day Production Cost Summary Sheet

	Case Name	Production Cost	Difference	Comments
Basecase				
Scenario 1				
Scenario 2				
Scenario 3				

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Production Cost - Multi-Day (batch run) Analysis

Case/Scenario Name:


Day	Basecase Production Cost	Scenario 1 Production Cost	Difference	Comments
		Total Delta		

Case/Scenario Name:

Scenario 2 Production Cost	Difference	Comments
		Total Delta

Case/Scenario Name:

Scenario 3 Production Cost	Difference	Comments
		Total Delta

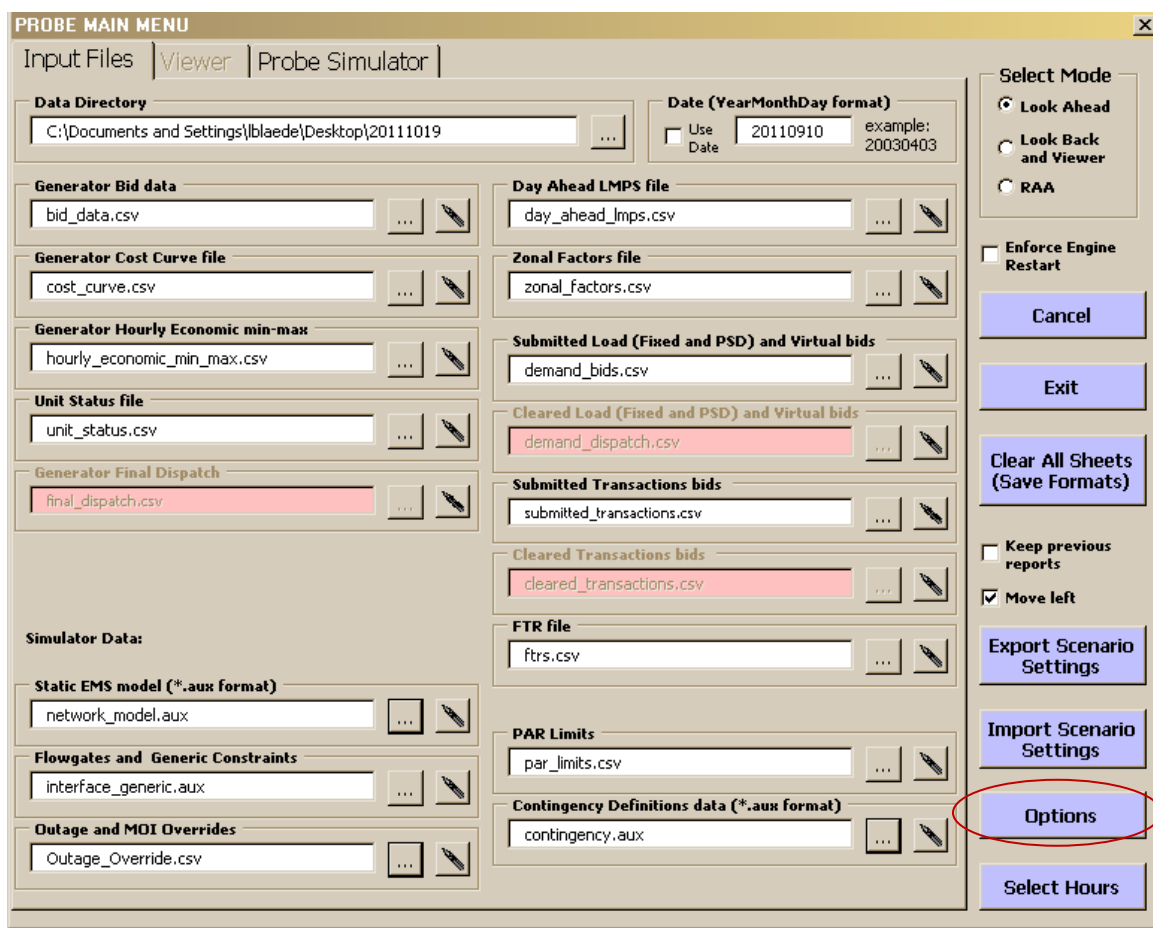
	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
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	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
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Attachment B - PROBE Look-Ahead Study Options Set-up

The following steps are used to set up PROBE for a Look-Ahead study using a fixed load forecast.

PROBE General Options:

Once PROBE has been saved, these options will also be saved.



The screenshot shows the PROBE MAIN MENU window with the following sections and options:


- Input Files:**
 - Data Directory:** C:\Documents and Settings\blae\l\Desktop\20111019
 - Date (YearMonthDay format):** 20110910 (example: 20030403)
- Generator Bid data:** bid_data.csv
- Generator Cost Curve file:** cost_curve.csv
- Generator Hourly Economic min-max:** hourly_economic_min_max.csv
- Unit Status file:** unit_status.csv
- Generator Final Dispatch:** final_dispatch.csv
- Day Ahead LMPS file:** day_ahead_lmcs.csv
- Zonal Factors file:** zonal_factors.csv
- Submitted Load (Fixed and PSD) and Virtual bids:** demand_bids.csv
- Cleared Load (Fixed and PSD) and Virtual bids:** demand_dispatch.csv
- Submitted Transactions bids:** submitted_transactions.csv
- Cleared Transactions bids:** cleared_transactions.csv
- FTR file:** ftrs.csv
- PAR Limits:** par_limits.csv
- Contingency Definitions data (*.aux format):** contingency.aux
- Static EMS model (*.aux format):** network_model.aux
- Flowgates and Generic Constraints:** interface_generic.aux
- Outage and MOI Overrides:** Outage_Override.csv

Simulator Data:

- Static EMS model (*.aux format):** network_model.aux
- Flowgates and Generic Constraints:** interface_generic.aux
- Outage and MOI Overrides:** Outage_Override.csv

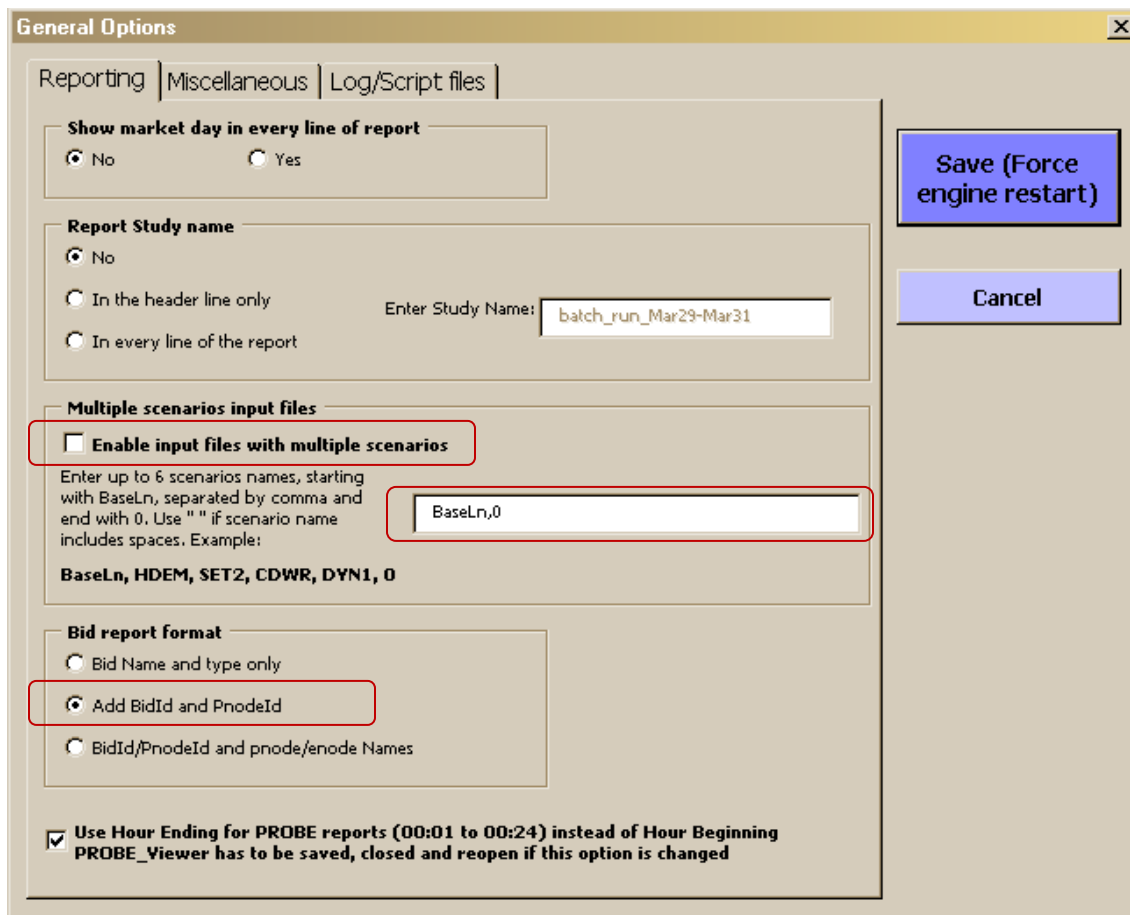
Right Panel:

- Select Mode:**
 - ☒ Look Ahead
 - ☐ Look Back and Viewer
 - ☐ RAA
- ☐ Enforce Engine Restart
- Buttons:** Cancel, Exit, Clear All Sheets (Save Formats), Export Scenario Settings, Import Scenario Settings, Select Hours
- Options:** (Circled in red)
- ☐ Keep previous reports
- ☒ Move left

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1. Reporting Tab

SET selections as shown. If it is desired to use multiple scenarios, ENTER scenario names and CHECK the box.



General Options

Reporting | Miscellaneous | Log/Script files

Show market day in every line of report

☒ No ☐ Yes

Report Study name

☒ No

☐ In the header line only Enter Study Name:

☐ In every line of the report

Multiple scenarios input files

☒ **Enable input files with multiple scenarios**

Enter up to 6 scenarios names, starting with BaseLn, separated by comma and end with 0. Use " " if scenario name includes spaces. Example:

BaseLn, HDEM, SET2, CDWR, DYN1, 0

Bid report format

☐ Bid Name and type only


☒ Add BidId and PnodeId

☐ BidId/PnodeId and pnode/enode Names

☒ **Use Hour Ending for PROBE reports (00:01 to 00:24) instead of Hour Beginning**
PROBE_Vviewer has to be saved, closed and reopen if this option is changed

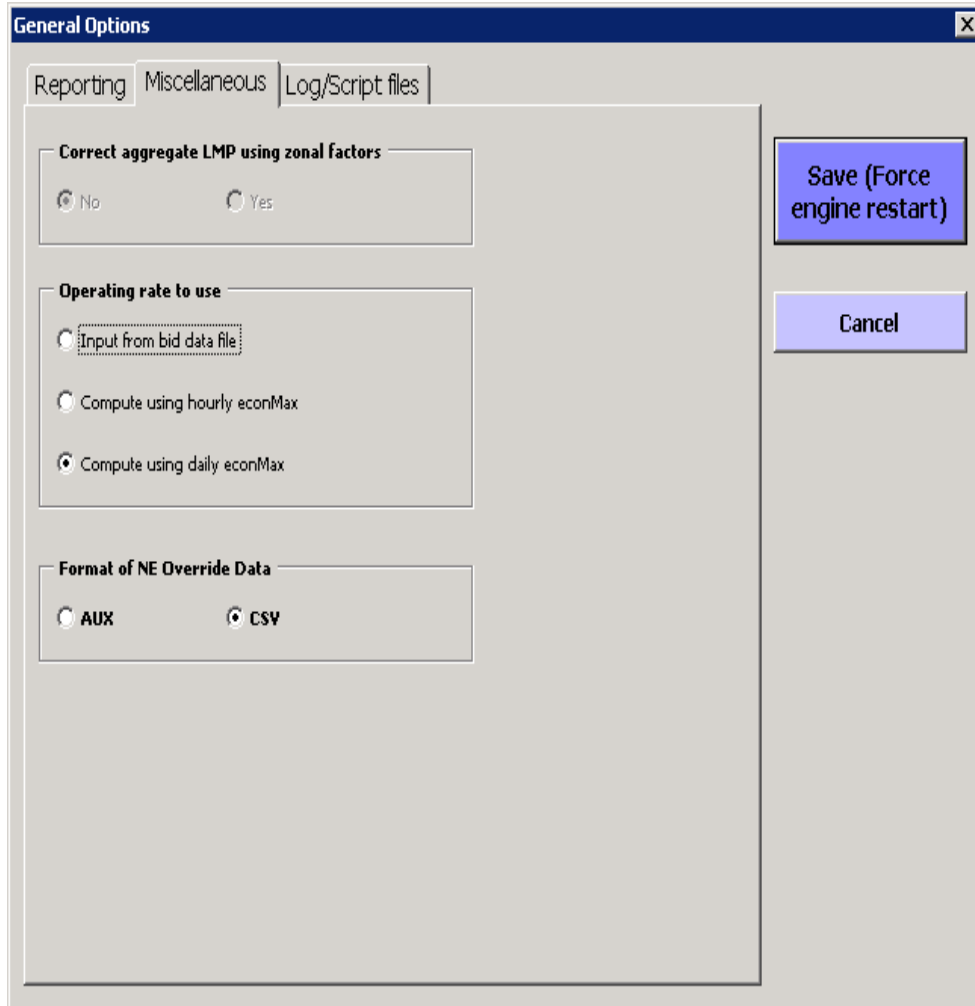
Save (Force engine restart)

Cancel

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2. Miscellaneous Tab

SET selections as shown.



General Options

Reporting | **Miscellaneous** | Log/Script files

Correct aggregate LMP using zonal factors

☐ No ☐ Yes

Operating rate to use


☐ Input from bid data file
☐ Compute using hourly econMax
☒ Compute using daily econMax

Format of NE Override Data

☒ AUX ☐ CSV

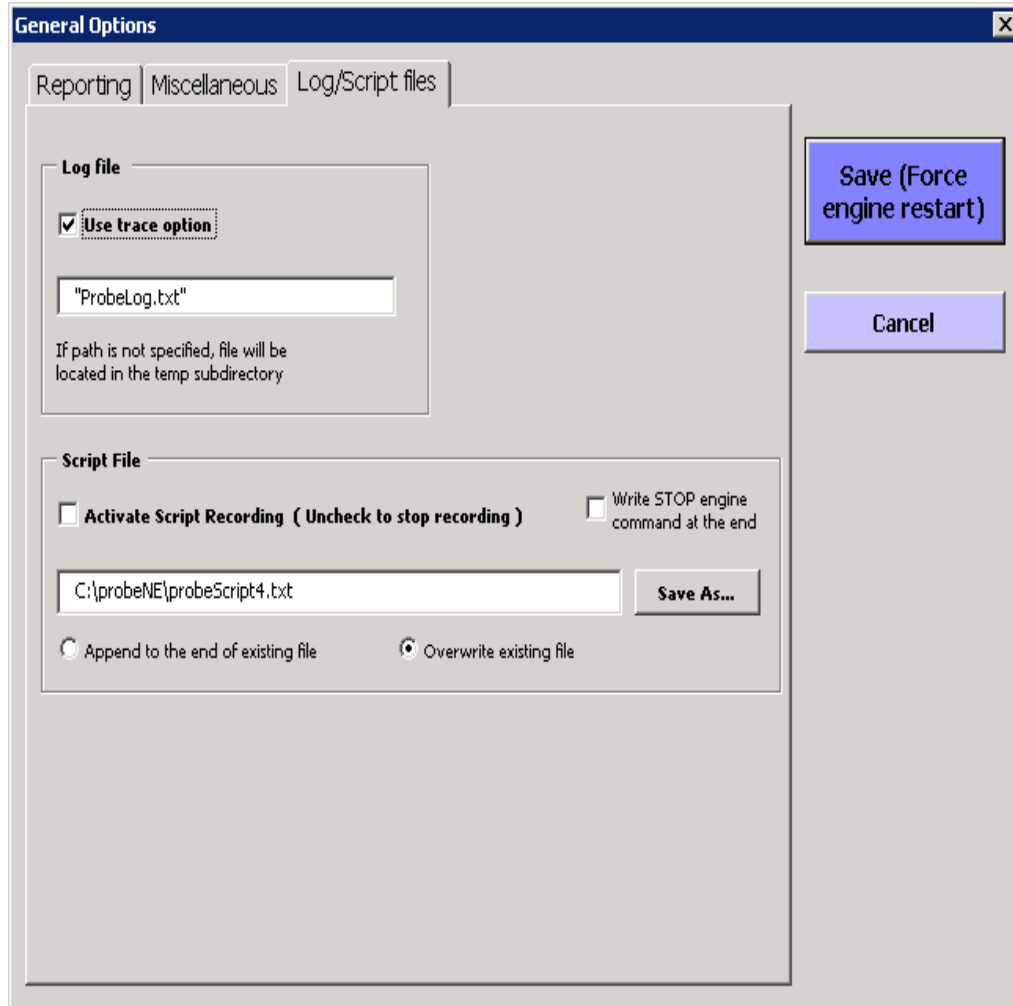
Save (Force engine restart)

Cancel

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3. Log/Script files Tab

SET selections as shown.



