

Outage Management Redesign Consultation Process (SE-109)

August 7, 2013



- Stakeholder Feedback & IESO Response
 - Implementation Plan for Interim & Final Redesigns
 - Changes to Final Process Redesign
- Proposal for Interim Process
- Draft Market Rule Changes (Intro, Strategy & Schedule)
- Table-Top Session on Final Redesign
- Next Steps

Feedback & Response: Implementation Plan for Redesign

- Ready for interim process in Q1 2014
 - Assumptions: similar to near-term process using existing software solutions
- One-time implementation from interim to final processes
 - Easier to manage from business planning perspective
- Final transition range between 3 months to 2 years
 - Better understanding once software changes understood
- Minimal training for interim, extensive for final
 - Examples: offline simulations, user guides, site demos etc.
- IESO will consider feedback in upcoming project activities (solution design, business case etc.)

- Advance submission of cancellation costs removed
- Compensation eligibility expanded to include revocation of mid-term approvals
 - Only eligible for outages starting in the first 3 months of the coverage period
 - Outages starting in the last 3 months of the coverage period are subject to rescheduling and at-risk declaration and therefore ineligible (in line with coordination objectives)

- Combination of near-term daily & existing processes:
 - 2-day advance approval becomes a 3-day advance approval with a submission deadline of 5 business days
 - 14 day advance approval process retained
 - Introduction of pre-approval requests for outages with low system impact and a submission deadline of 2 business days
 - Late submissions (formerly Short Notice) are no longer accepted
 - ~~– Introduction of an urgent outage (subset of a forced outage)~~
 - Confirmation of outages no longer applies
 - Advance submission of cancellation costs removed
 - Simplified timestamp retention rules when rescheduling an outage after rejection, revocation or recall (as per the final redesign proposal)

Interim Process Proposal (con't)



- Process is mandatory for all planned outages
 - Submissions due at 23:59 EST, T-5 Business Days, Approvals due at 23:59 EST, T-3 Business Days
- 14 Day Advance Approval process remains unchanged from today
 - Submissions due at 23:59 EST, T-21 Calendar Days, Approvals due on the last business day at 23:59 EST, that is at least T-14 Calendar Days in advance
- Pre-approved outages can be requested up to 23:59 EST, T-2 business days
 - Manual confirmation (like 14 day process) required (auto-processing unavailable)
 - Must meet pre-approved criteria (to be developed within SE-109)
 - Still subject to IESO advance approval / rejection (auto-validation unavailable)
 - Advance approval implies final approval and no need to report actual start or end times (as long as scope remains unchanged)
- Forced outages are incorporated up to real-time (T=0)
- Timestamp retention rules for rejection/revocation/recall
 - Must be rescheduled within 5 business days
 - Retention available only once for rejections

- Confirmation timestamp will be ignored
- Short Notice flag will remain (used to track late submissions)
 - Invoked for submissions beyond T-5 business days
- Manual confirmation required to differentiate between late submissions and requests for pre-approval
 - Tracked at the end of T-2 business days
- ~~'Forced' flag will be used to identify Urgent outages~~
 - ~~— Software changes to extensive, introduced for familiarity purposes~~

- Initial proposal was to introduce draft interim and final process rules
- Several observations made:
 - Complex Rule Structure (3 stage process introduced under a single process framework).
 - Table-top scenarios introduced potential process gaps (i.e.: pre-approved outage conflicts & compensation claims)
 - Future activities could identify potential process changes:
 - Table-top scenarios
 - Software design & vendor selection
 - Operation under an interim process
- Alternate Approach
 - Introduce interim process rules, revisit final rule set prior to implementation of the final process

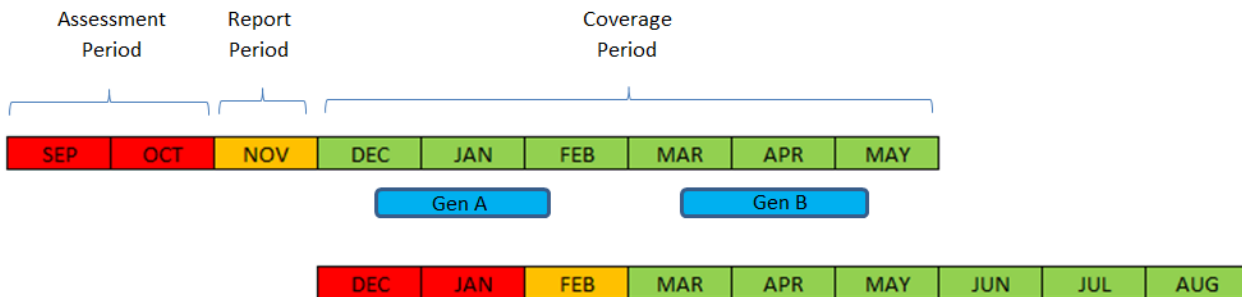
- July 23 – Technical Panel unanimously voted that rule changes warrant consideration
- Aug 7 – Present draft rules to SE-109 and post rule for Technical Panel Review
- Aug 13 – Technical Panel vote to post rules for comment period (3 weeks)
- Sept 17 – Pending no significant changes, Technical Panel vote for IESO Board Approval

