

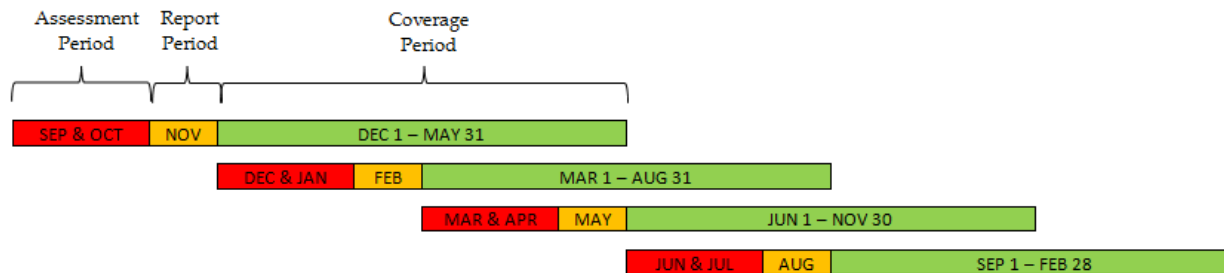
Outage Management Redesign Consultation Process (SE-109)

April 23, 2014



- Review of Final Process Redesign
- Request for Proposal (RFP) Outcomes
 - Successful Respondent (Vendor)
 - Roadmap for Final Process Implementation
 - Vendor Software Capabilities
 - Proposed Software Design (To Date)
- Proposed Assessment Methodologies
- Next Steps

Review of Final Process Redesign: Quarterly Adv. Approval (AA) Process



- Voluntary process, inclusion criteria not applicable (any outages accepted).
- Outages submitted prior to the start of the assessment period will be assessed by the IESO.
- Market Participants (MP) cannot make changes to the outage request without IESO consent (other than cancelling their outage).
- IESO reviews outages, gathers MP feedback and makes rescheduling recommendations as required (timestamp retained if rescheduling approved by IESO).
- By the end of the Assessment Period, IESO issues:
 - Quarterly AA (higher priority timestamp)
 - At Risk (lower priority timestamp). Timestamp will be retained if At Risks are rescheduled to start beyond the first 3 months of the coverage period and done so prior to the next mid-term cycle.
- Security & Adequacy Report issued at the start of the report period – use to make scheduling decisions for the upcoming Weekly AA Process or the next Quarterly AA Process

Review of Final Process Redesign: Weekly Adv. Approval (AA) Process

SEPTEMBER 2013						
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					

	Assessment Period
	Coverage Period (Outage Start Dates)

- Mandatory process for “critical” outages, voluntary for “non-critical”.
- Outages starting in the coverage period and submitted prior to the start of the assessment period will be assessed. New submissions and At Risks will be assessed against Quarterly AAs from the previous quarterly process (Quarterly AAs have priority)
- Market Participants (MP) cannot make changes to the outage request without IESO consent (other than cancelling their outage).
- IESO reviews outages, gathers MP feedback and makes rescheduling recommendations as required (timestamp retained if rescheduling approved by IESO).
- By the end of the Assessment Period, IESO issues:
 - Weekly AA for At Risks and new submissions (Quarterly AAs retained)
 - Rejection of At Risks and new submissions
 - Revocation of Quarterly AAs

Review of Final Process Redesign: 1 & 3 Day Adv. Approval (AA) Process

SEPTEMBER 2013						
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					

	First Assessment Period
	Second Assessment Period
	Coverage Period (Outage Start Dates)

- 2 processes, mandatory for Planned 'non-critical' and Opportunity outages
- Most Planned 'non-critical' but all Opportunity outages are due before the start of the assessment period of the 3 Day AA process (i.e. 5 business days in advance)
- A subset of Planned 'non-critical' outages considered 'low-impact' are due before the start of the assessment period of the 1 Day AA process (i.e. 2 business days in advance)
 - Some 'low-impact' outages receive automatic advance approval (pending software capabilities)
 - Some 'low-impact' outages also receive final approval in advance (pending software capabilities)
- Urgent outages are incorporated into the operating plan up to T-1 calendar days
- Final Approvals and Forced outages are handled in real-time (during T=0)