General Options

Reporting | Miscellaneous | **Log/Script files**

Log file

☒ **Use trace option**

"ProbeLog.txt"

If path is not specified, file will be located in the temp subdirectory

Script File


☐ **Activate Script Recording (Uncheck to stop recording)** ☐ **Write STOP engine command at the end**

C:\probeNE\probeScript4.txt **Save As...**

☐ Append to the end of existing file ☒ Overwrite existing file

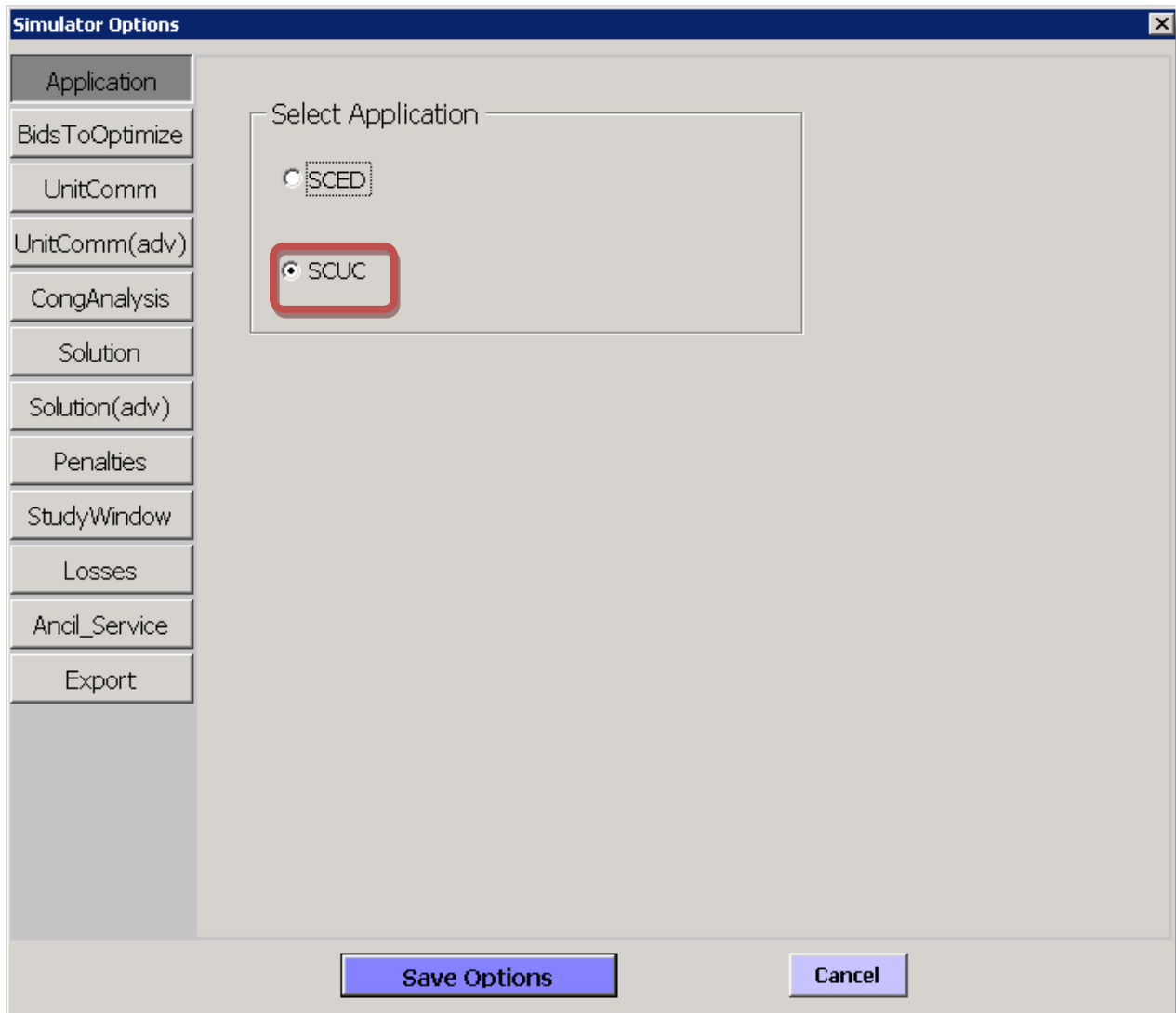
Save (Force engine restart)

Cancel

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4. Application Tab

- a. SET to SCUC (Security Constrained Unit Commitment) for unit commitment from scratch



Simulator Options

Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export


Select Application

☐ SCED

☒ SCUC

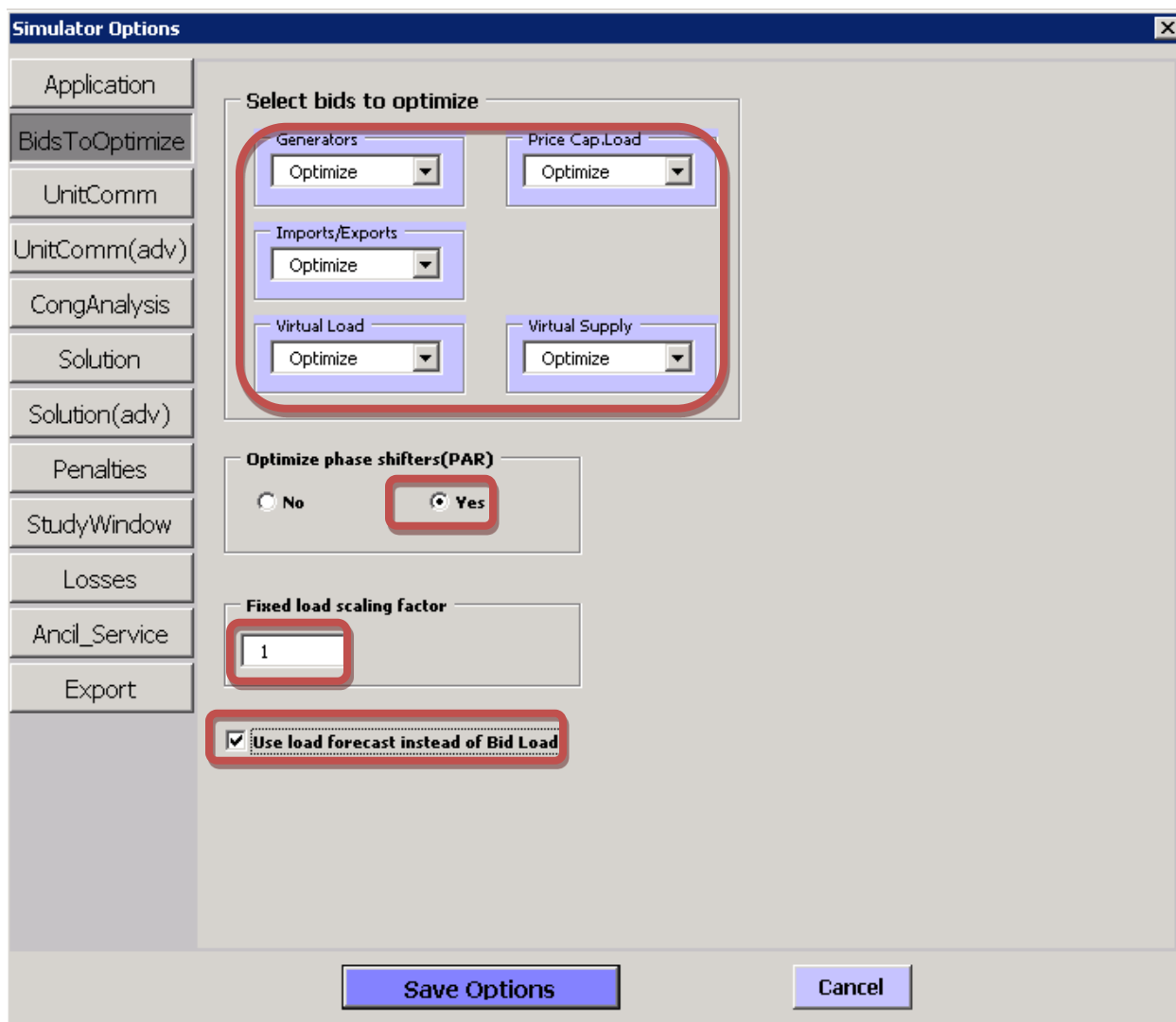
Save Options

Cancel

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5. Bids ToOptimize tab

- SET “Select bids to optimize” to “Optimize”
- SET Optimize phase shifters(PAR) to “Yes”
- SET “Fixed load scaling factor” to “1” to account for losses as the load forecast includes them but it is desired that PROBE calculates marginal losses separately
- SELECT “Use load forecast instead of Bid Load”



Simulator Options

Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

Select bids to optimize

Generators: Optimize

Price Cap.Load: Optimize

Imports/Exports: Optimize

Virtual Load: Optimize

Virtual Supply: Optimize

Optimize phase shifters(PAR)

☐ No ☒ Yes

Fixed load scaling factor


1

☒ Use load forecast instead of Bid Load

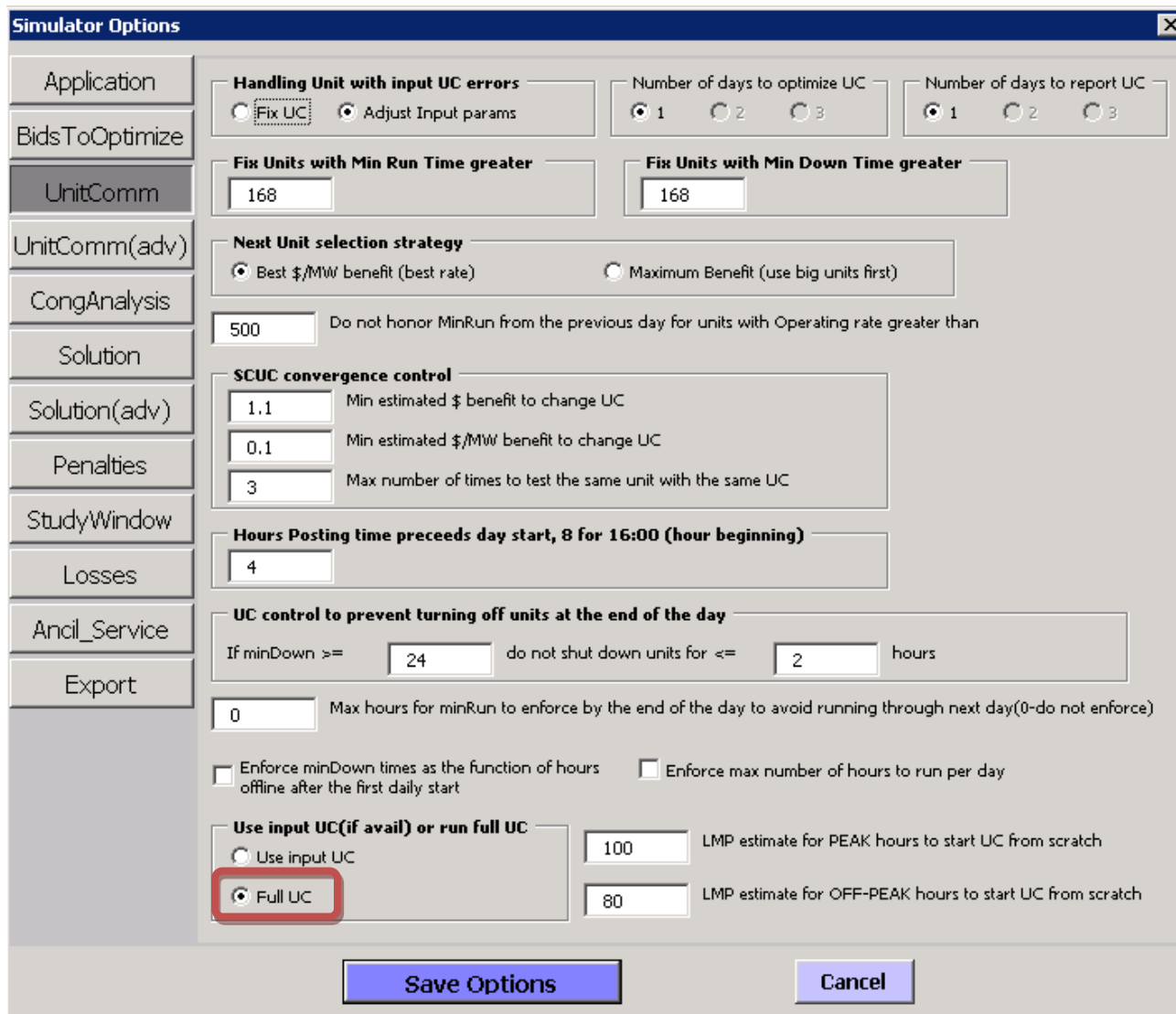
Save Options Cancel

6. UnitComm tab

- SELECT “Full UC” to perform unit commitment from scratch.

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- b. Verify all other settings are as shown below. Adjustments may be made as analysis shows that this may be necessary.



Simulator Options

Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

Handling Unit with input UC errors

☐ Fix UC ☒ Adjust Input params

Number of days to optimize UC

☒ 1 ☐ 2 ☐ 3

Number of days to report UC

☒ 1 ☐ 2 ☐ 3

Fix Units with Min Run Time greater

168

Fix Units with Min Down Time greater

168

Next Unit selection strategy

☒ Best \$/MW benefit (best rate) ☐ Maximum Benefit (use big units first)

500 Do not honor MinRun from the previous day for units with Operating rate greater than

SCUC convergence control

1.1 Min estimated \$ benefit to change UC

0.1 Min estimated \$/MW benefit to change UC

3 Max number of times to test the same unit with the same UC

Hours Posting time precedes day start, 8 for 16:00 (hour beginning)

4

UC control to prevent turning off units at the end of the day

If minDown >= 24 do not shut down units for <= 2 hours

0 Max hours for minRun to enforce by the end of the day to avoid running through next day(0-do not enforce)

☐ Enforce minDown times as the function of hours offline after the first daily start ☐ Enforce max number of hours to run per day

Use input UC(if avail) or run full UC

☐ Use input UC ☒ Full UC


100 LMP estimate for PEAK hours to start UC from scratch

80 LMP estimate for OFF-PEAK hours to start UC from scratch

Save Options **Cancel**

7. UnitComm(adv) tab

- a. SELECT "Include start up cost for all hours"

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Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

Accounting for Start-Up Cost for Must Run (self-scheduled) generators

☒ Include start up cost for all hours

☐ Do not include start up cost for hours with Must Run status only


☐ Do not include start up cost for all hours if at least one hour has Must Run

☐ Do not include start up cost for Must Run hours and all preceding hours unless unit stopped

This logic is not applied for units with status S - must run by the operator

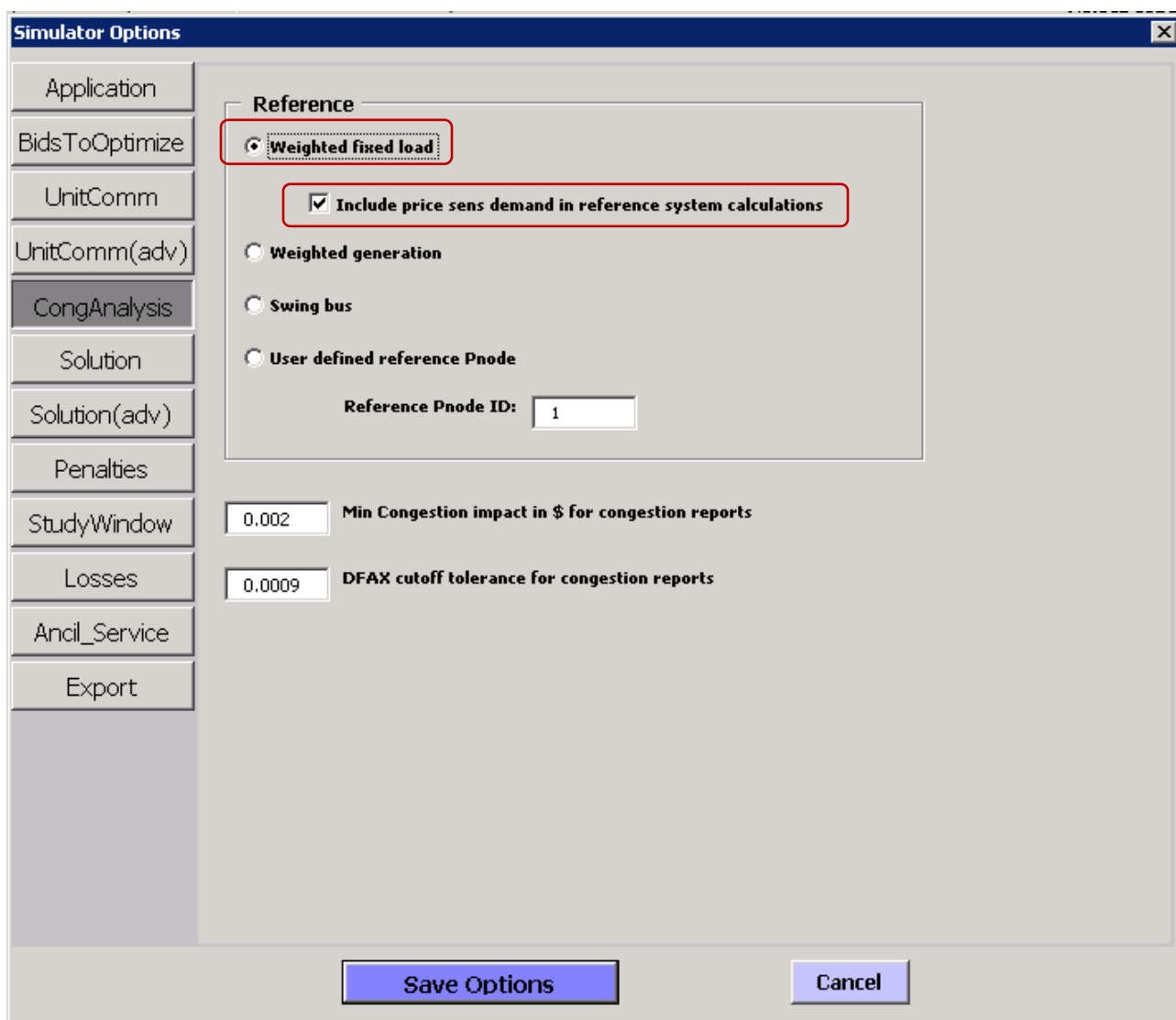
Save Options

Cancel

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8. CongAnalysis tab

- a. SELECT “Weighted fixed load” and SELECT “Include price sens demand in reference system calculations”
- b. All other selection inputs should be as seen below



