California ISO

Operational Challenges – ICCP Best Practices
October 2025

Welcome

Our presentation will begin shortly.

Today's Presenter: Gina Wansor, Manager, Grid User Support CAISO |RC West
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Housekeeping

Keep yourself muted to minimize background noise

Unmute to ask verbal questions or write questions in the chat pod

Raise your hand using WebEx interactivity tools

In this next hour, we'll plan to:

- Review operational impacts associated with ICCP (Real Time Telemetry)
- Learn how another WEIM/RC Entity, Portland General Electric, manages their new resource ICCP implementation to ensure market and reliability visibility
- Have a discussion and brainstorm amongst the stakeholder participants
- Look Ahead and Wrap Up

CAISO | RC West Grid User Support

Operational Impacts
ICCP Best Practices

We'll first look real time telemetry associated experiences or outcomes for real time operations

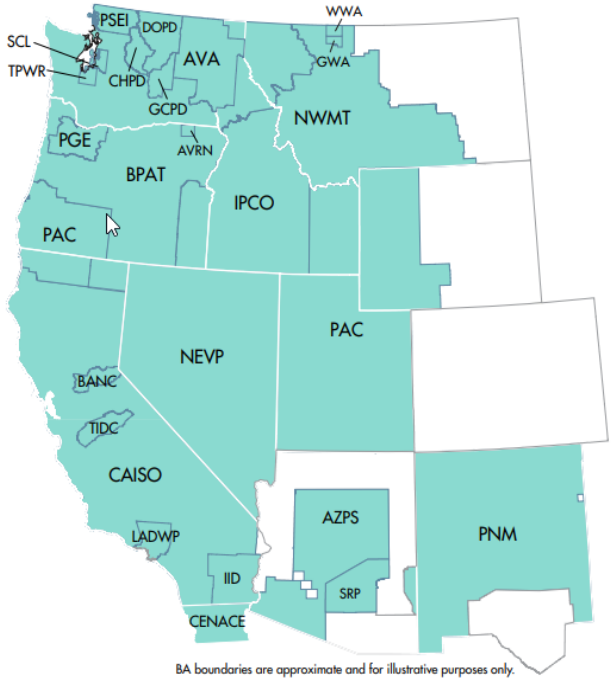
- Introduce the operational role of WEIM and RC West
- Identify potential impacts or outcomes from lack of or inaccurate telemetry and the impact to our collective operations teams
- When ICCP is modeled, identify other areas of diligence to support the most accurate market solution

WEIM creates economic, security-constrained, market-based dispatches in Real-Time and as the Market Operator, the role is to ensure

- WEIM optimizes generation output within each BA area and energy transfer between WEIM participants – built on an optimization across the entire WEIM footprint (Full Network Model). WEIM also allows for managing congestion on transmission lines to maintain grid reliability
- Real Time Market Operators (RTMOs) are responsible for ensuring these market processes run correctly at designated intervals and dispatching resources according to the market's instructions.
- WEIM Entities (Balancing Authorities) who are experiencing discrepancies work with the RTMOs at times to identify issues and if real time adjustments, corrections, or actions needed

RC West oversees grid compliance with federal+regional grid standards and can determine measures to prevent or mitigate system emergencies in real-time operations.

- RC West's role is to **ensure the effective and efficient reduction of risks** to the **reliability** and security of the grid and serves as the reliability coordinator of record for over 40 Balancing Authorities and Transmission Operators in the Western United States.
- RC West monitors energy flows on the system and run contingency analyses on system operations, identifying in real time if there is a current or potential issue in the Western Interconnection and will work with the affected entities to develop and implement mitigation plans
- RC Operators must focus on and think about a lot of different aspects of the grid at once, including their role in providing interconnection wide coordination during system events



As new resources begin to energize, the physical transmission system experiences new or increased flows, potentially new topology, etc.

New generation added off a single point

New generation amidst a larger network of transmission

Variability in output due to fuel type

Variability in output based on testing outcomes

These grid changes require visibility by both the Market Operator and the Reliability Coordinator and their associated software systems for best accurate optimizations and assessments of state.