- Scenarios Demonstrating:
 - Submission Criteria (inclusions and exclusions)
 - Conflict identification and resolution
 - Communications
 - Implications of at risk declarations, revocations, and rejections

- Higher Level Assessments
 - Adequacy margins and forced outages will be considered when planning and approving outages further out
- Outage Matrix
 - Outage planning guidelines (allow or prevent certain outage combinations)
- Communications
 - Make participants aware of impactful outages
 - Provide alternate recommendations

- No more than 1 500 kV & 3 230 kV transmission elements out-of-service (O/S) at one time in South-West or South-Central Ontario
- No more than 1 generator O/S in certain Northwest & Northeast corridors for:
 - Gen Owner A
 - Gen Owner B
- No more than 2, 500/230 GTA auto-transformers O/S at one time
- Gen Owner C outage limitations for the following transmission outages conditions:
 - 3 units for Transmission element X
 - 2 units for Transmission element Y
 - 1 unit for Transmission element Z
 - 0 units for any combination of Transmission elements X, Y or Z
- No more than 1 Michigan/New York tie-line O/S at one time

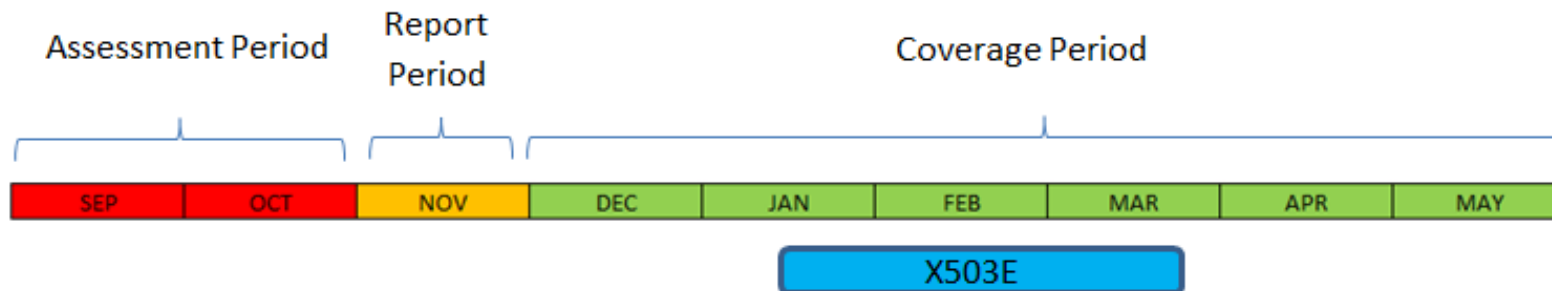
Mid-Term Process Examples: Compensation vs. No Compensation



DECEMBER						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
Gen A (Dec 22-24)						