Simulator Options

Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

Reference

☒ **Weighted fixed load**

☒ **Include price sens demand in reference system calculations**

☐ **Weighted generation**

☐ **Swing bus**


☐ **User defined reference Pnode**

Reference Pnode ID: 1

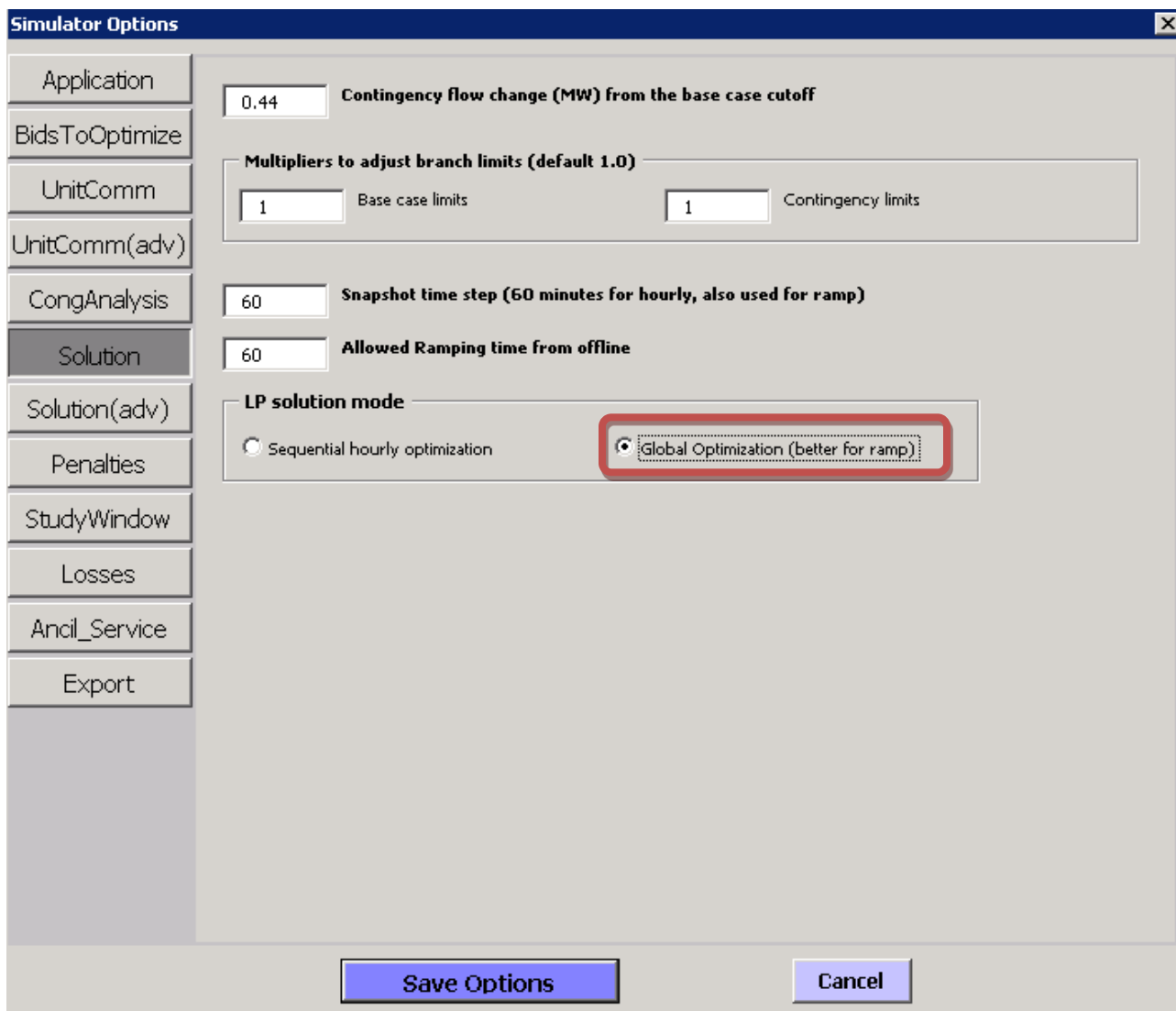
0.002 **Min Congestion impact in \$ for congestion reports**

0.0009 **DFAX cutoff tolerance for congestion reports**

Save Options **Cancel**

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9. Solution tab
 - a. SELECT “Global Optimization” (better for ramping Resources)
 - b. All other selection inputs should be as shown below



Simulator Options

Application: 0.44 Contingency flow change (MW) from the base case cutoff

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

Multipliers to adjust branch limits (default 1.0)

1 Base case limits 1 Contingency limits


60 Snapshot time step (60 minutes for hourly, also used for ramp)

60 Allowed Ramping time from offline

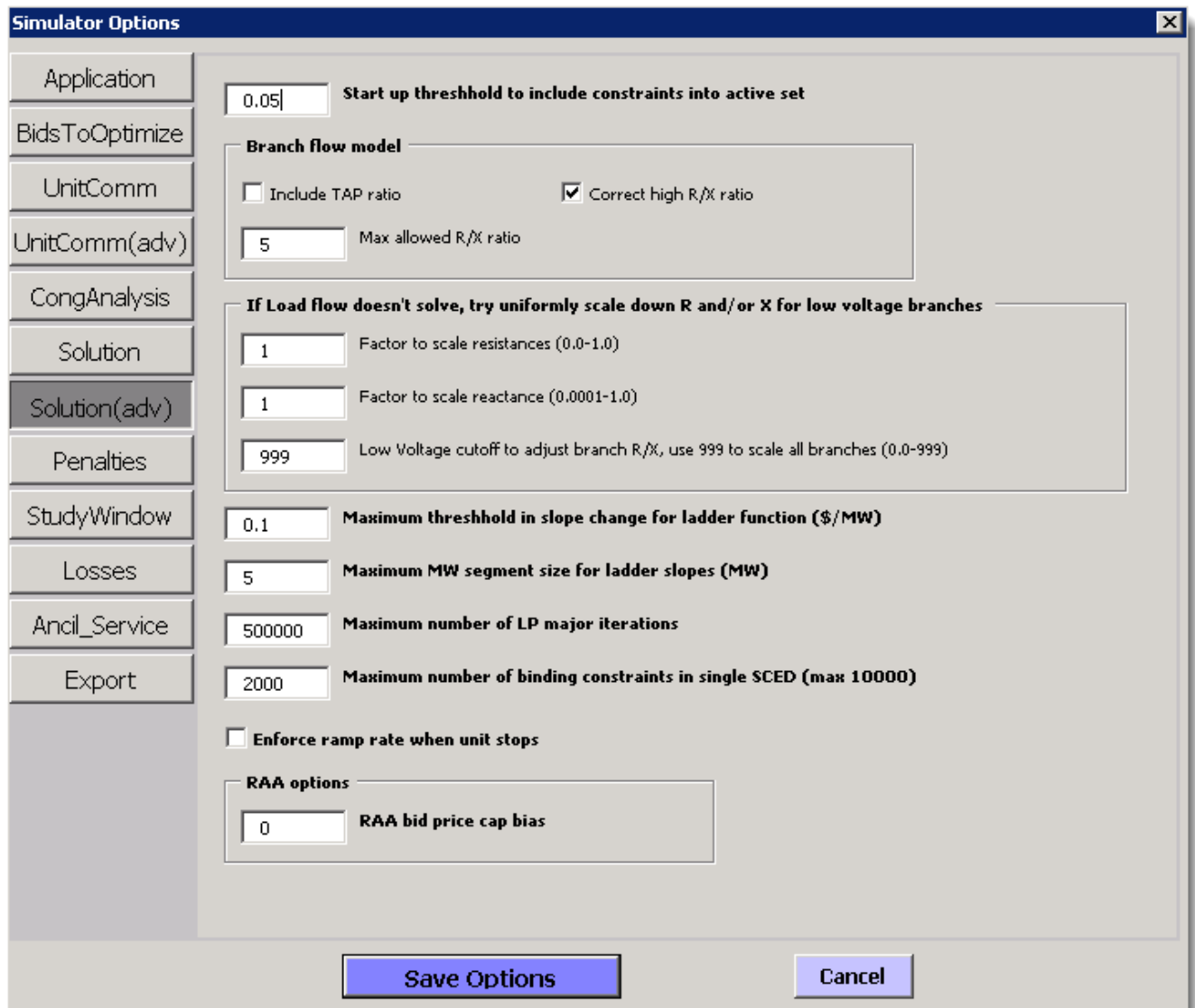
LP solution mode

☐ Sequential hourly optimization ☒ Global Optimization (better for ramp)

Save Options Cancel

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10. Solution(adv) tab
 - a. SET options as shown below



Simulator Options

Application: 0.05 | Start up threshold to include constraints into active set

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

Branch flow model

☐ Include TAP ratio ☒ Correct high R/X ratio

5 | Max allowed R/X ratio

If Load flow doesn't solve, try uniformly scale down R and/or X for low voltage branches

1 | Factor to scale resistances (0.0-1.0)

1 | Factor to scale reactance (0.0001-1.0)

999 | Low Voltage cutoff to adjust branch R/X, use 999 to scale all branches (0.0-999)

0.1 | Maximum threshold in slope change for ladder function (\$/MW)

5 | Maximum MW segment size for ladder slopes (MW)

500000 | Maximum number of LP major iterations


2000 | Maximum number of binding constraints in single SCED (max 10000)

☐ Enforce ramp rate when unit stops

RAA options

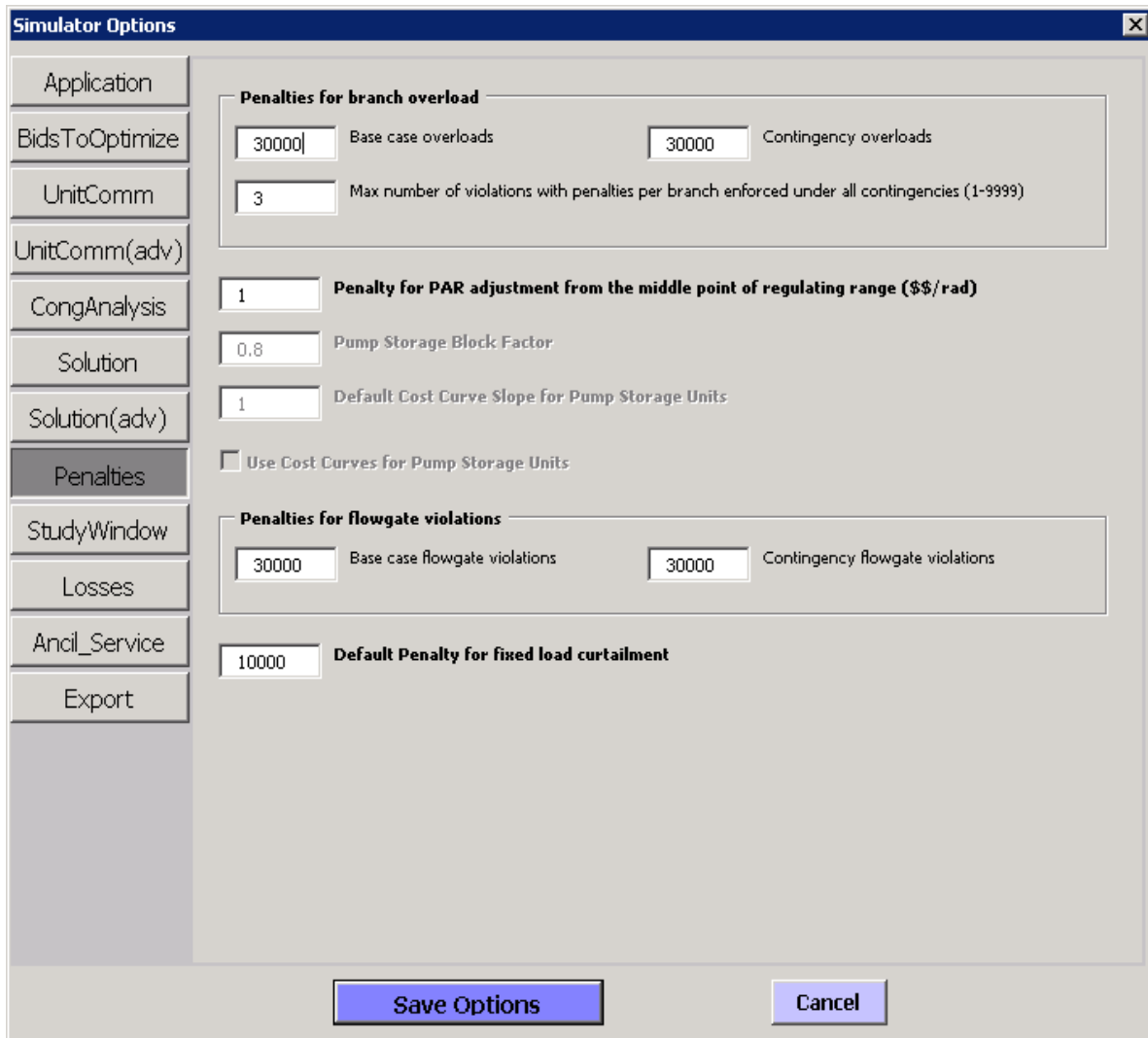
0 | RAA bid price cap bias

Save Options Cancel

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11. Penalties tab

a. USE default values as shown below



Simulator Options

Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

Penalties for branch overload

30000 Base case overloads 30000 Contingency overloads

3 Max number of violations with penalties per branch enforced under all contingencies (1-9999)

1 **Penalty for PAR adjustment from the middle point of regulating range (\$\$/rad)**

0.8 Pump Storage Block Factor

1 Default Cost Curve Slope for Pump Storage Units


☐ Use Cost Curves for Pump Storage Units

Penalties for flowgate violations

30000 Base case flowgate violations 30000 Contingency flowgate violations

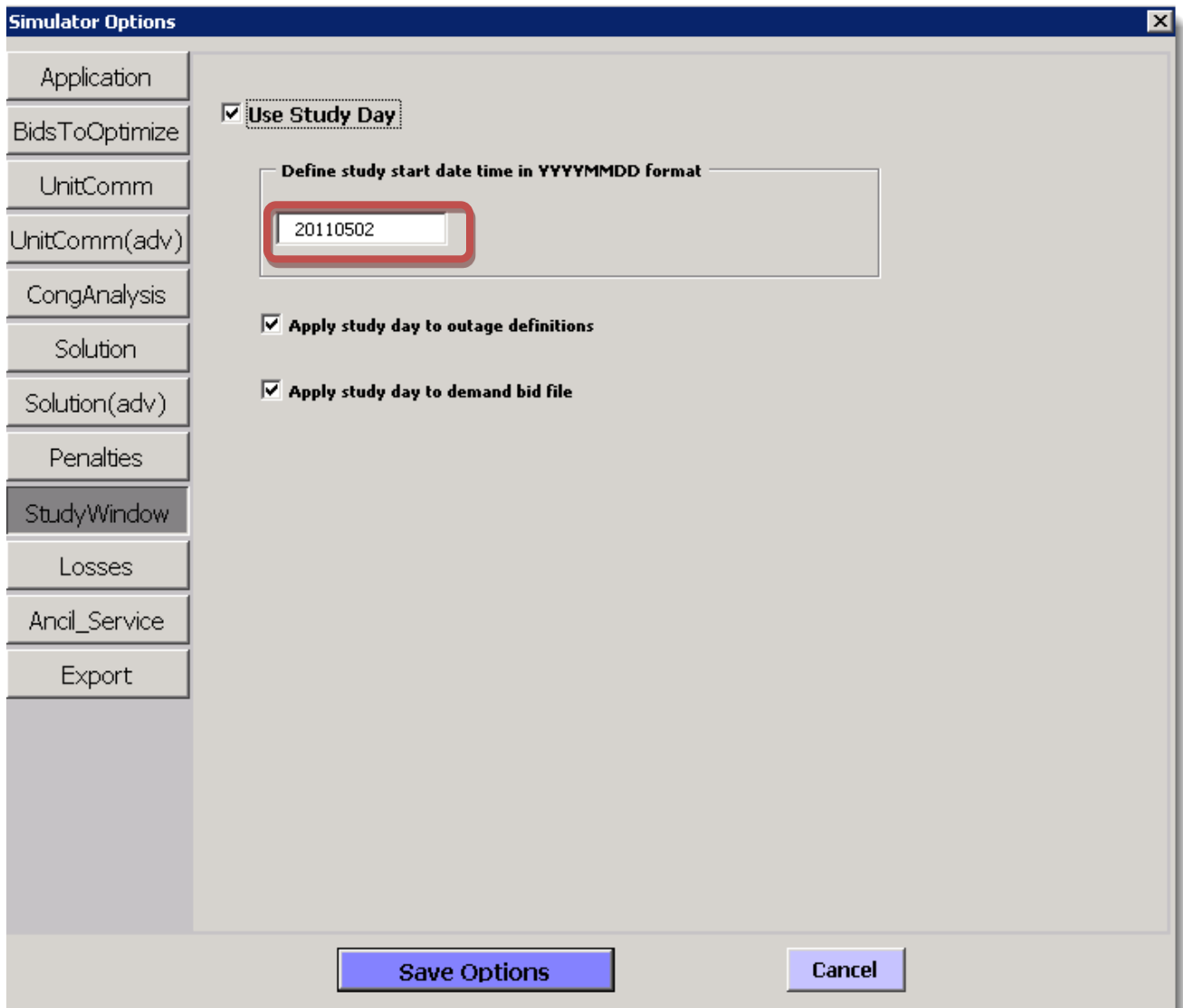
10000 **Default Penalty for fixed load curtailment**

Save Options Cancel

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12. StudyWindow tab

- a. CHECK all selections and SET “Define study start-date....” to future study-date or first future study-date if performing multi-day runs