Lack of valid information can result in incorrect dispatches or incorrect actions taken

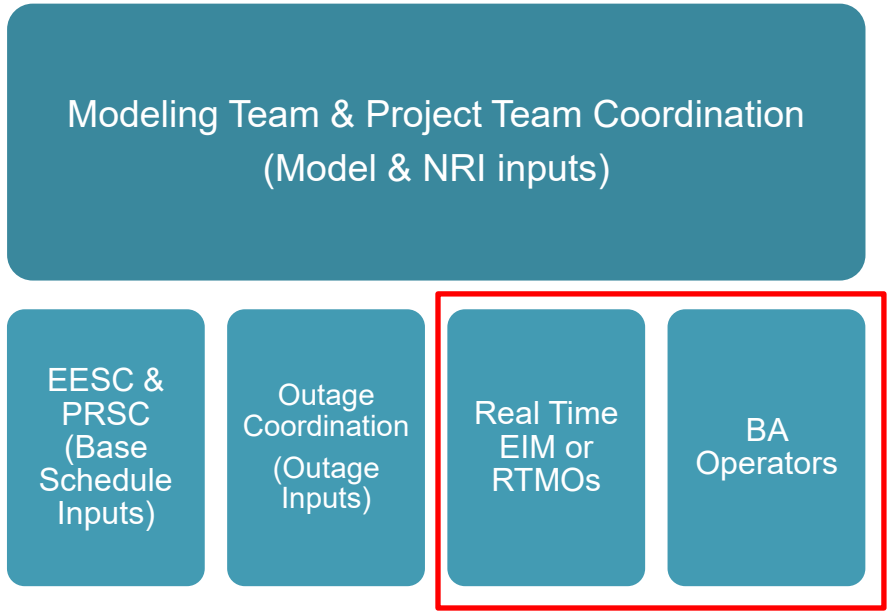
Let's revisit: the model and its supporting information, including ICCP, is leveraged in systems for both WEIM and RC West

Real Time Assessment and Management Tools
- **Market (FMM, RTM) - BAAOP**
- **Real-Time State Estimator, Contingency Analysis - HANA**
- **EMS**

Look Ahead Analysis
- *EDAM/DAM (Future)*
- *Next Day Studies (OPA) – Reliability Planning*
- *Operations Planning*

WebOMS
- *Outages*
- *Temp Equipment Rating Changes*
- *Temp modeling between model cycles (holds for double modeling)*

BSAP/RC-BSAP, ALFS
- *Resource and Load Modeling*
- *Supports future analyses*



Model management is critical to the implementation process and requires coordination throughout the organization (and maybe more!)

When there is no or incorrect ICCP associated with a resource, this can result in incorrect solution or discrepancies in calculations of **the current state of the system,** impacting the reliability view and assessment

- Lack of visibility to line exceedances of their reliability ratings which are protecting to prevent equipment damage or other widespread concerns
- Incorrect calculations of line(s) flow
  - Lower visibility on transmission assets and consequences for loss of another resource or transmission asset
  - Resource may not look like it has a path to flow and reflect as “offline” due to open gen breaker or lack of transmission breaker status
- Over mitigation due to the above

Let’s explore a similar concept!

When there is no ICCP associated with a resource, this can result in incorrect solution, discrepancies in calculation, or incorrect dispatches **for the WEIM**

- Resource inadvertently shown offline and incorrectly calculating balance for the WEIM Entity BA
  - Leading to resource sufficiency evaluation (RSE) failures or inadvertent dispatch
- Relying on hourly “forecasted” static value from base schedules instead of real time variable value and skewing market results due to discrepancy of output
- Lack of visibility to the real time output can show up as deviation
- Incorrect start up or shutdown (thinks it is offline when really online or vice versa)
- False transmission congestion which could result in inadvertent generation movement
- Loss of capability to leverage certain functionality (telemetry following, persistence forecasting)

Potential (and common) scenario…

- RC West identifying an area of concern where ICCP visibility is low
- Performs investigation, often time having to coordinate with the Transmission Operator or Gen Operator
  - Comparing RT values, inputs, ratings, etc.
  - If unable to pinpoint, take conservative action to mitigate concern
  - In the event of a manual replacement in EMS due to incorrect position – the position of the asset becomes “fixed” until removed. Can later result in the same above process repeating.
  - Reduced visibility to overall monitoring

Potential (and common) scenario…

- Customers (SC) may ask why they're receiving the ADS dispatch given or WEIM Entity/BA recognizes odd solution
- WEIM Entity performs investigation
  - May have to (and often do) work with RTMO to investigate further
- WEIM Entity or RTMO has to take a manual action to correct (i.e. manually replace an open/closed position within their EMS system)
  - In the event of a manual replacement in EMS, the position of the asset becomes "fixed" until removed and can later result in the same above process
  - Reduces visibility to overall monitoring