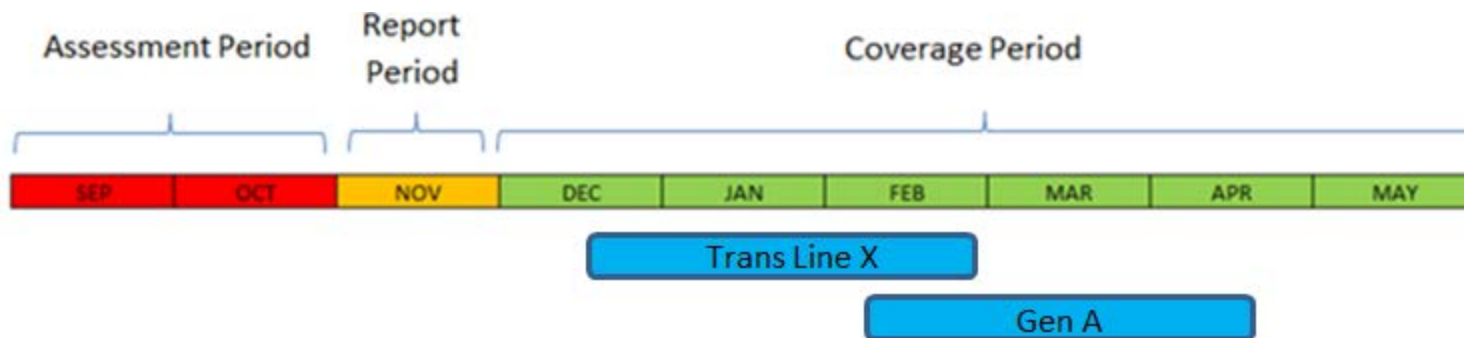
- At the end of the assessment period:
 - Gen A receives advance approval to start on Dec 22 (now 1 ½ months away)
 - Gen B receives advance approval to start on Mar 15 (now 4 ½ months away)
- Gen A gets re-evaluated in the near-term weekly process (week of Dec 5th)
 - Gen A gets revoked due to a forced outage conflict
 - Gen A is eligible for compensation
- Gen B get re-evaluated in the next mid-term process (now 3 ½ months away) with 3 potential outcomes:
 - No Conflict: IESO maintains approval (compensation eligible).
 - Conflict Found: Outage is IESO-repositioned within the coverage period (maintains approval and compensation eligible).
 - Conflict Found: MP leaves the outage as is and IESO issues an At Risk (approval removed, compensation ineligible).

Mid-Term Process Examples: At Risk (Lack of Information)



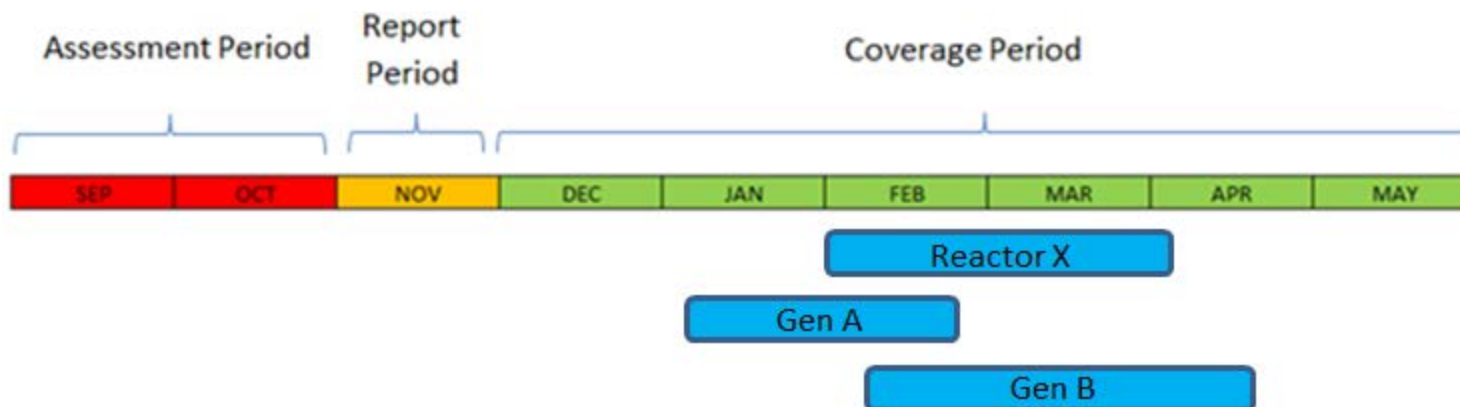
- Timestamp = Aug 5, 2013
- Sept 1, mid-term submission window closes & impacted generators are notified of the planned outage
- X503E outage imposes at Flow North (FN) limit of 600 MW
- IESO sees no other conflicting transmission or generation outages, however several North-East generators report they cannot commit to the minimum generation requirements for the FN limit at this time
- Rescheduling the outage within the coverage period does not improve generator outlook.
- By the end of the Assessment Period, outage flagged as 'At Risk'.
- Transmitter has 2 options:
 - Reschedule the outage to start beyond the first 3 months of the coverage period prior to the end of the report period (retain original timestamp and re-evaluated in the next mid-term cycle)
 - Leave the outage as is and wait for near-term assessment (likely the better option considering only barrier is water outlook)