Simulator Options

Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

☒ **Use Study Day**


Define study start date time in YYYYMMDD format

20110502

☒ **Apply study day to outage definitions**

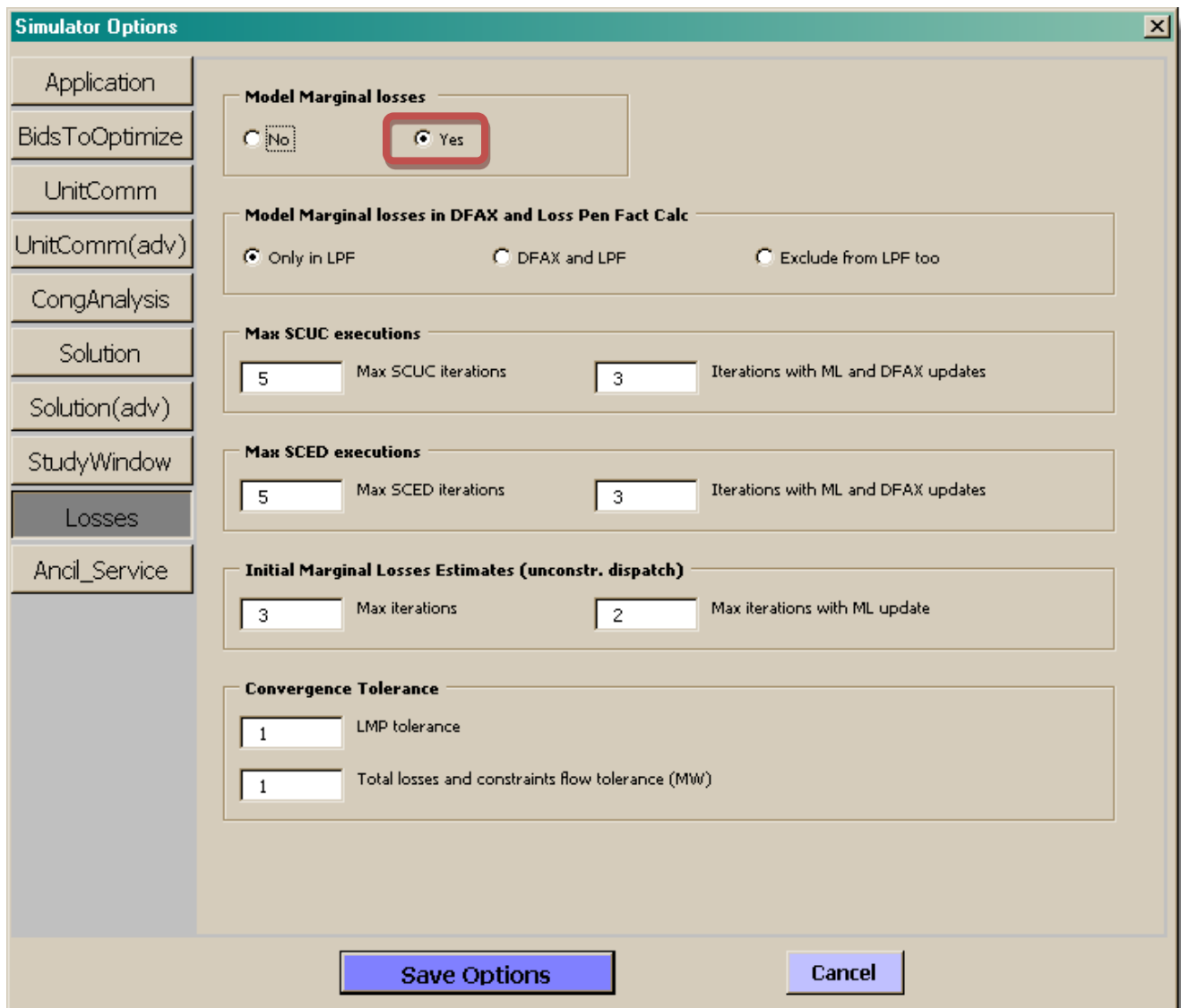
☒ **Apply study day to demand bid file**

Save Options **Cancel**

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis Revision Number: 9 Effective Date: October 26, 2022 Valid Through: October 26, 2024
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	
	Procedure Owner: Andrew Kopacka	
	Approved By: Director, Operations Support Services	

13. Losses

- SET "Model Marginal losses" to "Yes"
- CHECK "Only in LPF"
- Other settings should be set as shown below



Simulator Options

Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

StudyWindow

Losses

Ancil_Service

Model Marginal losses

☐ No ☒ Yes

Model Marginal losses in DFAX and Loss Pen Fact Calc

☒ Only in LPF ☐ DFAX and LPF ☐ Exclude from LPF too

Max SCUC executions

Max SCUC iterations Iterations with ML and DFAX updates

Max SCED executions

Max SCED iterations Iterations with ML and DFAX updates

Initial Marginal Losses Estimates (unconstr. dispatch)


Max iterations Max iterations with ML update

Convergence Tolerance

LMP tolerance

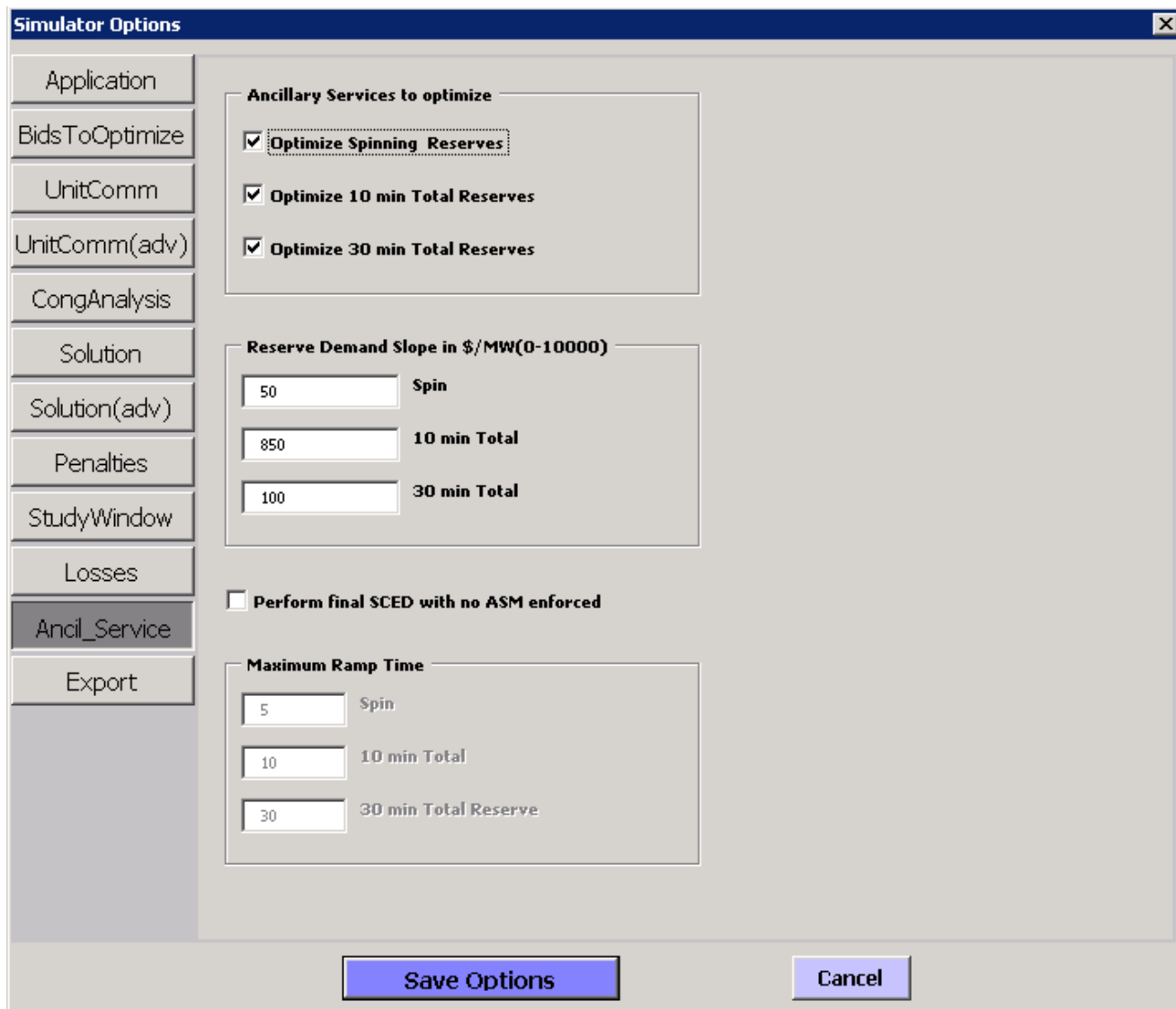
Total losses and constraints flow tolerance (MW)

Save Options **Cancel**

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
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14. Ancil_Service tab

- a. If it is desired to model unit commitment for reserves, CHECK all selections for Day-Ahead simulation. UNCHECK "Perform final SCED with **no** ASM enforced" for Real-Time simulation. UNCHECK all if **not** respecting reserve requirements in unit commitment



Simulator Options

Ancillary Services to optimize

- ☒ Optimize Spinning Reserves
- ☒ Optimize 10 min Total Reserves
- ☒ Optimize 30 min Total Reserves

Reserve Demand Slope in \$/MW(0-10000)

50 Spin

850 10 min Total

100 30 min Total

☐ Perform final SCED with no ASM enforced


Maximum Ramp Time

5 Spin

10 10 min Total

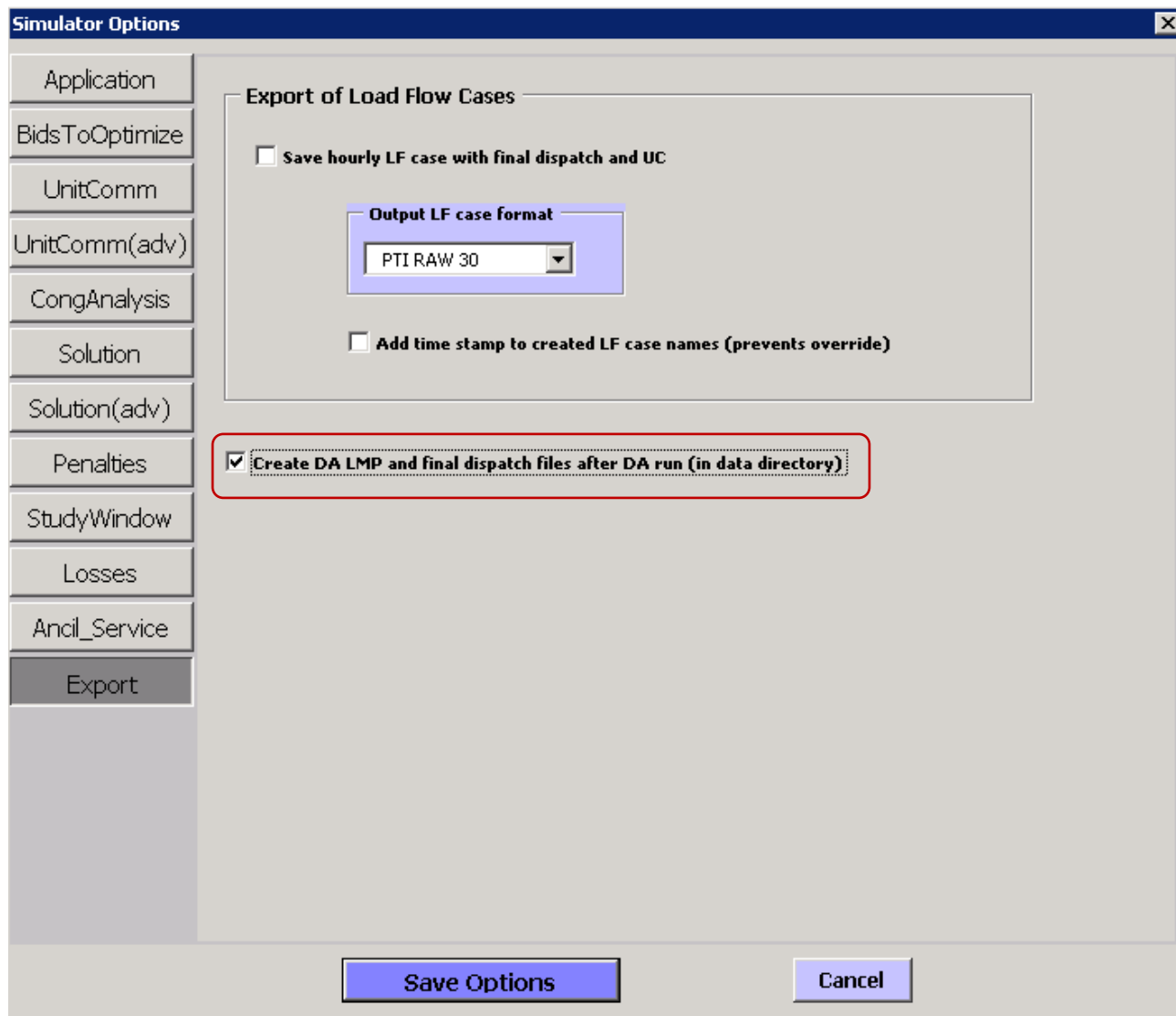
30 30 min Total Reserve

Save Options **Cancel**

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

15. Export tab

- a. If it is desired to export hourly load flow models, SELECT the desired format and check boxes.
- b. CHECK “Create DA LMP and final dispatch files after DA run”



Simulator Options

Application

BidsToOptimize

UnitComm

UnitComm(adv)

CongAnalysis

Solution

Solution(adv)

Penalties

StudyWindow

Losses

Ancil_Service

Export

Export of Load Flow Cases

☐ Save hourly LF case with final dispatch and UC

Output LF case format


PTI RAW 30

☐ Add time stamp to created LF case names (prevents override)

☒ **Create DA LMP and final dispatch files after DA run (in data directory)**

Save Options

Cancel

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

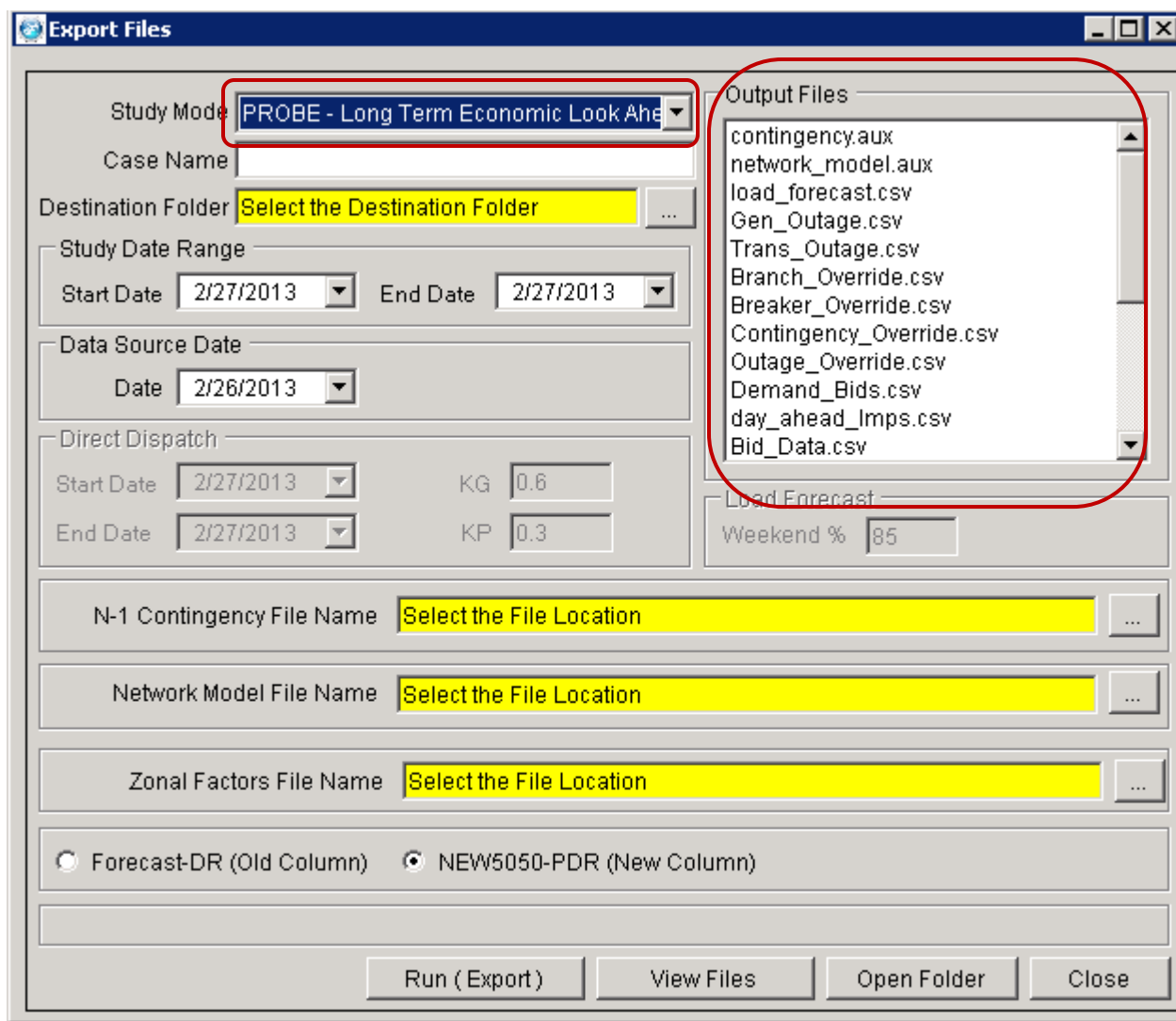
Attachment C - Casebuilder Set-up and Operation

The following screens and steps describe the setup and operation of the Casebuilder application.

NOTE

The Casebuilder application provides input files for both TARA and PROBE applications and for various study modes. The input files produced are custom for the study mode selected.

1. SELECT “PROBE – Long Term Economic Look Ahead” Study Mode. The resulting output files are displayed in the box on the right.



