

Dynamic assessment of path competitiveness.

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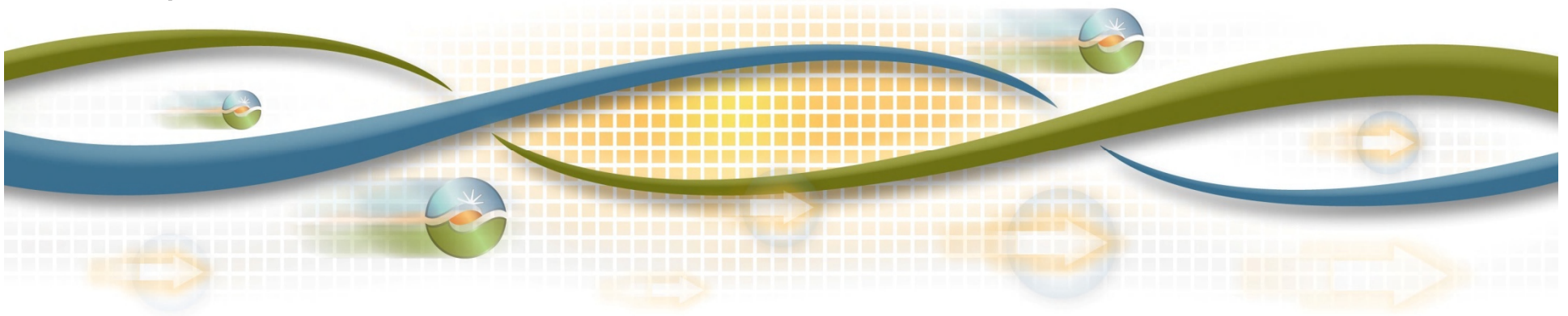
Manager, Market Analysis and Mitigation

Department of Market Monitoring

Market Surveillance Committee Meeting

General Session

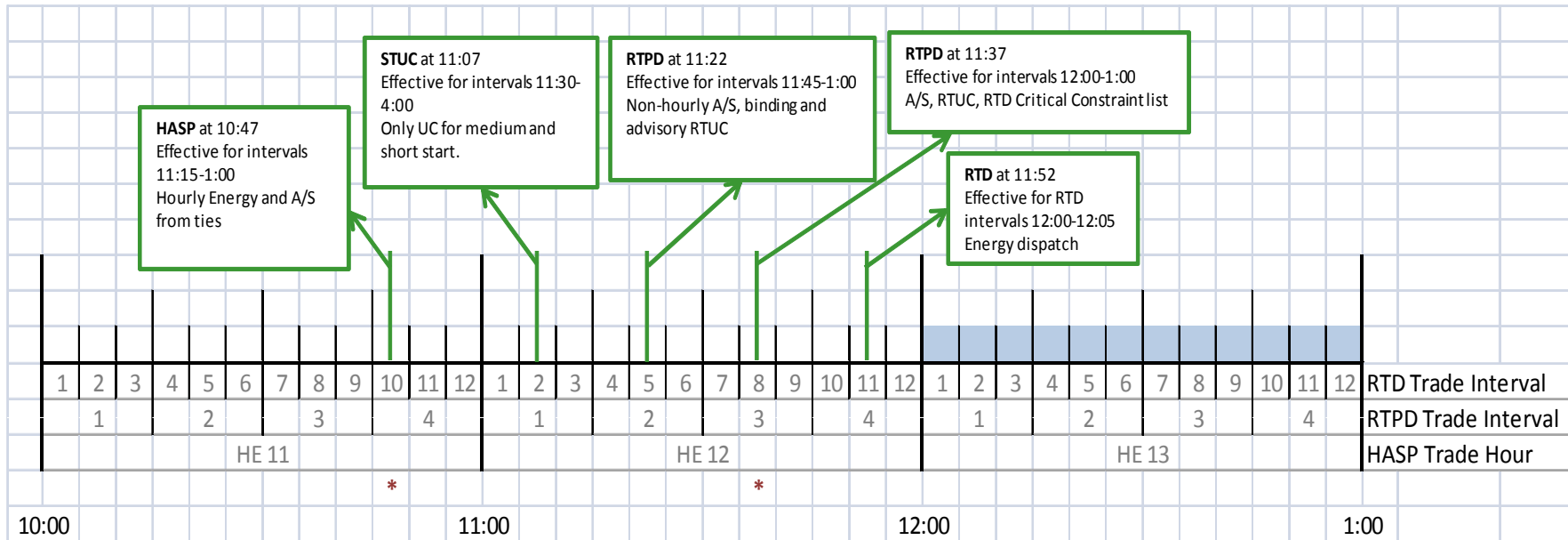
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Summary of proposal for dynamic path assessment.