Mid-Term Process Examples: At Risk (Scheduling Conflict)



- Trans Line X timestamp = Aug 25/13
- Gen A timestamp = Mar 30/13
- Sept 1, Mid-term submission window closes & participants are notified of impactful outages
- IESO determines that an outage to Trans Line X would create thermal concerns on companion lines without the support of Gen A
- Since Gen A has a better timestamp, it gets an advance approval
- Assuming no rescheduling opportunity, Trans Line X receives an 'At Risk'
- Transmitter has 2 options:
 - Reschedule Trans Line X to start beyond the first 3 months of the coverage period prior to the end of the report period (retain original timestamp and re-evaluated in the next mid-term cycle)
 - Leave the outage as is and wait for near-term assessment

Mid-Term Process Examples: Rescheduling & Advance Approval



- Timestamp Order: Reactor X → Gen A → Gen B
- According to the outage matrix, only 1 generator can overlap with Reactor X (voltage control concerns)
- IESO determines that moving Gen B to start after the Gen A outage is acceptable (no other conflicts found)
- If Gen B moves the outage based on IESO recommendation, they will retain their original timestamp
- All three outages will receive advance approval at the end of the assessment period and higher priority in the near-term assessment process (for example, over any other generator or transmitter outages that would be critical for voltage control)

- Critical = any element that impacts a security limit
- Defined in IESO operating instructions (System Control Orders – SCOs)
 - Flow Into Ottawa (X523A, Hawthorne T2 etc.)
 - Wawa-Mackay-Flow-East (W23K, P25W etc.)
 - Ontario-New York (PA301, L33P etc.)
- The only generator equipment currently critical to limits are automatic voltage regulators (AVRs)
- Participants will know which of their outages (and others) qualify as critical within boundaries of confidentiality

Near-Term Weekly Examples: Mid-term & Near-Term Conflicts

MAY 2014						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

- Gen A (blue) has a Mid-Term Approval
- Gen B submits a new outage (yellow) by EOB May 2 and confirm inclusion into the near-term weekly process (Gen B isn't critical, but wants to take advantage of the near-term weekly features)
- Gen B is now subject to the near-term weekly restrictions (treated like a critical outage)
- IESO determines that the Gen A & B outages cannot overlap (Gen A has priority)
- IESO can recommend Gen B start on Sunday or reject the outage. If Gen B agrees to reschedule to start on Sunday, they will retain timestamp and get an outage approval.
- If Gen B elects not to reschedule to Sunday, IESO rejects the outage and Gen B has 5 business days to resubmit on their own terms and still retain timestamp but must adhere to the submission requirements for a critical outage (because they elected to take part in the weekly process)
- Timestamp retention can only occur once after an outage rejection

Near-Term Weekly Examples Mid-Term Revocation

MAY 2014							JUNE 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	4	5	6	7	8
4	5	6	7	8	9	10	9	10	11	12	13	14	15
11	12	13	14	15	16	17	16	17	18	19	20	21	22
18	19	20	21	22	23	24	23	24	25	26	27	28	29
25	26	27	28	29	30	31	30						

- It is May 4 and Transformer X (red) gets forced from service and not expected to return for a couple of weeks
- IESO begins assessment of the coverage week on May 5 and identifies that that mid-term approved outage to Transformer Y (blue) can no longer proceed. Transformer Y must have its approval revoked.
- The MP can retain the Transformer Y timestamp if the outage is rescheduled within 5 business days (IESO will work with the MP to reschedule)
- If the Transformer Y outage cannot be scheduled to proceed on May 24 (after the forced outages end), the earliest Transformer Y could be scheduled is the week of May 26 (May 9th is the critical submission deadline for that week)

Near-Term Weekly Examples: Near-Term Daily Revocation

MAY 2014							JUNE 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	4	5	6	7	8
4	5	6	7	8	9	10	9	10	11	12	13	14	15
11	12	13	14	15	16	17	16	17	18	19	20	21	22
18	19	20	21	22	23	24	23	24	25	26	27	28	29
25	26	27	28	29	30	31	30						

- It is May 19 and Line X (red) gets forced from service
- Line Y (blue) has a near-term weekly approval and is scheduled to start the next day
- IESO determines that the overlap cannot take place due to thermal concerns.
- IESO revokes the advance approval on Line Y. The MP can retain timestamp by rescheduling the outage within 5 business days, however because Line Y is a critical element, the earliest it can be submitted to start is the week of June 10 (submission deadline is May 23rd)