Export Files

Study Mode: **PROBE - Long Term Economic Look Ahead**

Case Name:

Destination Folder: **Select the Destination Folder**

Study Date Range

Start Date: 2/27/2013 End Date: 2/27/2013

Data Source Date

Date: 2/26/2013

Direct Dispatch

Start Date: 2/27/2013 KG: 0.6

End Date: 2/27/2013 KP: 0.3

Output Files

- contingency.aux
- network_model.aux
- load_forecast.csv
- Gen_Outage.csv
- Trans_Outage.csv
- Branch_Override.csv
- Breaker_Override.csv
- Contingency_Override.csv
- Outage_Override.csv
- Demand_Bids.csv
- day_ahead_lmps.csv
- Bid_Data.csv

Load Forecast

Weekend %: 85


N-1 Contingency File Name: **Select the File Location**

Network Model File Name: **Select the File Location**

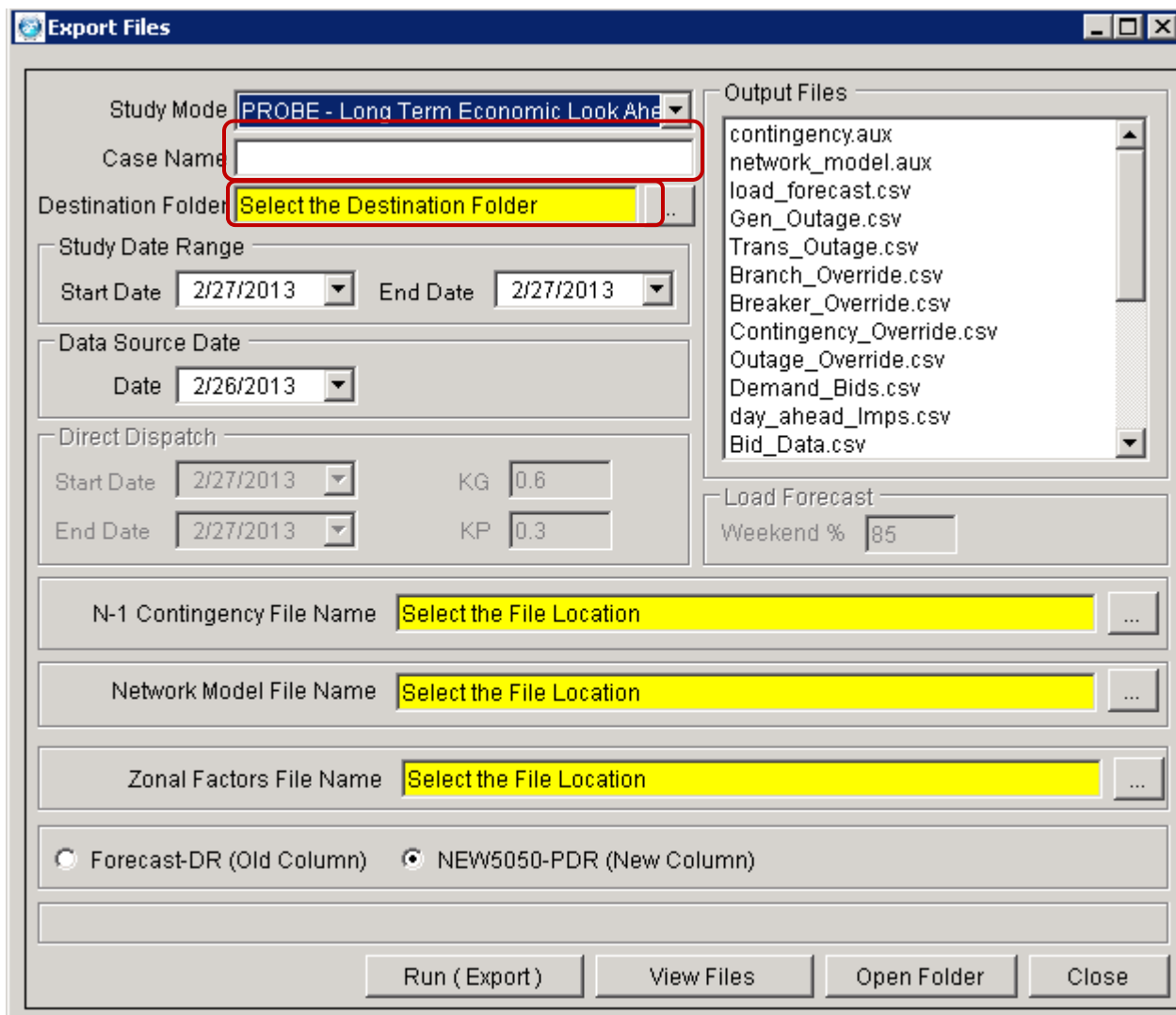
Zonal Factors File Name: **Select the File Location**

☐ Forecast-DR (Old Column) ☒ NEW5050-PDR (New Column)

Run (Export) View Files Open Folder Close

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

2. DEFINE “Case Name” and “Destination Folder”. The selected study-dates will be automatically appended to the resulting folder. If more than one (1) study-date is selected, there will be a folder for each study-day.



Export Files

Study Mode: **PROBE - Long Term Economic Look Ahead**

Case Name:

Destination Folder: **Select the Destination Folder**

Study Date Range
 Start Date: 2/27/2013 End Date: 2/27/2013

Data Source Date
 Date: 2/26/2013

Direct Dispatch
 Start Date: 2/27/2013 KG: 0.6
 End Date: 2/27/2013 KP: 0.3

Output Files
 contingency.aux
 network_model.aux
 load_forecast.csv
 Gen_Outage.csv
 Trans_Outage.csv
 Branch_Override.csv
 Breaker_Override.csv
 Contingency_Override.csv
 Outage_Override.csv
 Demand_Bids.csv
 day_ahead_lmps.csv
 Bid_Data.csv

Load Forecast
 Weekend %: 85


N-1 Contingency File Name: **Select the File Location**

Network Model File Name: **Select the File Location**

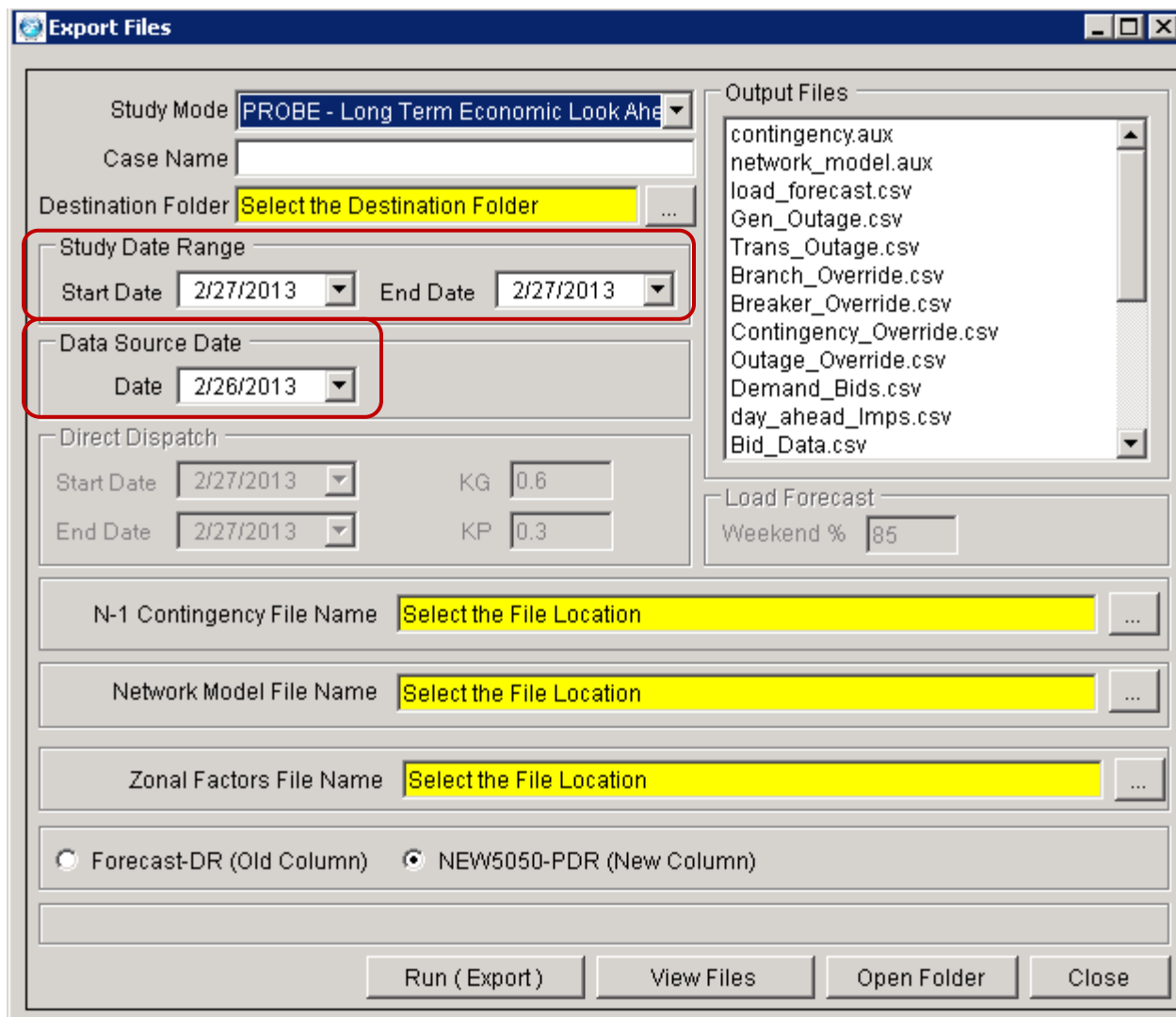
Zonal Factors File Name: **Select the File Location**

☐ Forecast-DR (Old Column) ☒ NEW5050-PDR (New Column)

Run (Export) View Files Open Folder Close

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

3. DEFINE “Study Date Range” and “Data Source Date” (Market Day – used for bids/offers/transactions). The Direct Dispatch selectors are **not** applicable to any of the PROBE study modes, so they are greyed out.



Export Files

Study Mode: **PROBE - Long Term Economic Look Ahead**

Case Name:

Destination Folder: **Select the Destination Folder**

Study Date Range

Start Date: **2/27/2013** End Date: **2/27/2013**

Data Source Date

Date: **2/26/2013**

Direct Dispatch

Start Date: **2/27/2013** KG: **0.6**

End Date: **2/27/2013** KP: **0.3**

Output Files

- contingency.aux
- network_model.aux
- load_forecast.csv
- Gen_Outage.csv
- Trans_Outage.csv
- Branch_Override.csv
- Breaker_Override.csv
- Contingency_Override.csv
- Outage_Override.csv
- Demand_Bids.csv
- day_ahead_lmps.csv
- Bid_Data.csv

Load Forecast

Weekend %: **85**


N-1 Contingency File Name: **Select the File Location**

Network Model File Name: **Select the File Location**

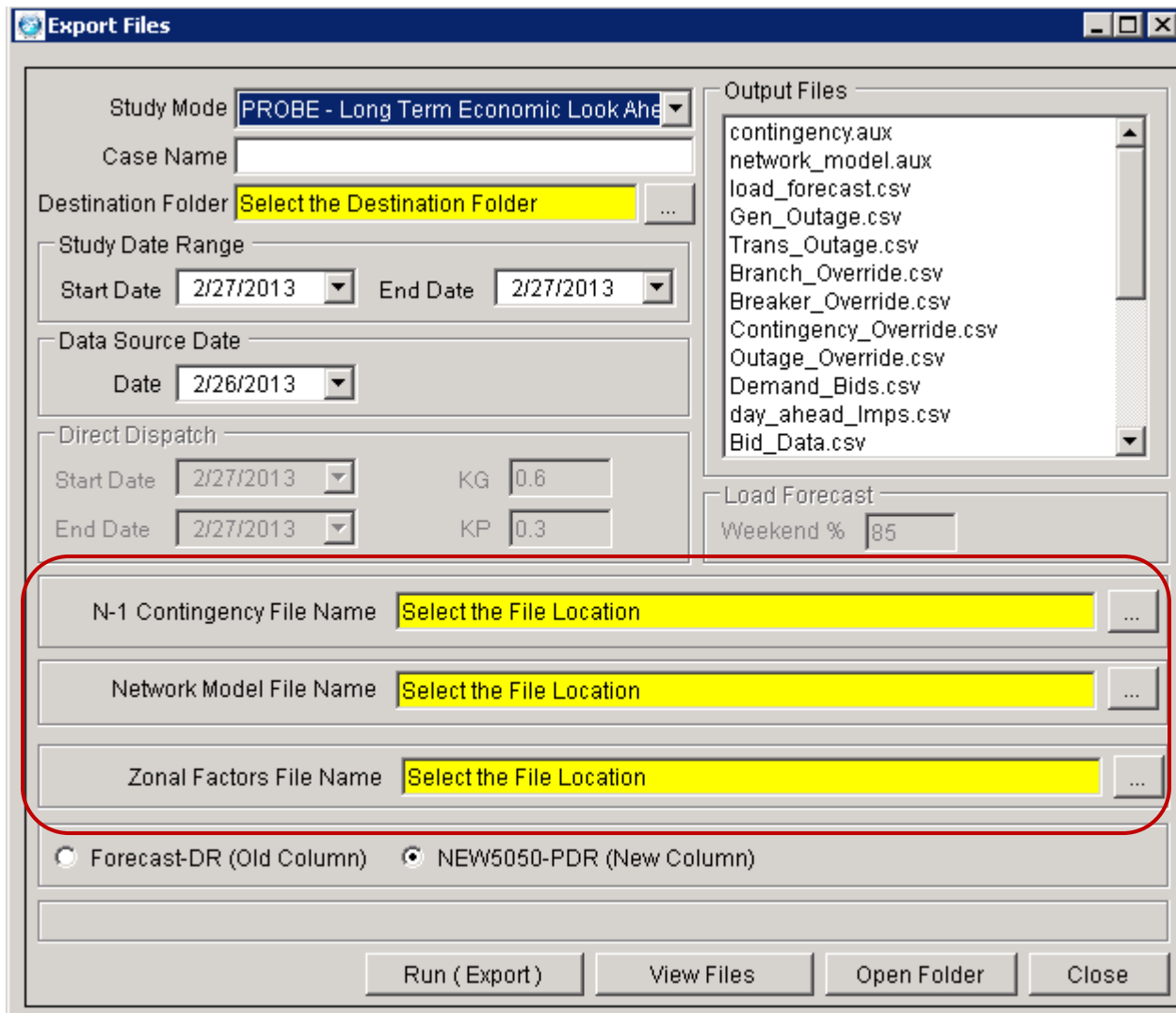
Zonal Factors File Name: **Select the File Location**

☐ Forecast-DR (Old Column) ☒ NEW5050-PDR (New Column)

Run (Export) **View Files** **Open Folder** **Close**

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

4. SELECT “N-1 Contingency File”, “Network Model File Name” and “Zonal Factors File Name”. Casebuilder will open the \\rtsmb\PowerWorld\Export folder where these files are saved when created from EMS. The zonal factors file should be chosen to match the month of the study-dates and are located in the casebuilder_manual_files folder.



Export Files

Study Mode: **PROBE - Long Term Economic Look Ahead**

Case Name:

Destination Folder: **Select the Destination Folder** ...

Study Date Range

Start Date: **2/27/2013** End Date: **2/27/2013**

Data Source Date

Date: **2/26/2013**

Direct Dispatch

Start Date: **2/27/2013** KG: **0.6**

End Date: **2/27/2013** KP: **0.3**

Output Files

- contingency.aux
- network_model.aux
- load_forecast.csv
- Gen_Outage.csv
- Trans_Outage.csv
- Branch_Override.csv
- Breaker_Override.csv
- Contingency_Override.csv
- Outage_Override.csv
- Demand_Bids.csv
- day_ahead_lmps.csv
- Bid_Data.csv

Load Forecast

Weekend %: **85**


N-1 Contingency File Name **Select the File Location** ...

Network Model File Name **Select the File Location** ...

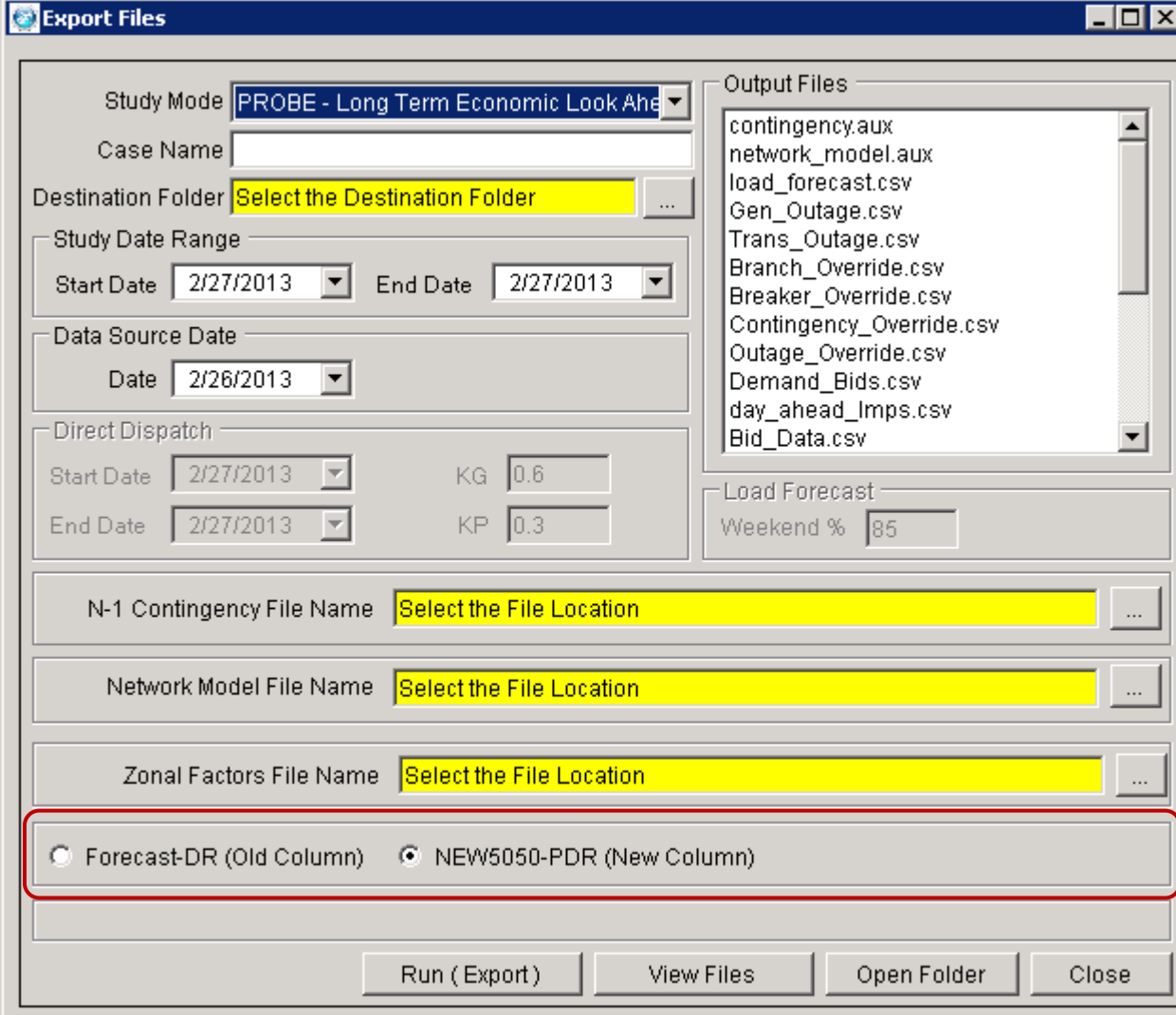
Zonal Factors File Name **Select the File Location** ...