ICCP practice leading to positive reliability coordination and market visibility

Planning

- Submit ICCP to Full Network Model process to be mapped within the Western Interconnection Model (WIM)
  - At least 80 days prior, in accordance with FNM timeline

Energization

- Provide any updated or changed ICCPs for these points (at least two weeks prior)
- Ensure **ICCP point readiness on entity side** prior to energizing
- Ensure CAISO | RC West has **access** to **read** these ICCP Object IDs
- BA should coordinate with TOP to ensure correct topology
  - If ICCP Is not available, manage by TOP/WebOMS

Now let's say you do have ICCP modeled and ready to go – in which case, great! Here are some other areas to make sure to align in your GRDT as you get your resource ready:

- **Pmax & Pmin (in MF/GRDT)** are accurate to what they can show in RT to avoid showing a range that the market does not recognize
  - Could get dispatched to Pmin; for BESS – this could cause swings due to parameter discrepancy and low negative Pmin (and was at high output)

- **Ramp Rate:** if ramp rate is different than actual ramp rate (namely slower in RT vs MF)
  - Could result in a new dispatch as not meeting the value as expected

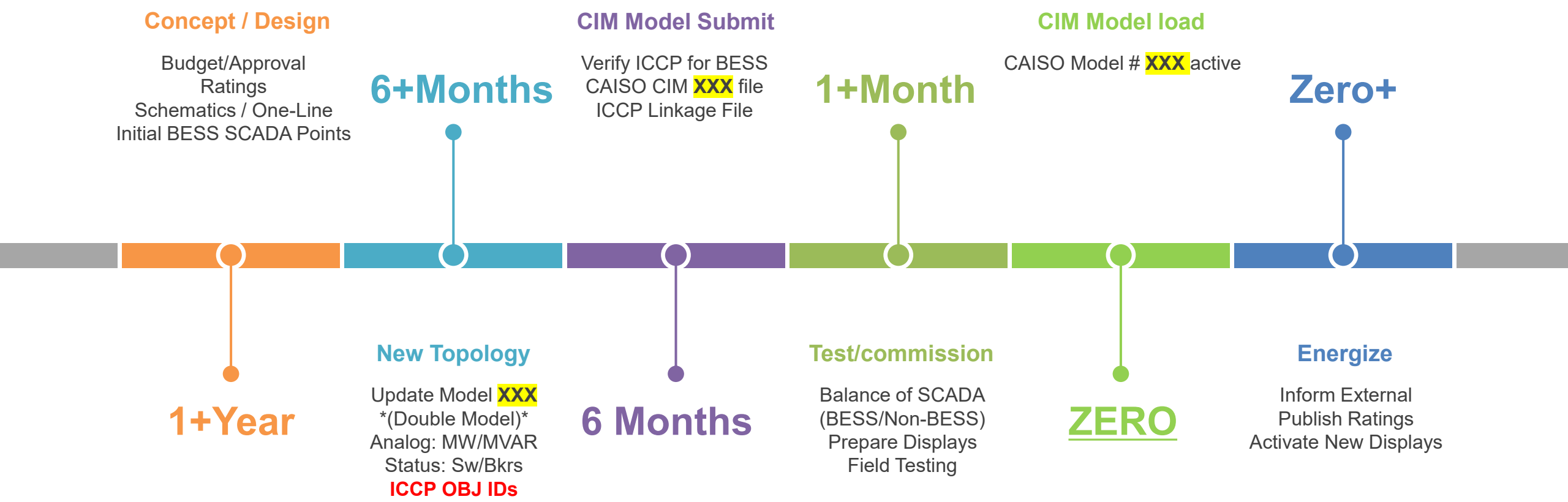
- BESS: Ensure **SOC** values in MF align and within range of physical capability
    - Could lead to a charge or discharge dispatch if not seeing the correct value in accordance with the default parameters

