

PEAK Reliability Simulator V20 Applications

PWUWG - 6/7/2017

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PEAKRELIABILITY
assuring the wide area view

PEAK Reliability Practices

1. Outage Coordinating Context
2. Scheduled Actions Process
3. PEAK AUX Applications
4. CA Historical Notes Processing
5. Other PEAK V20 Updates



Outage Coordinating (OC) Context

Each RC shall develop, implement, and maintain an OC process for generation and transmission outages within its RC Area. The OC process shall:

- 1.1. Identify applicable roles and reporting responsibilities including:
 - 1.1.1. Development and communication of outage schedules.
 - 1.1.2. Assignment of coordination responsibilities for outage schedules between TOP(s) and BA(s).
- 1.2. Specify outage submission timing requirements.
- 1.3. Define the process to evaluate the impact of Transmission and generation outages within its Wide Area.
- 1.4. Define the process to coordinate the resolution of identified outage conflicts with its TOP(s) and BA(s), and other RC(s).



Outage Coordinating (OC) Context

- Alstom STNET Convention
 - Limited brut force in/out-service method
 - No basecase vs. schedule data discrepancy problems
 - Overly dependent on schedule/WSM mapping



Outage Coordinating (OC) Context

- PowerWorld Simulator Convention
 - Schedule application based on Start/End times
 - Basecase vs. schedule data discrepancies problems
 - Robust topology change applications



Scheduled Actions Process: Retrieving Schedule Data



Operation Planning Analysis

Studies

+ Create Study + Create Short Range Study

Study Type	Snapshot Date (MST)	Study Date (MST)	Study Status	Engineer Performing Study	Created
Report Date: 06/10/2017					
Short Range (SR) Study	06/09/2017 00:00	06/10/2017 23:59	Outages Retrieved	Gene Duran	06/01/2
Report Date: 06/09/2017					
Short Range (SR) Study	06/08/2017 00:00	06/09/2017 23:59	Outages Retrieved	Gene Duran	05/31/2
Report Date: 06/08/2017					
Short Range (SR) Study	06/07/2017 00:00	06/08/2017 23:59	Crow Update Finished	Joe Mercer	05/31/2
Report Date: 06/07/2017					
Short Range (SR) Study	06/06/2017 00:00	06/07/2017 23:59	Crow Update Finished	Joe Mercer	05/30/2

OPA_06082017_SR_JM_CosOutagesUpdateErrors.csv

OPA_06082017_SR_JM_cos_outages.csv



Scheduled Actions Process: Retrieving Schedule Data

	Name	Active
1	Submitted	NO
2	Cancelled	NO
3	Implemented Verified	YES
4	Completed Verified	YES
5	Invalid	NO
6	BA Preliminary	NO
7	BA Proposed	NO
8	BA Confirmed	YES
9	BA & TOP Confirmed	YES
10	TOP Preliminary	NO
11	TOP Proposed	NO
12	TOP Confirmed	YES
13	RC Long-Range Confirmed	YES
14	RC Long-Range Conflicts Identified	NO
15	RC Long-Range Denied	NO
16	RC Short-Range Confirmed	YES
17	RC Short-Range Conflicts Identified	NO
18	RC Short-Range Denied	NO
19	RC OPA D+2 Confirmed	YES
20	RC OPA D+2 Conflicts Identified	NO
21	RC OPA D+1 Confirmed	YES
22	RC OPA D+1 Conflicts Identified	NO
23	RC OPA Denied	NO
24	RCSO Confirmed	YES
25	RCSO Conflicts Identified	NO
26	RCSO Denied	NO
27	Implemented Unverified	YES
28	Completed Unverified	YES
29	Expired	NO

OPA_06082017_SR_JM_cos_outages.csv



Scheduled Actions Process: Loading Forecast Data

The screenshot displays the 'Scheduled Actions' application window. At the top, there are controls for Start Time (3/23/2017), View Time (3/31/2017), End Time (5/31/2017), Resolution (1 Days), and Animation (1 Seconds). Below these are 'Play' and 'Stop' buttons. A 'Save Snapshot' and 'Set Reference' button are also present. The main area features a table with columns: Override Active, Memo, Ticket Number, Start Time, and Status. A context menu is open over the table, showing options: 'Load Auxiliary File', 'Other', 'CSV File (only ScheduledActionGroup data)...', 'CROW CSV File...', and 'CROW CSV File with settings...'. The bottom of the window has buttons for 'Import Settings', 'Identify Breakers', 'Delete All', 'OK', 'Help', and 'Cancel'.