☐ Forecast-DR (Old Column) ☒ NEW5050-PDR (New Column)

Run (Export) **View Files** **Open Folder** **Close**

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

5. SELECT the appropriate Forecast data source.



Export Files

Study Mode: **PROBE - Long Term Economic Look Ahead**

Case Name:

Destination Folder: **Select the Destination Folder**

Study Date Range

Start Date: **2/27/2013** End Date: **2/27/2013**

Data Source Date

Date: **2/26/2013**

Direct Dispatch

Start Date: **2/27/2013** KG: **0.6**

End Date: **2/27/2013** KP: **0.3**

Output Files

- contingency.aux
- network_model.aux
- load_forecast.csv
- Gen_Outage.csv
- Trans_Outage.csv
- Branch_Override.csv
- Breaker_Override.csv
- Contingency_Override.csv
- Outage_Override.csv
- Demand_Bids.csv
- day_ahead_lmps.csv
- Bid_Data.csv

Load Forecast

Weekend %: **85**


N-1 Contingency File Name: **Select the File Location**

Network Model File Name: **Select the File Location**

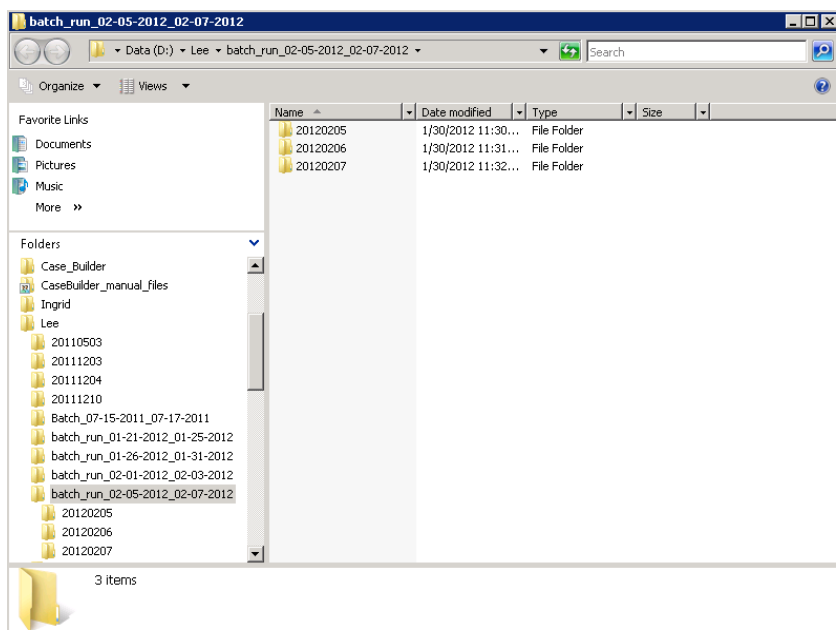
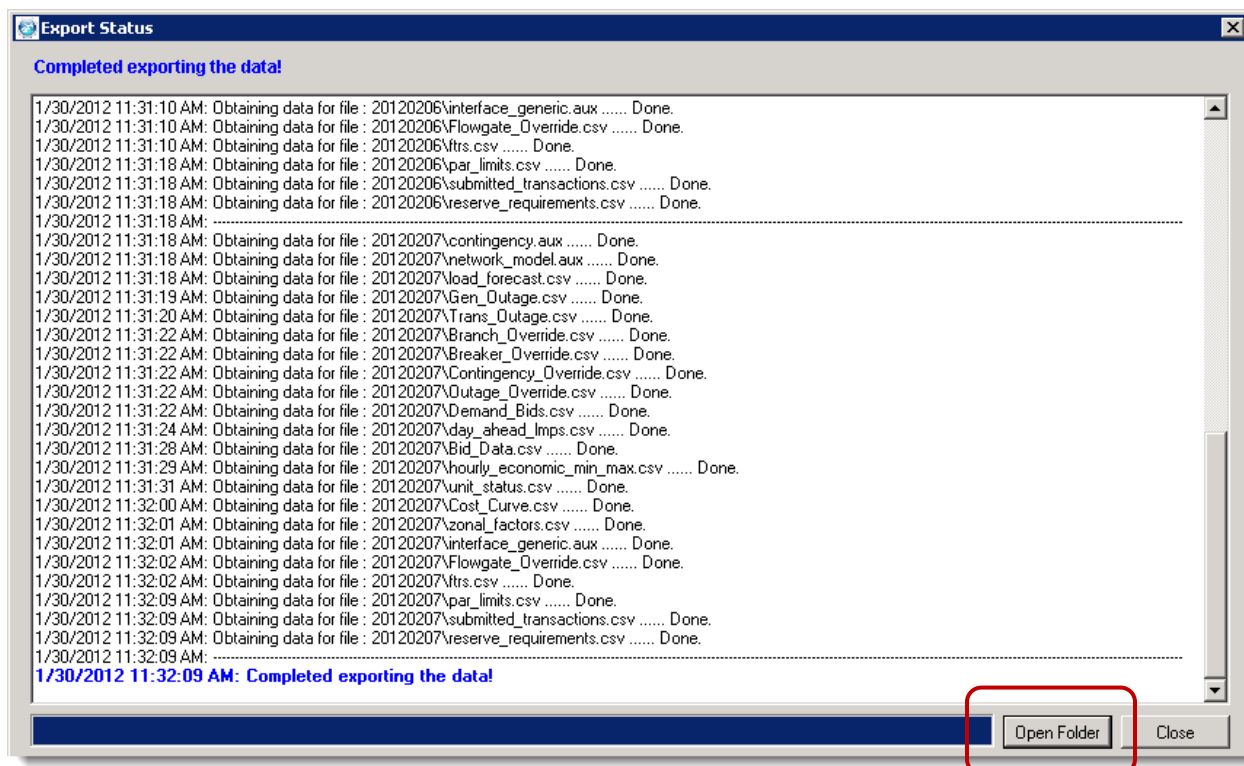
Zonal Factors File Name: **Select the File Location**


☐ Forecast-DR (Old Column) ☒ NEW5050-PDR (New Column)

Run (Export) View Files Open Folder Close

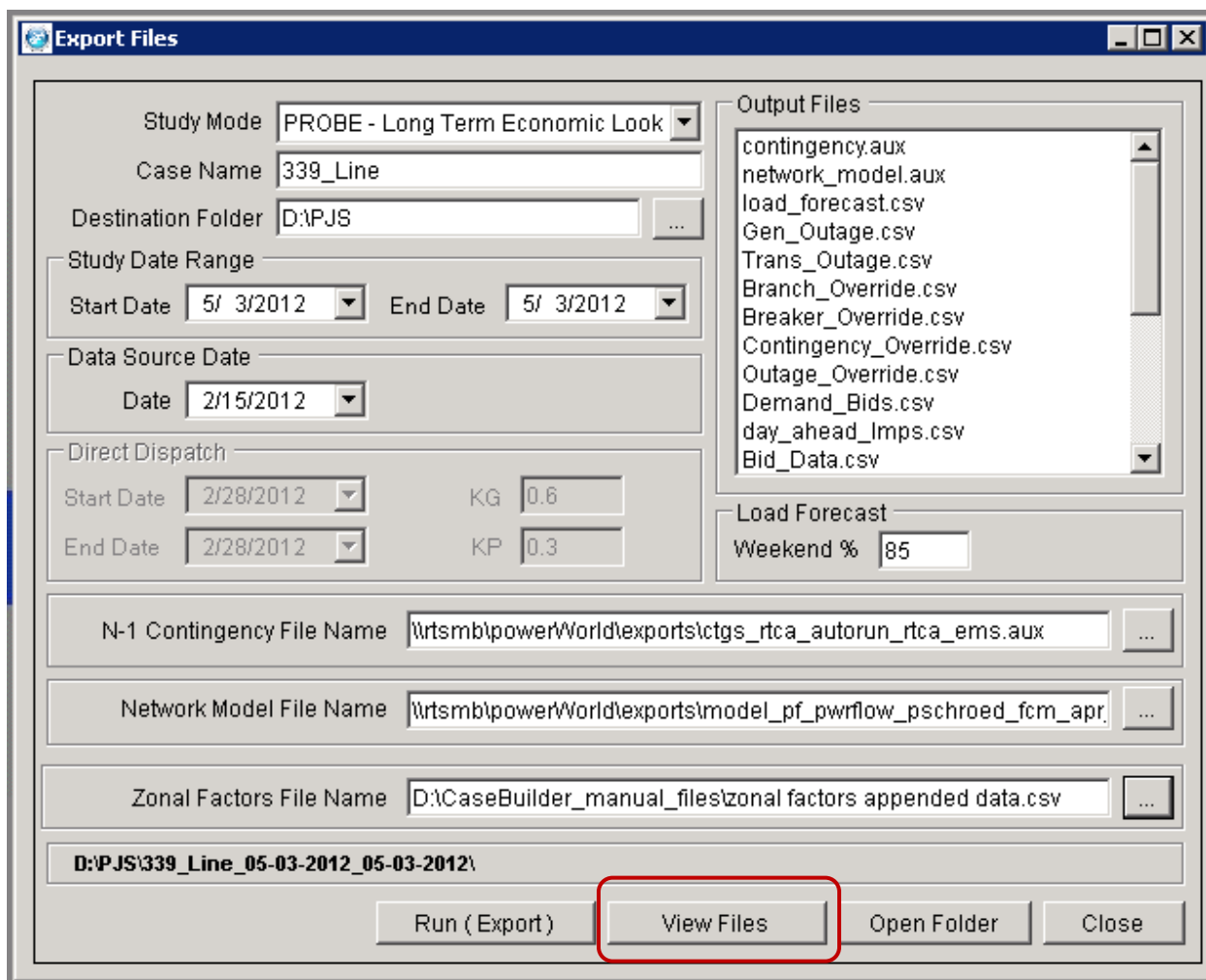
	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

6. CLICK “Run (Export)”. A complete set of input files will be created for each day and a folder will be created for each study-day selected. Clicking “Open Folder” will open the folder.



	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis Revision Number: 9 Effective Date: October 26, 2022 Valid Through: October 26, 2024
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	
	Procedure Owner: Andrew Kopacka	
	Approved By: Director, Operations Support Services	

7. If desired, CLICK “View Files”.



Export Files

Study Mode: PROBE - Long Term Economic Look

Case Name: 339_Line

Destination Folder: D:\PJS

Study Date Range:
 Start Date: 5/ 3/2012 End Date: 5/ 3/2012

Data Source Date:
 Date: 2/15/2012

Direct Dispatch:
 Start Date: 2/28/2012 End Date: 2/28/2012
 KG: 0.6 KP: 0.3

Output Files:

- contingency.aux
- network_model.aux
- load_forecast.csv
- Gen_Outage.csv
- Trans_Outage.csv
- Branch_Override.csv
- Breaker_Override.csv
- Contingency_Override.csv
- Outage_Override.csv
- Demand_Bids.csv
- day_ahead_lmps.csv
- Bid_Data.csv

Load Forecast:
 Weekend %: 85


N-1 Contingency File Name: \\tsmb\power\World\exports\ctgs_rtca_autorun_rtca_ems.aux

Network Model File Name: \\tsmb\power\World\exports\model_pf_pwrflow_pschroed_fcm_apr

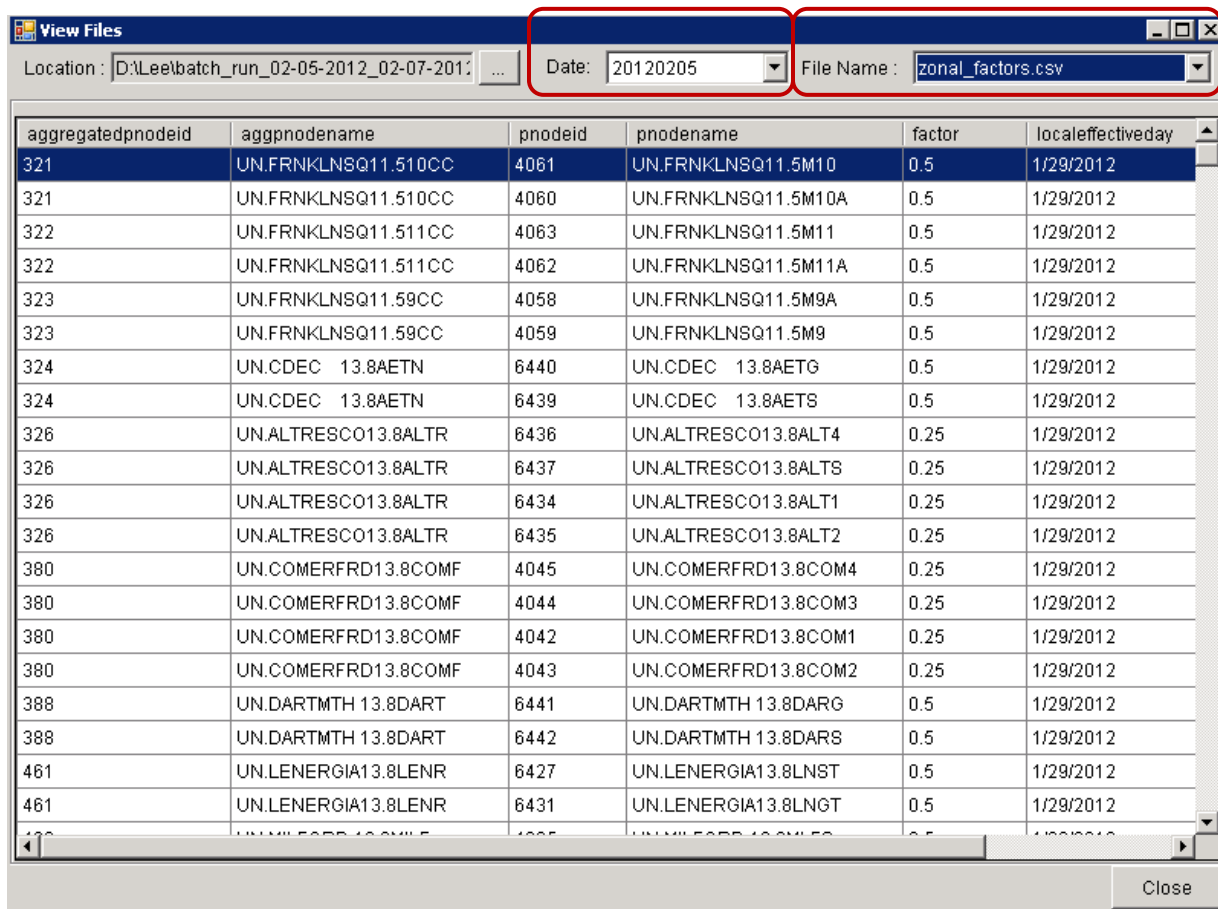
Zonal Factors File Name: D:\CaseBuilder_manual_files\zonal factors appended data.csv

D:\PJS\339_Line_05-03-2012_05-03-2012\


Run (Export) View Files Open Folder Close

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis Revision Number: 9 Effective Date: October 26, 2022 Valid Through: October 26, 2024
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	
	Procedure Owner: Andrew Kopacka	
	Approved By: Director, Operations Support Services	