- Dynamic assessment performed before market runs
 - After all-constraint run in IFM
 - After all-constraint run in HASP (hourly inter-tie market)
 - After ancillary service run before RTD (5-minute market)
- Use three pivotal supplier test to determine competitiveness for each potentially binding constraint.
 - All potentially binding constraints will be tested each market run.
 - Designations will be “Competitive” unless test is failed.
- Assessment include current market and grid conditions.
 - Resource and transmission availability.
 - Test what is likely to bind, not what has historically bound.

Timing and execution of dynamic CPA (real time)



- Highlighted blue hour is actual operation or trade hour.
- Mitigation must cover intertie dispatch (HASP), short-term unit commitment, and internal 5-minute dispatch.\
- Several opportunities for assessment and mitigation.

Identifying potentially binding constraints

- Ability to identify where local market power exists depends on ability to accurately predict congestion.
- Running the “All Constraint Run” (ACR) of the IFM with bid-in demand may improve prediction of congestion.
 - 18% of time congestion occurred in IFM it did not occur in ACR.
- Identifying RTD congestion in HASP can be inaccurate.
 - 17% of time congestion in RTD it did not occur in HASP ACR
 - System conditions change between HASP and RTD.
 - Resource and transmission availability also change.
 - Mitigation for 5-minute dispatch should consider most current information ... run CPA and LMPM after A/S run.

Options for identifying congestion in real time

- Currently ISO uses binding constraints from HASP ACR to trigger mitigation.
 - Most accurate information for the HASP run.
 - Can under-identify congestion on uncompetitive constraints in RTD (an hour lag – 17 percent under-identified).

Options

- Binding constraints for binding dispatch interval.
- Binding constraints + x% of critical constraint list for binding dispatch interval.
- Binding constraints for dispatch horizon.
- Other?

The pivotal supplier test for competitiveness – residual supply index.

- Use the residual supply index (RSI) to determine if there is competitive (effective) supply of counter-flow.
- Remove effective supply of up to three largest net suppliers for each ***potentially binding constraint***.
- If $RSI \geq 1$ then constraint is competitive, otherwise it is uncompetitive.
- Pass tested competitive / uncompetitive designations to LMPM process for potential mitigation.