Opportunity Outages (Following Near-Term Rejection)

MAY 2014						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31




- Gen A (blue) has a mid-term approval & Gen B (yellow) submits a new outage (yellow) by EOB May 2
- On May 5, the IESO notifies Gen B that their outage is rejected due to adequacy concerns. Gen B resubmits the outage into the following week (time-stamp retained)
- On May 6, Gen A withdraws their outage request (timestamp is reset and mid-term approval removed)
- This presents an opportunity for Gen B to take their outage as originally planned. Gen B resubmits their outage as an opportunity outage within the week of May 19th
- This particular opportunity gets identified one of two ways: The IESO notified Gen B (best-effort courtesy) or Gen B saw the opportunity through IESO reports showing an adequacy margin improvement

- Very similar to today's process, except:
 - Submission deadline for all other (non-critical) outages changes from 3 to 5 business days
 - New pre-approved outage class
 - New opportunity outage class (relaxes critical outage submission requirements within the weekly process)
- Non-Critical Outage Examples:
 - All generator outages (with exception of a few AVRs)
 - Most 115 kV transmission elements
- Pre-Approved Outages:
 - Work in progress (to be finalized through SE-109)
 - Low Impact Outages (minimal IESO assessment)
 - Potential Examples: load transformers, protection LOR, station service LOR, generator de-rates & tests

Near Term Daily Process Overlaps

MAY 2014						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

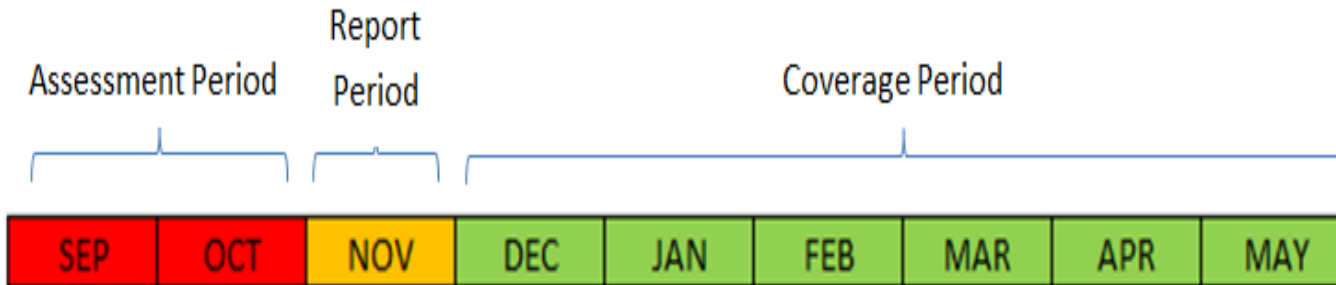
Submission Deadline
Assessment Period
Coverage (Outage) Period

-  Near-Term Weekly (Critical) Timeframes
-  Near-Term Daily (Non-Critical & Opportunity) Timeframes
-  Near-Term Daily (Pre-Approval) Timeframes

Near Term Daily Process: Pre-Approvals Revocation Example

JUNE 2014						
S	M	T	W	T	F	S
1	2	4	5	6	7	8
9	10	11	12	13	14	15

- Pre-approved outages are implied to have advance approval as soon as they are submitted to IESO (as long as they meet the submission requirements)
- Pre-approved outages can only be revoked or recalled.
- IESO takes 1 day to perform sanity check that pre-approvals are still OK to proceed
- MP submits conflicting loss of redundancy protection outages for the same day (Generator A Protection, Generator B Protection)
 - Would result in loss of instantaneous protection
 - IESO identifies the conflict and MP removes one of the two



MAY 2014							JUNE 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	4	5	6	7	8
4	5	6	7	8	9	10	9	10	11	12	13	14	15
11	12	13	14	15	16	17	16	17	18	19	20	21	22
18	19	20	21	22	23	24	23	24	25	26	27	28	29
25	26	27	28	29	30	31	30						

- **Aug 13** – 3 week comment period for interim rules begin
- **Aug 23** – Stakeholder feedback due
 - Final and Interim Design Proposals
 - Suggestions for pre-approvals
 - Suggestions for software solution capabilities
- **Sept 6** – IESO response due
- **Mid Sept** – Next SE-109 Meeting
 - Discuss comments on interim process rules
 - Present Final & Interim process updates (if required)
 - Present pre-approval criteria proposal
 - Table-top session for Interim process (as required)

Questions/Comments?