8. SET “Date” (for multi-day batch runs) and the “File Name” to view each file.



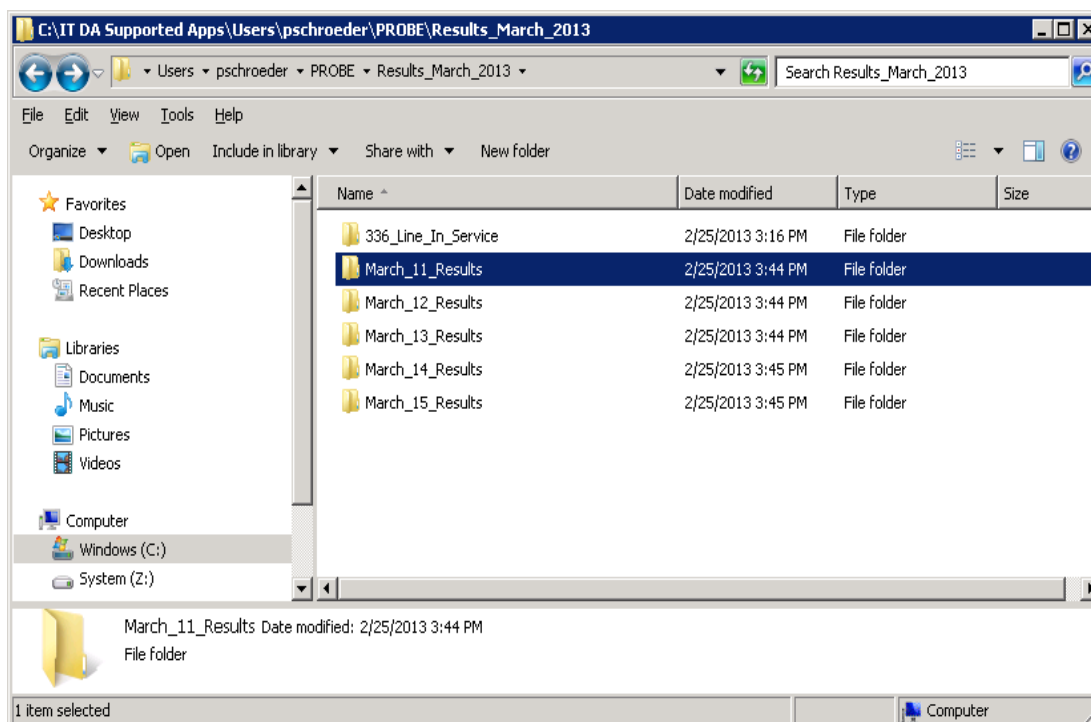
aggregatedpnodeid	aggpnodename	pnodeid	pnodename	factor	localeffectiveday
321	UN.FRNLNSQ11.510CC	4061	UN.FRNLNSQ11.5M10	0.5	1/29/2012
321	UN.FRNLNSQ11.510CC	4060	UN.FRNLNSQ11.5M10A	0.5	1/29/2012
322	UN.FRNLNSQ11.511CC	4063	UN.FRNLNSQ11.5M11	0.5	1/29/2012
322	UN.FRNLNSQ11.511CC	4062	UN.FRNLNSQ11.5M11A	0.5	1/29/2012
323	UN.FRNLNSQ11.59CC	4058	UN.FRNLNSQ11.5M9A	0.5	1/29/2012
323	UN.FRNLNSQ11.59CC	4059	UN.FRNLNSQ11.5M9	0.5	1/29/2012
324	UN.CDEC 13.8AETN	6440	UN.CDEC 13.8AETG	0.5	1/29/2012
324	UN.CDEC 13.8AETN	6439	UN.CDEC 13.8AETS	0.5	1/29/2012
326	UN.ALTRISCO13.8ALTR	6436	UN.ALTRISCO13.8ALT4	0.25	1/29/2012
326	UN.ALTRISCO13.8ALTR	6437	UN.ALTRISCO13.8ALTS	0.25	1/29/2012
326	UN.ALTRISCO13.8ALTR	6434	UN.ALTRISCO13.8ALT1	0.25	1/29/2012
326	UN.ALTRISCO13.8ALTR	6435	UN.ALTRISCO13.8ALT2	0.25	1/29/2012
380	UN.COMERFRD13.8COMF	4045	UN.COMERFRD13.8COM4	0.25	1/29/2012
380	UN.COMERFRD13.8COMF	4044	UN.COMERFRD13.8COM3	0.25	1/29/2012
380	UN.COMERFRD13.8COMF	4042	UN.COMERFRD13.8COM1	0.25	1/29/2012
380	UN.COMERFRD13.8COMF	4043	UN.COMERFRD13.8COM2	0.25	1/29/2012
388	UN.DARTMTH 13.8DART	6441	UN.DARTMTH 13.8DARG	0.5	1/29/2012
388	UN.DARTMTH 13.8DART	6442	UN.DARTMTH 13.8DARS	0.5	1/29/2012
461	UN.LENERGIA13.8LENR	6427	UN.LENERGIA13.8LNST	0.5	1/29/2012
461	UN.LENERGIA13.8LENR	6431	UN.LENERGIA13.8LNST	0.5	1/29/2012


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	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

Attachment D - PROBE Batch Mode Set-up and Operation

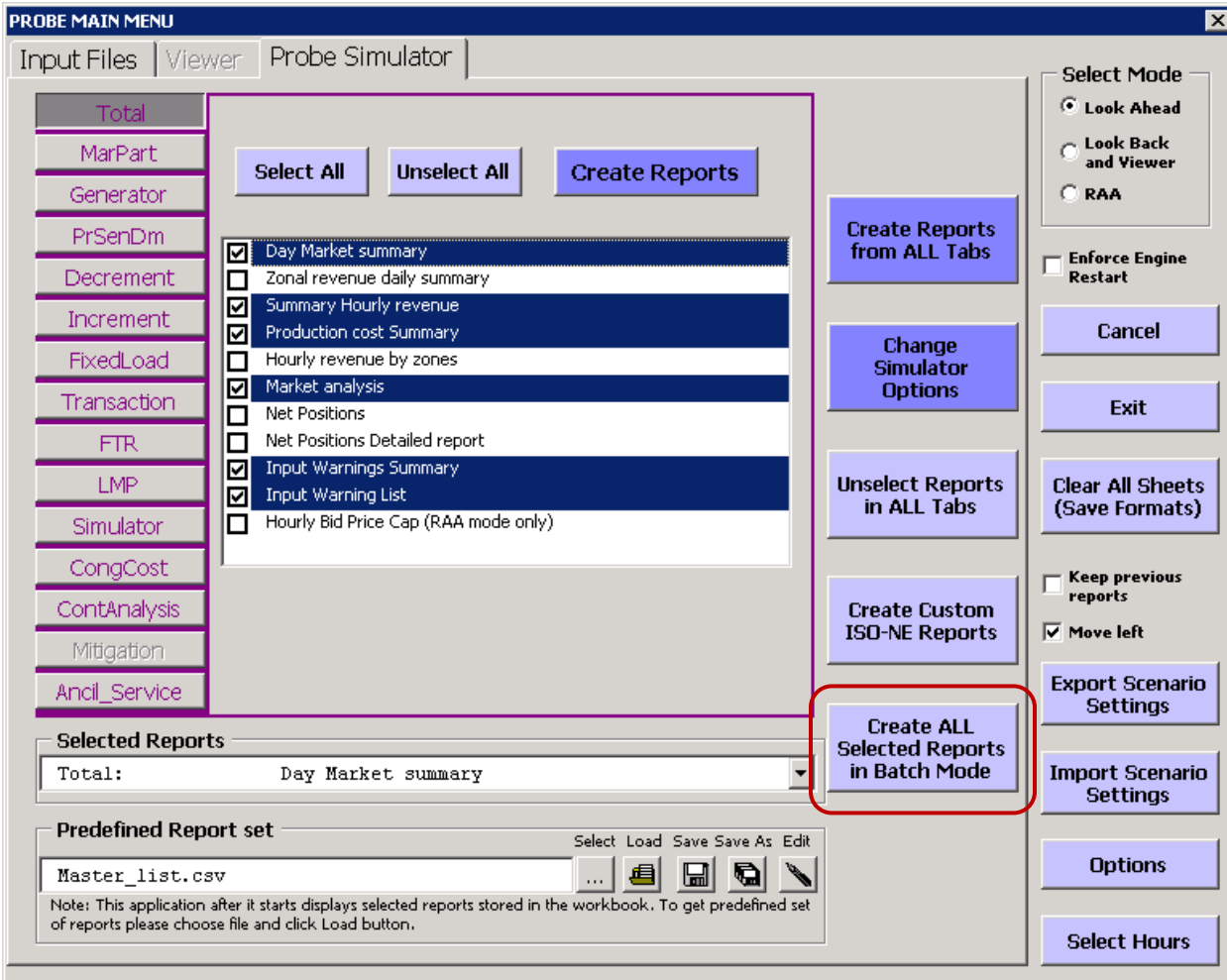
The following screens and steps describe Multi-Day, Batch Mode operation for PROBE Look-Ahead Studies:

1. CREATE separate folders for each day's results as shown below. Results **cannot** be grouped into the same folder, otherwise, PROBE will post the same results for the first day to all folders.



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	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

- NAVIGATE to the “PROBE Simulator” tab in the PROBE Excel spreadsheet and SELECT “Create ALL Selected Reports in Batch Mode”.



PROBE MAIN MENU

Input Files | Viewer | **Probe Simulator**

Select Mode

- ☒ Look Ahead
- ☐ Look Back and Viewer
- ☐ RAA

☐ Enforce Engine Restart

Buttons: Cancel, Exit, Clear All Sheets (Save Formats), Keep previous reports, ☒ Move left, Export Scenario Settings, Import Scenario Settings, Options, Select Hours

Left Sidebar (Reports):

- Total
- MarPart
- Generator
- PrSenDm
- Decrement
- Increment
- FixedLoad
- Transaction
- FTR
- LMP
- Simulator
- CongCost
- ContAnalysis
- Mitigation
- Ancil_Service

Report Selection List:

- ☒ Day Market summary
- ☐ Zonal revenue daily summary
- ☒ Summary Hourly revenue
- ☒ Production cost Summary
- ☐ Hourly revenue by zones
- ☒ Market analysis
- ☐ Net Positions
- ☐ Net Positions Detailed report
- ☒ Input Warnings Summary
- ☒ Input Warning List
- ☐ Hourly Bid Price Cap (RAA mode only)

Buttons: Select All, Unselect All, Create Reports

Buttons (Right): Create Reports from ALL Tabs, Change Simulator Options, Unselect Reports in ALL Tabs, Create Custom ISO-NE Reports, **Create ALL Selected Reports in Batch Mode** (highlighted)

Selected Reports:


Total: Day Market summary

Predefined Report set

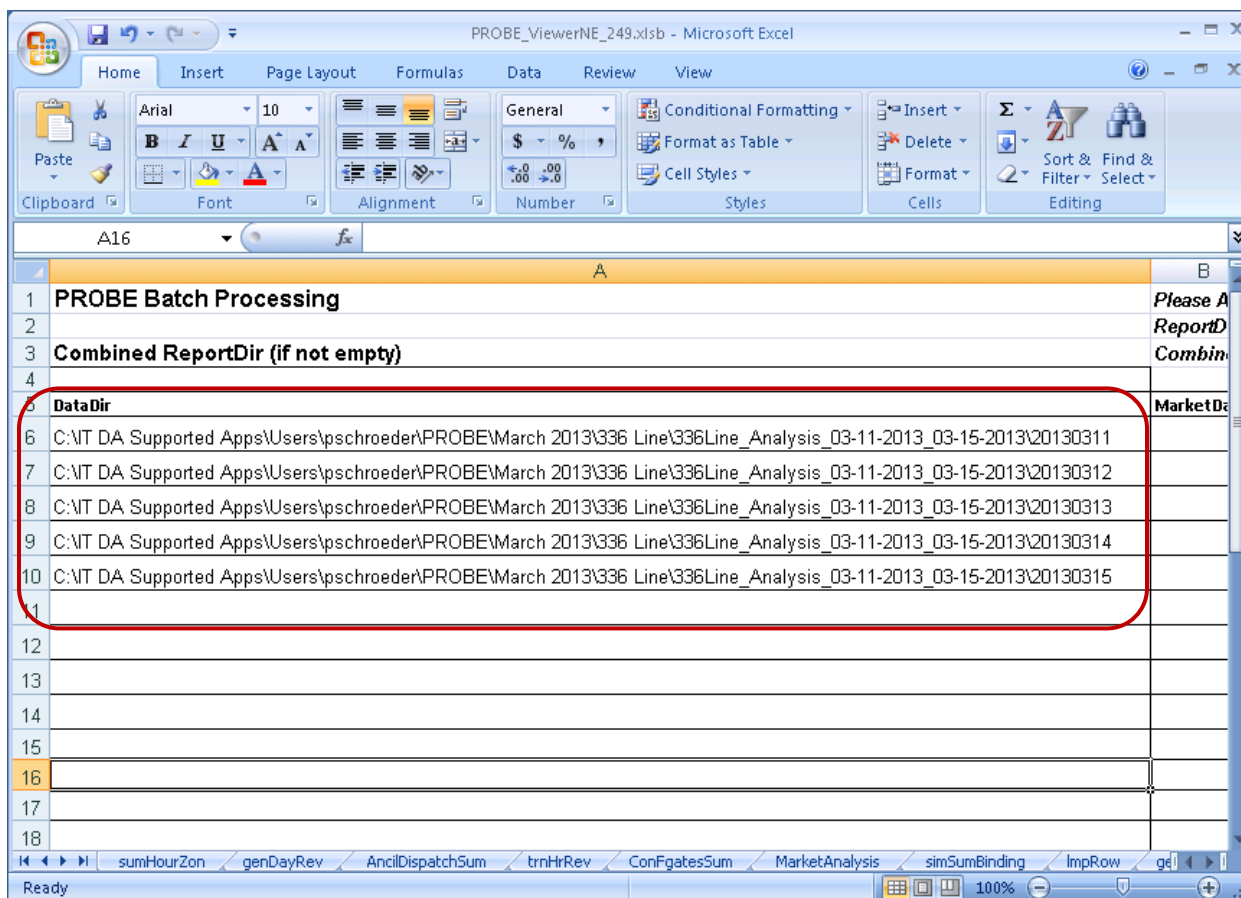
Master_list.csv


Select Load Save Save As Edit

Note: This application after it starts displays selected reports stored in the workbook. To get predefined set of reports please choose file and click Load button.

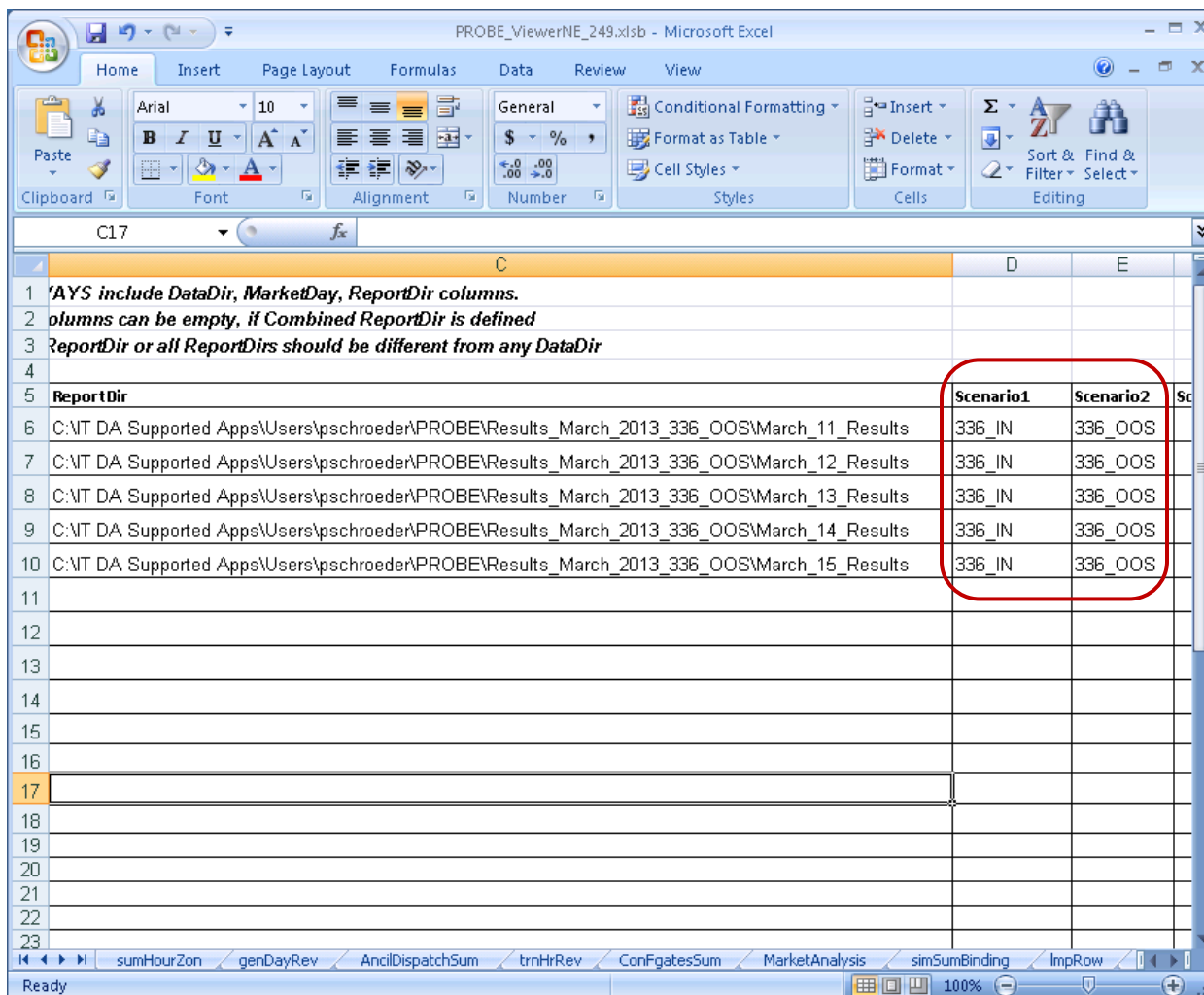
	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

- SET the “DataDir” paths to where the input data resides for each corresponding day.