Override Active	Memo	Ticket Number	Start Time	Status
1 Inherit		1-00031703	07/24/2009 11:5	
2 Inherit		1-00033651	08/07/2009 11:59	08/14/2020 00:00 Canc
3 Inherit		1-00065378	06/05/2002 17:44	03/31/2017 18:00 Subm

Scheduled Actions Process: Loading Forecast Data

Header line: First File: S:\engineering\public\PowerWorld\Scheduled Acti Browse

Device Mapping Action Definition Outage Definition

Type Header Label Formats

Equip Type Unit Edit New

Device Types	Device Code(s)	Preferred Label Format
Generators	UN	Unit
Branches	LN,ZBR,CB,XF	Circuit Breaker
Switched Shunts	CP	Unit
Loads	LD	Load
Interfaces	INTRFC	Interface
Injection Groups		

Save to AUX Load from AUX OK Help Cancel



Scheduled Actions Process: Loading Forecast Data

Device Mapping | Action Definition | **Outage Definition**

Action Header **Default Action** **Value Header**

Eq Outage Status None Deration

Action Mapping Values

Open
Open

Close
Closed

Open Breakers
OpenCB

Close Breakers
ClosedCB

Custom Actions

Custom Action Code	Action Type	Device Type	Target Field	
Unit derate	Set To	Gen	MW Output ¹	Find
Positive Interface derat	Set To	Interface	Limit Monitor	Find
Negative Interface dera	Set To	Interface	Limit Monitor	Find
Unit Commitment	Set To	Gen	MW Output ¹	Find

Device Mapping | Action Definition | **Outage Definition**

Outage ID CROW ID

Description Description

Start Time Start Date & Time

End Time End Date & Time

Outage Status Outage Status

Default Status Preliminary



Scheduled Actions Process: Loading Forecast Data

WSM basecase and CROW data discrepancy reports the following inconsistencies:

- Device Normal Status Parameter
- Line/Transformer To/From Station, Owner, or BA...
- Device Validation
 - Mapping
 - Schedule Action Type



Scheduled Actions Process: Loading Forecast Data

Data Sets Used (Source)

- Schedule Data (CROW)
- Path/TTC Limits (CROW)
- Unit Commitment (EIDE)
- *Load Forecast (EIDE)



Scheduled Actions Process

- Check Conflict
- Apply All Within Resolution
- Switching Device Options
- Update/Append Schedule Data Convention



PEAK AUX File Applications

1) Basecase Check

- Compares WSM case vs. COS Schedules
- Reports discrepancies

2) Schedule Group Screen

- Inhibits some basecase discrepancies
- Allows only active schedules between Start Time and End Time



PEAK AUX File Applications

3) Schedule Verification

- Custom field identifying failed Applied/Restored schedules
- Restored device actions limited by conflicting schedules

4) Restored Generation Loading

- Assumption for lack of unit commitment forecast
- Empirical loading based on unit/fuel type



PEAK AUX File Applications

- ## 4) Long Range Outage Coordination Screen
- Inhibits schedules that do not meet LR criteria
 - 5 or more day outage duration
 - BA & TOP or BA confirmed
 - Planned generation or transmission type



PEAK AUX File Applications

5) Other AUX Applications

- Model Feedback Report
- Model Compare Report
- Basecase Switch Shunt AVR Parameter Updates
- Scheduled Action Generator/SS Parameter



CA Historical Notes Processing

Contingency Analysis

Contingencies Options Results

View Results By Element

- Lines/Transformers
- Buses
- Interfaces
- Bus Pairs
- Nomogram Interfaces
- Custom Monitors
- View Results by Contingency
- Contingency Violation List
- Violation CTG Notes

Contingency Violation List

	Category	Percent	Label	Memo	Viol CTG Note	Include Remedial Actions	Rem Acti
1	Branch	106.66	MUC3L005	*FLAGSTAFF - PINNACLE PK 1	Offline RAS ar	YES	
2	Branch	101.32	SMD2L024	*CORDOVA - WHITEROCK 23	Dynamic rating	YES	
3	Branch	105.78	WSN2L035	*CTNWDW - SHASTA #2	230 k	YES	
4	Branch	105.82	WSN2L017	*SHASTA - CTNWDW #1	230 k	YES	
5	Branch	109.36	BCT1L039	MALASPINA-PENDERHB-SECH		NO	

View/Modify Existing Violation CTG Note

Show Dialog...

Display/Column Options...

Find... Ctrl+F

Search for Text...

Contingency Violation Note Dialog

Contingency Find Filter Substation Find

ObjectType Filter Min kV

Object Find Filter Max kV

Category Find Filter Find

Note

Offline RAS arming needs reviewed.



Other PEAK V20 Updates

In addition to Scheduled Action enhancements:

- 1) WSM, RASMOM, and CTG Translation
- 2) Parallel Network Processing
- 3) Contingency Analysis (CA) Screening
- 5) Oneline Viewer
- 6) Alstom Case State Import



Any Questions?

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