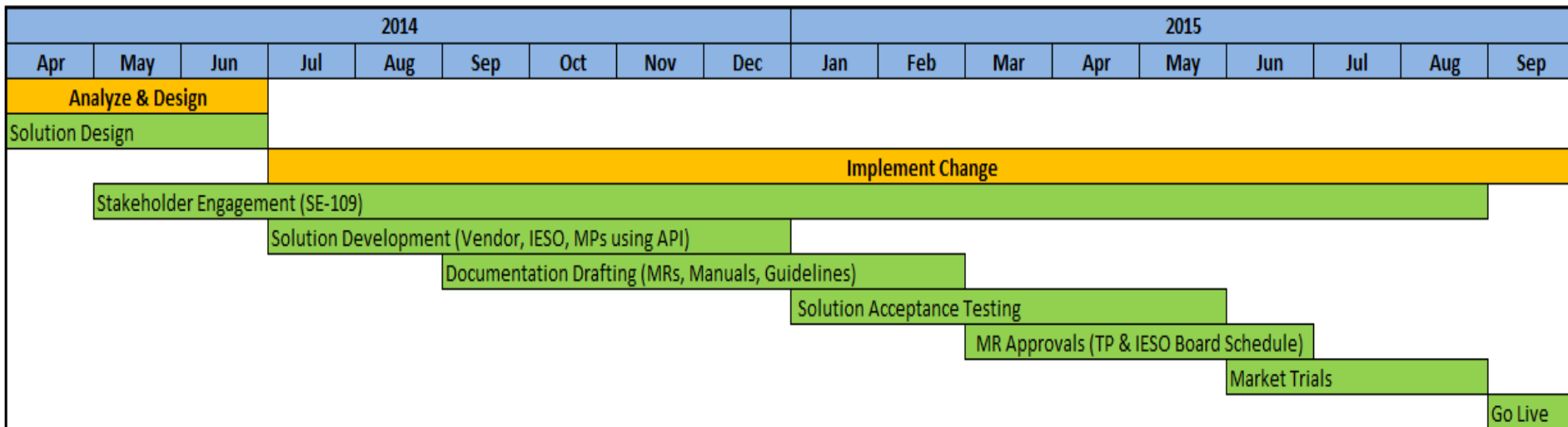
- Equinox Software Design Corporation
- Solid customer base:
 - Mid-West ISO (MISO)
 - ISO New England (ISONE)
 - South West Power Pool (SPP)
 - Alberta Electric System Operator (AESO)
- Software Name = Control Room Operations Window (CROW)
- <http://www.equinox.ca/equinox/products/crow/outagecoord/Default.aspx>

- **Configurable Outage Request Attributes:**
 - Complex Profiles (Continuous, Daily, Weekly, Custom)
 - Multiple Recall Times (Daytime/Nighttime)
 - Priority Codes (Planned/Opportunity/Urgent/Forced)
 - Reason Codes (Maintenance/Replacement/Commissioning/Testing etc.)
 - Status (In-service, Out-of-Service, Derated)
 - Flags (Loss of Redundancy, Process Inclusion etc.)
 - State Transition (Proposed/Submitted/Study/Negotiate/Approved etc.)
 - Comment Fields (Public/Confidential based on permission model)
 - File Attachments Supported (both Web Client/API)
- **Configurable Equipment Model**
 - Multiple Names (Market Participant Name, IESO Name)
 - Equipment Groups (Line Terminal, Station Bus, Station Service)
 - Equipment Lifecycle (Active/Proposed/Retired)

- **Event Handling & Notification**
 - Subscription based notification of approvals/rejections
 - Pre-configured notification for other states transitions
- **Validation Controls**
 - State request button appearance/disappearance (Submit/Cancel)
 - Mandatory field identification
 - Equipment conflict checking
 - Warning messages for business rule violations

- **Configurable rules engine**
 - Auto + manual outage request state validation and transition (to enable the outage process workflow and business rules)
 - Quicker turnaround for potential process changes
- **Intuitive Versioning Features**
 - Outage request changes are tracked and easily retrieved by revision number
 - Changes between versions are easily identified/highlighted right on the outage request form itself

RFP Outcomes: Roadmap for Implementation



MP = Market Participant

MR = Market Rules

TP = Technical Panel

- **CROW software design is already in progress and expected to complete by July 2014**
- **Final Process business rules are first on the design list (discussed next)**

- Business rules (as described in previous slides) will be driven by states that define the life cycle of an outage request from submission to completion.
 - CROW supports auto and manual state transition
- **Available States:**
 1. **Proposed (draft state):** auto-transition by the market participant (MP) on creation.
 2. **Submitted:** manual transition from *Proposed* by the MP (subject to process submission criteria).
 3. **Study:** auto-transition from *Submitted* at the beginning of each assessment period.
 4. **Advance Approval (AA):** manual transition from *Study* by the IESO

Available States (con't):