	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis Revision Number: 9 Effective Date: October 26, 2022 Valid Through: October 26, 2024
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	
	Procedure Owner: Andrew Kopacka	
	Approved By: Director, Operations Support Services	


5. IDENTIFY the Scenario1, Scenario2....Scenario6 names as desired.



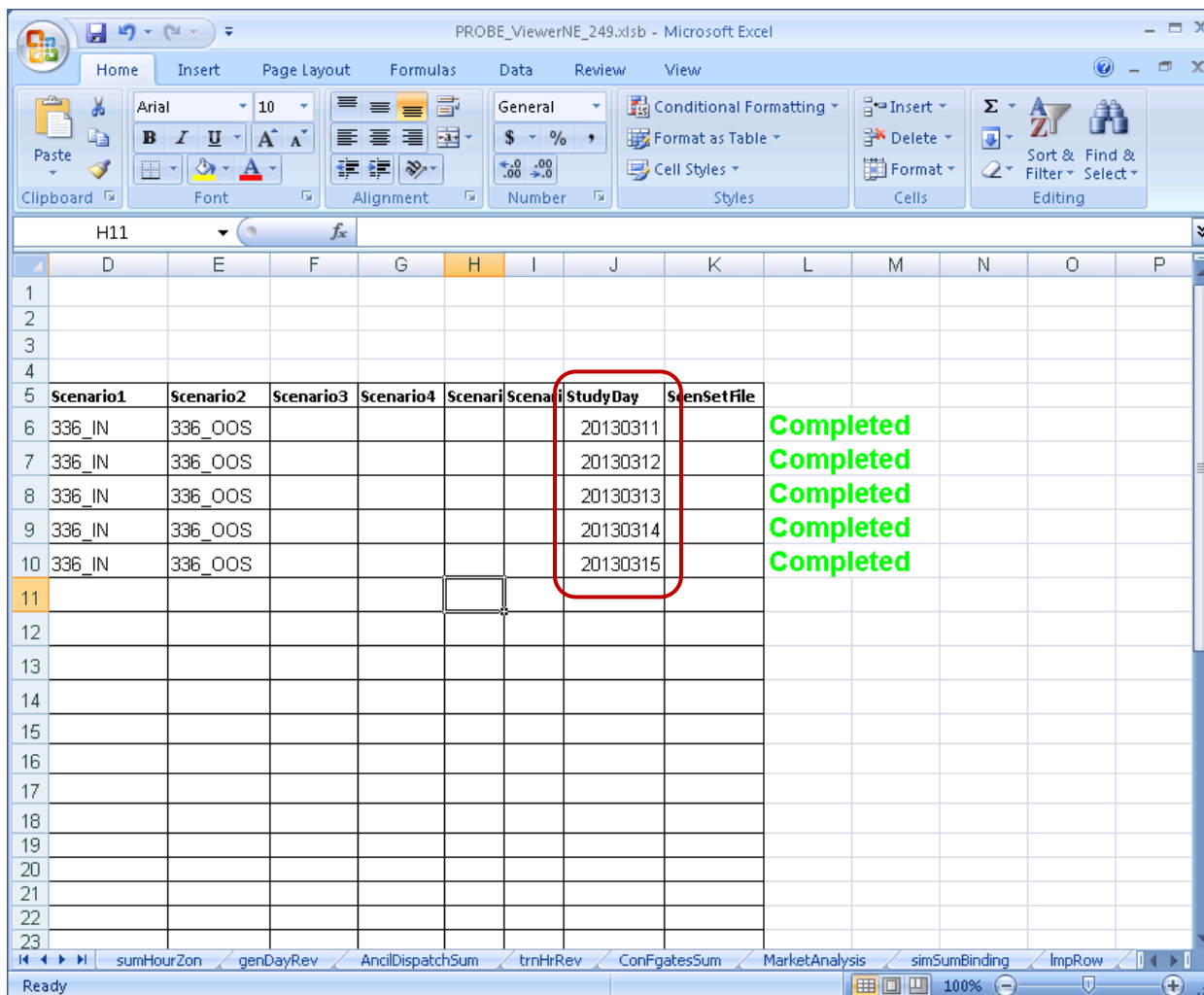
PROBE_ViewerNE_249.xlsx - Microsoft Excel

	ReportDir	Scenario1	Scenario2	Sc
1	AYS include DataDir, MarketDay, ReportDir columns.			
2	columns can be empty, if Combined ReportDir is defined			
3	ReportDir or all ReportDirs should be different from any DataDir			
4				
5	ReportDir	Scenario1	Scenario2	Sc
6	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013_336_OOS\March_11_Results	336_IN	336_OOS	
7	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013_336_OOS\March_12_Results	336_IN	336_OOS	
8	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013_336_OOS\March_13_Results	336_IN	336_OOS	
9	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013_336_OOS\March_14_Results	336_IN	336_OOS	
10	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013_336_OOS\March_15_Results	336_IN	336_OOS	
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				


Ready | 100%

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis Revision Number: 9 Effective Date: October 26, 2022 Valid Through: October 26, 2024
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	
	Procedure Owner: Andrew Kopacka	
	Approved By: Director, Operations Support Services	

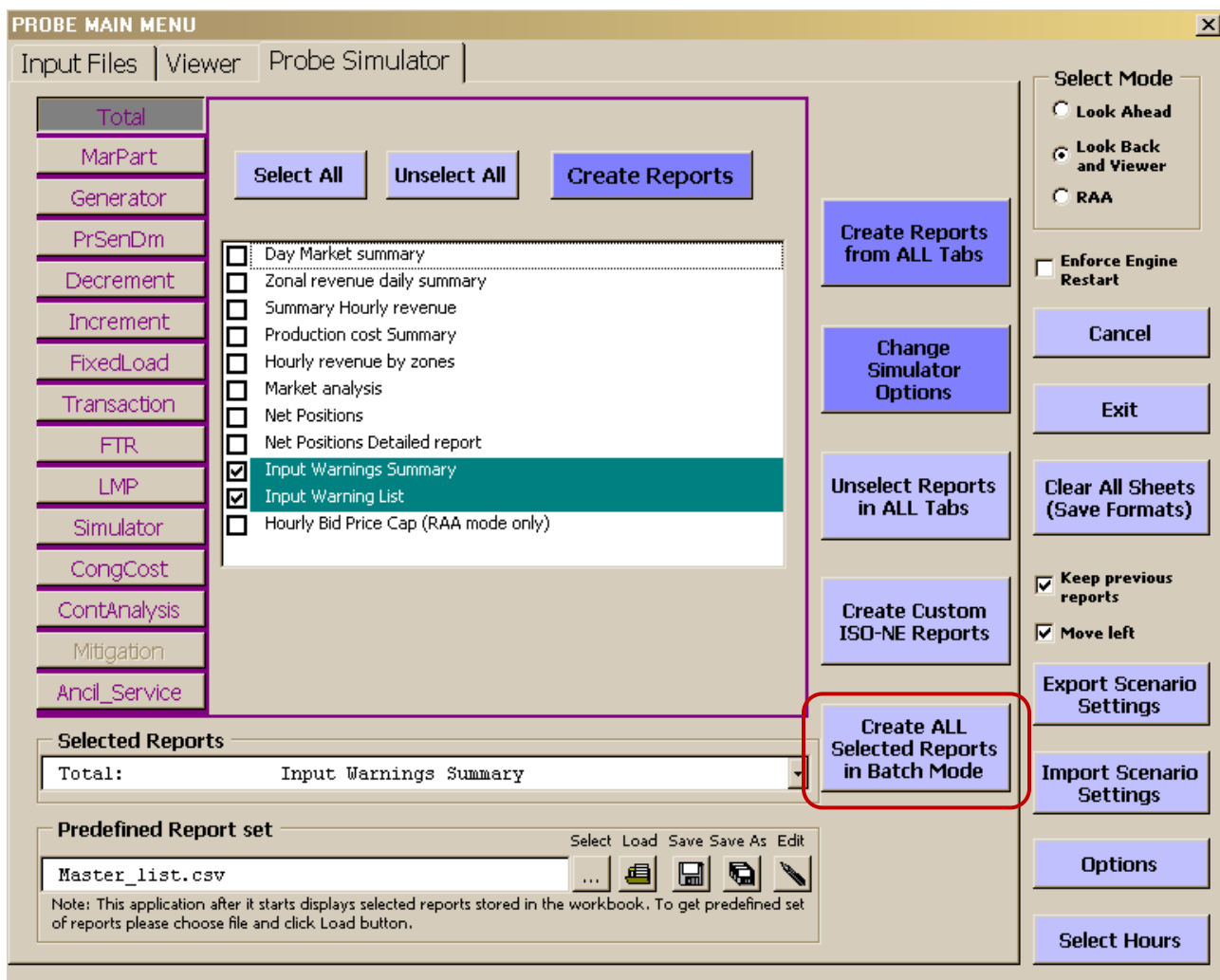
6. ENTER the appropriate study-day dates into the “Study Day” column.




	D	E	F	G	H	I	J	K	L	M	N	O	P
1													
2													
3													
4													
5	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6	StudyDay	ScenSetFile					
6	336_IN	336_OOS					20130311						
7	336_IN	336_OOS					20130312						
8	336_IN	336_OOS					20130313						
9	336_IN	336_OOS					20130314						
10	336_IN	336_OOS					20130315						
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													

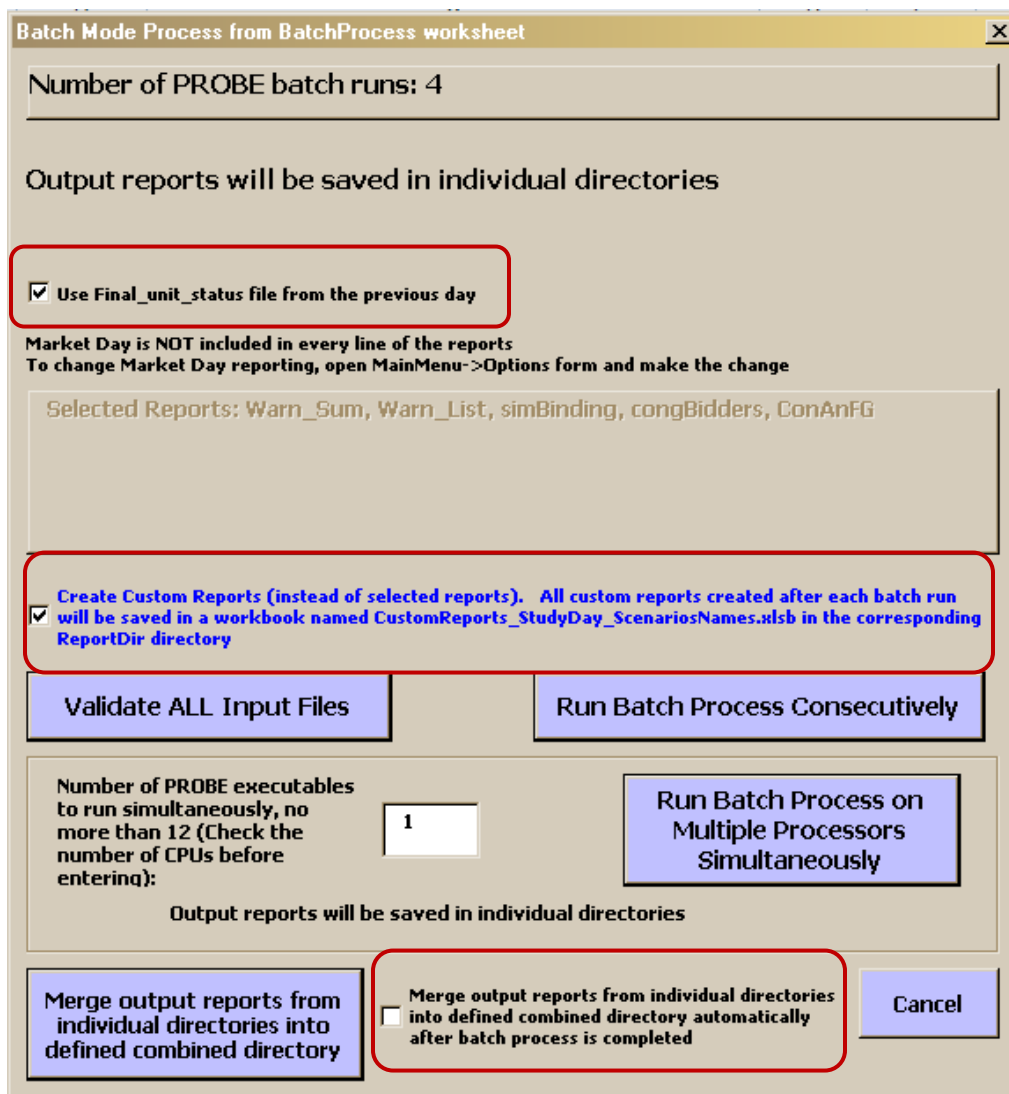
	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

- CLICK “Create All Selected Reports in Batch Mode” to get back into the “Batch Mode Process display



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	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

8. CLICK the “Validate All Input Files” and verify that all the files in the input folders are included and that the filepaths on the BatchProcess spreadsheet are correct.
 - a. CHECK the “Use Final_unit_status...day” box to enable PROBE to pass the unit run histories from one (1) day to the next
 - b. CHECK the “Create Custom Reports...” box to create the ISONE custom reports in the results path. If the box is **not** checked, all the reports selected in the PROBE Simulator tab will be created for each day.
 - c. The “Merge output reports from individual directories...” box is normally unchecked as this does **not** work with the ISONE custom reports.



Batch Mode Process from BatchProcess worksheet

Number of PROBE batch runs: 4

Output reports will be saved in individual directories

☒ Use Final_unit_status file from the previous day

Market Day is NOT included in every line of the reports
To change Market Day reporting, open MainMenu->Options form and make the change

Selected Reports: Warn_Sum, Warn_List, simBinding, congBidders, ConAnFG


☒ Create Custom Reports (instead of selected reports). All custom reports created after each batch run will be saved in a workbook named CustomReports_StudyDay_ScenariosNames.xlsb in the corresponding ReportDir directory

Validate ALL Input Files Run Batch Process Consecutively

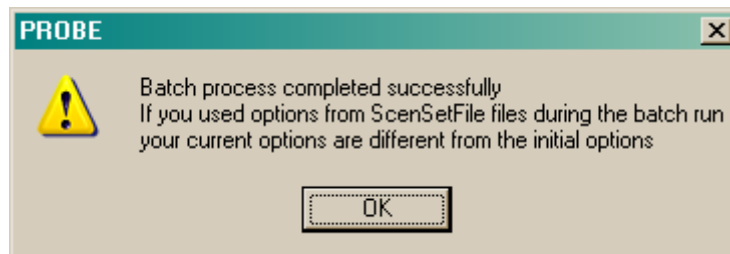
Number of PROBE executables to run simultaneously, no more than 12 (Check the number of CPUs before entering): 1 Run Batch Process on Multiple Processors Simultaneously

Output reports will be saved in individual directories

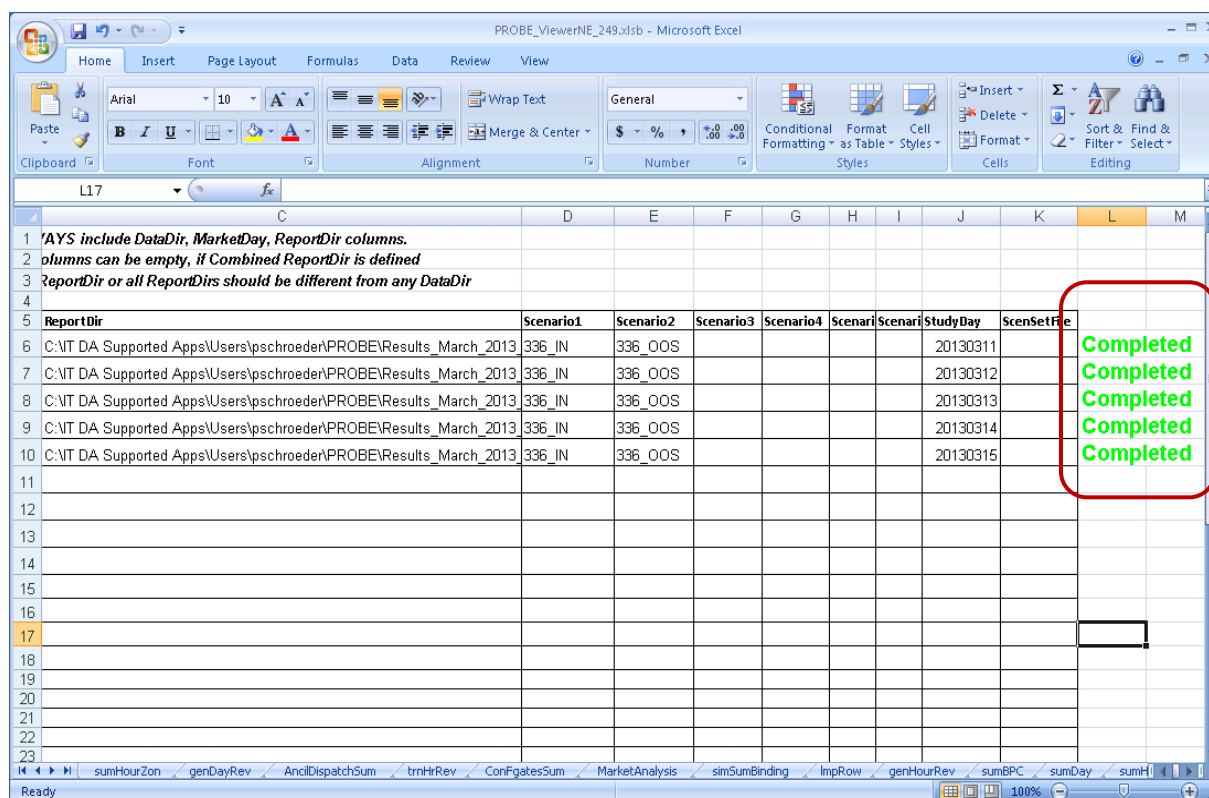
Merge output reports from individual directories into defined combined directory ☐ Merge output reports from individual directories into defined combined directory automatically after batch process is completed Cancel

	© ISO New England Inc. 2022	Procedure: Long-Term Outage Economic Analysis
	Process Name: Capture and Evaluate Outage Requests	
	Procedure Number: OUTSCH.0030.0070	Revision Number: 9
	Procedure Owner: Andrew Kopacka	Effective Date: October 26, 2022
	Approved By: Director, Operations Support Services	Valid Through: October 26, 2024

9. CLICK the “Run Batch Process Consecutively” to run PROBE on one (1) CPU processor core OR SPECIFY the number of CPU processor cores (up to twelve (12)) and CLICK the “Run Batch Process on Multiple Processors Simultaneously.” Selecting multiple processor cores speeds up the PROBE solution process significantly. When PROBE has successfully solved each day, the following success message will be displayed:



Also, “Completed” will appear in Green to the right of the “ScenSetFile” column. The daily reports will be available in each specified results folder.



	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6	Scenario7	StudyDay	ScenSetFile
6	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013	336_IN	336_OOS					20130311	Completed
7	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013	336_IN	336_OOS					20130312	Completed
8	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013	336_IN	336_OOS					20130313	Completed
9	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013	336_IN	336_OOS					20130314	Completed
10	C:\IT DA Supported Apps\Users\pschroeder\PROBE\Results_March_2013	336_IN	336_OOS					20130315	Completed
11									
12									
13									
14									
15									
16									
17									
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19									
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21									
22									
23									