Portland General

ICCP Submission Best Practices

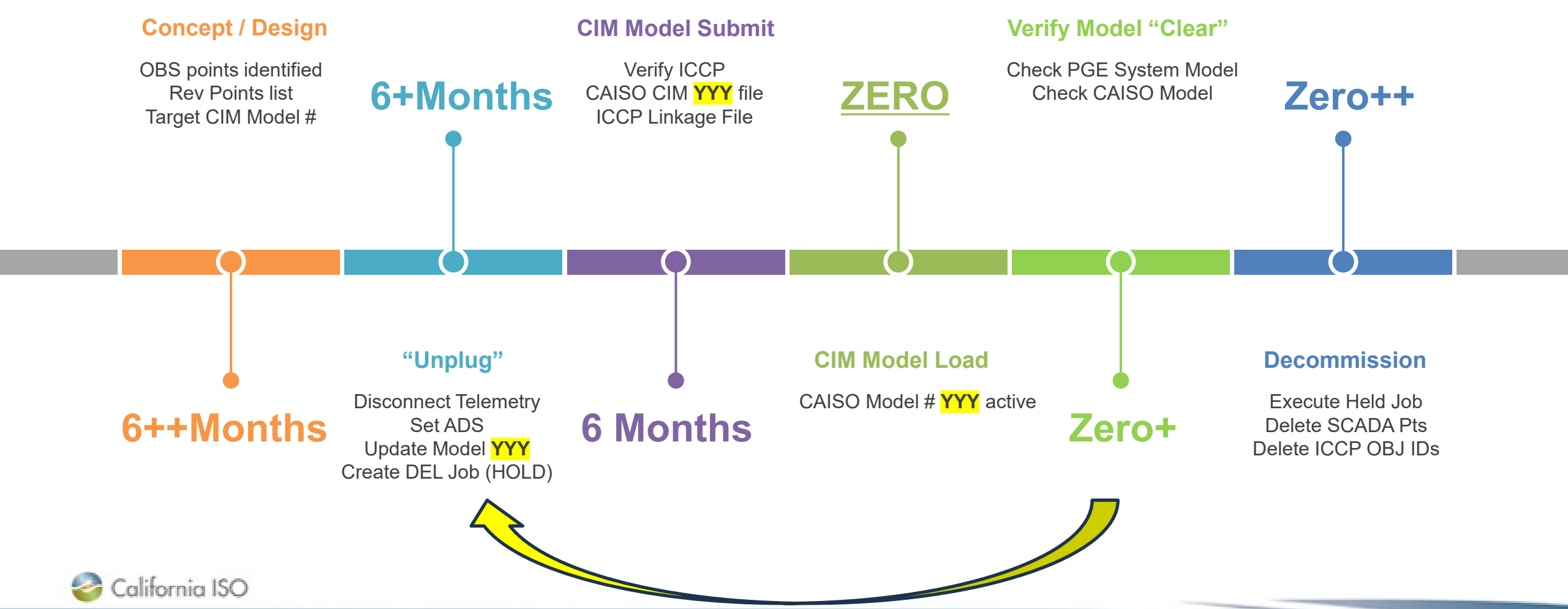
ICCP OBJ ID Timeline

Point commissioning (Add/Modify)



ICCP OBJ ID Timeline

Point Decommission (Delete / OBS)



Round Table: Challenges with ICCP Submission

Idea Sharing: Modeling & Energization Processes with ICCP

- What are some best practices other organizations have identified or implemented to result in successful new resources coming online with visibility shared to the WEIM and RC West?

New Resource Implementation

Are there other challenges or suggestions that you have from learned experiences in real-time when the ICCP was not setup correctly for a new resource?

Grid User Support

Looking Forward

What to know and what you may experience

Processes and Documentation are being looked at for short term support and improvements while longer term needs discussions are being had

- Exploring enhancements for FNM Scope and Validation
  - Pre-FNM Deployment Checks
  - Scope Change Outreach
  - Increased questions from our team
- Energization Pilot Program
  - Submit for ICCP Object ID mapping validation prior to energization
- Documentation Improvements: ICCP Template

Snapshot: ICCP Documentation Improvement Example - Checklist Template for New Resources

Hybrid Resource ICCP Check Out:

- ❑ UGMW
- ❑ UNMW
- ❑ UPMW
- ❑ UAMW
- ❑ UCON
- ❑ SPD
- ❑ DIR
- ❑ BPTMP
- ❑ PAIRD
- ❑ SOC
- ❑ MXENERGY
- ❑ HSLMW

- Clarity on points needed
- Providing these telemetry points w/ the associated model item will increase clarity in the scope request to the FNM Team

As a resource is leading to energize or sync with the grid for initial testing,

- Ensure proper **set up** for resource testing
- **Communicate** within your organization and ours to ensure adequate control and visibility of resources, respectively
- Send in proper **limitations and status**
  - Submit detailed outage cards into WebOMS
- Actively **monitor and manage** your resource

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Thank you!

ICCP Operational Challenges Q&A