5. **At Risk:** manual transition from *Study* by the IESO (auto-transition at the end of the assessment period).
6. **Rejected:** manual transition from *Study* by the IESO (auto-transition at the end of the assessment period).
7. **Revoked:** manual transition from *Advance Approval* by the IESO.
8. **Negotiate (change mechanism):** manual transition from any *Study* or *AA* state by the IESO, auto-transition back to the former *Study* or *AA* state after a one-time change by the MP.
9. **Final Approval:** manual transition from *Advance Approval* by the IESO
10. **In-Progress:** auto-transition from *Final Approval* once MP applies an actual start time.
11. **Completed:** auto-transition from *In-Progress* once the MP applies an actual end time.
12. **Cancelled:** manual transition from any state by the MP

- **“Forced” outages cannot be submitted in advance:**
 - Treated as “after-the-fact” in CROW
 - Go directly to “In-Progress” upon entry of an actual start time
 - Actual start times to be entered by the market participant (will apply to all outages)
- **“Urgent” outages can be submitted in advance:**
 - Requests submitted prior to the end of the 1 Day AA assessment/study period will transition into either the *Submitted* or *Study* state depending on whether it is received prior to or during an assessment period.

- **Forced and Planned extensions cannot be managed the way they are today :**
 - No forced or planned extension button
 - A new outage request and ID is required (similar to ONLORF)
- **Proposed Functionality:**
 - Extending an “In-Progress” *Forced* or *Urgent* request can be performed on the existing outage request by changing the end date.
 - Extending an “In-Progress” *Planned/Opportunity* outages requires creation of a new outage request as either *Urgent* (equivalent to forced extension) or *Planned/Opportunity* (equivalent to planned extension)
 - A CROW ‘successor/predecessor’ linking feature is being considered to link the in-progress request to its ‘successor’ extension request.

- **Voluntary submission of ‘non-critical’ outages into the Weekly Process**
 - Initial process proposal called for an “inclusion flag” which would give MPs the ability to either opt in or out of the weekly process
 - Customization required in CROW
 - IESO proposes ‘opting’ in or out based on time of submission
- **Use of a single Submit, Study and Advance Approval State**
 - Easier to manage within CROW as opposed to defining 4 separate sub-states for each process (i.e. Quarterly, Weekly, 3 Day, 1 Day)
 - The process in which the state applies can be derived from the time the outage request entered the state (i.e. an advance approval received 4 months prior to the outage start date implies it was received in the Quarterly process)
 - IESO to verify whether these times can be communicated via the API

Proposed Assessment Methodology: Quarterly Adequacy Assessment Principles

- **Maintain as much consistency with the 18 Month Outlook methodology as possible.**
 - Requires the least of amount of effort to deploy using well-established and understood methodologies
 - Minimizes risk of counter-intuitive signals between the two reports
- **Ensure margins are sufficient to provide and maintain outage approvals through to real-time.**
 - Only one 18-Month “Approved” (i.e. not At Risk) outage has been rejected in the near-term since process inception

- Weekly granularity proposed = 18 Month Outlook
 - Risk: Weekly granularity may be overly restrictive against an outage request with duration < week (since the Quarterly AA has no inclusion criteria)
 - IESO will dive down to a daily granularity if required (i.e. weekly reserve violations are preventing an approval on an intra week outage)
 - For example, a two-day 50 MW generator outage is creating a weekly resource shortfall, but further investigation reveals it is scheduled to occur on the weekend.

Weekly Capacity Surplus/Shortfall (Peak Hour):

= Installed Capacity (available resources),
minus Peak Hour Demand,
minus Outages (unavailable resources),
minus Reserve Requirements.

Installed Capacity (Available Resources)

- Seasonal Ratings from Thermal Units (Nuclear, Oil, Gas, Biomass)
- Monthly Wind and Solar Capacity Contributions
- Weekly Demand Measures (Table A2 from 18M Outlook Tables)
- Monthly median hydro-electric energy production & operating reserve capability over the peak hour

Outages (Unavailable Resources)

- Highest hourly combination for the week considering:
 - Generator Outage Requests
 - Transmission Outage Requests that Bottle Generation
- Source = CROW software database

Peak Hour Demand

- Weekly median normal weather peak hour demand (Table 3.2 from the [18M Outlook Tables](#))

Reserve Requirements

- Higher of [Deterministic](#) vs. [Probabilistic](#) which considers:
 - Operating Reserve
 - Load Forecast Uncertainty
 - Forced Outage Rates

- **May 2 – Stakeholder Feedback Due**
 - Proposed Quarterly Process Assessment Methodology
 - Proposed Software Design
 - Feedback on Interim Process and recommendations for change in the Final 3 Day and 1 Day assessment processes
- **May 9 – IESO Response to Feedback Due**
- **May 22 – Post Materials for the next SE109 Meeting**
- **May 28 – Next SE109 Meeting**
 - Update on Proposed Software Design
 - Update on Proposed Quarterly Assessment Process
 - Update on Final Process Implementation Schedule

Questions/Comments?