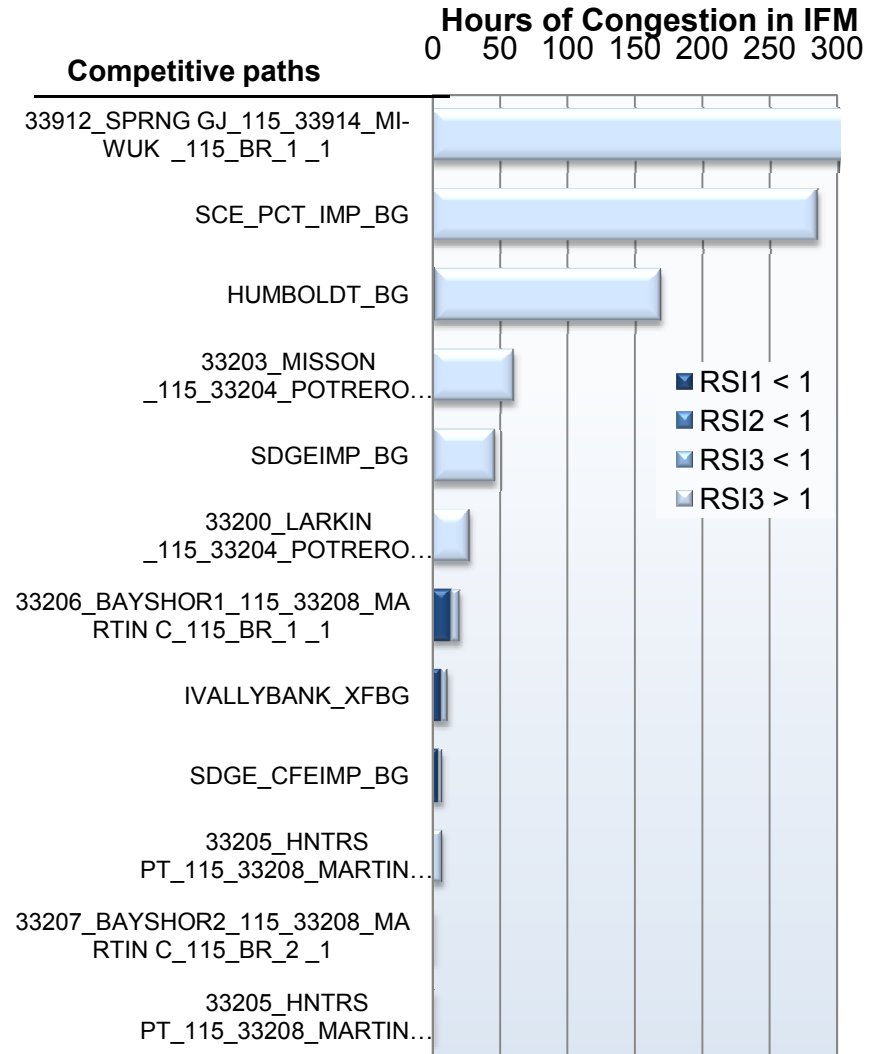
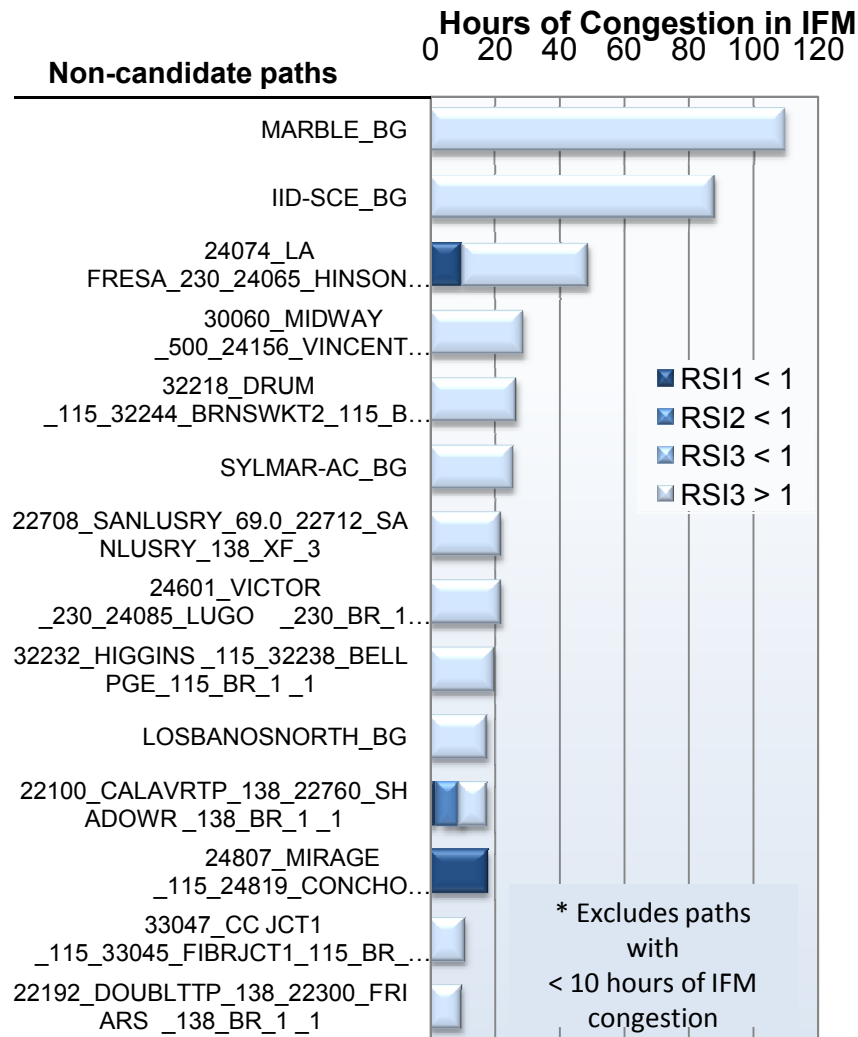
Calculating the RSI

- The residual supply index for a constraint is the ratio of the effective supply of counter-flow without selected suppliers to the demand for counter-flow.
- Effective supply:
 - Only remove effective supply of net suppliers.
 - Accounts for current availability and dispatch level.
 - Reflects current effectiveness from changes in network conditions.
- Demand for counter-flow:
 - Measured using dispatch of effective resources from pre-market run.
- Formulas for calculating the RSI are found on pages 3 and 4 of the DMM paper.

RSI calculations for 2010 competitive paths and untested non-competitive paths (IFM and real time)

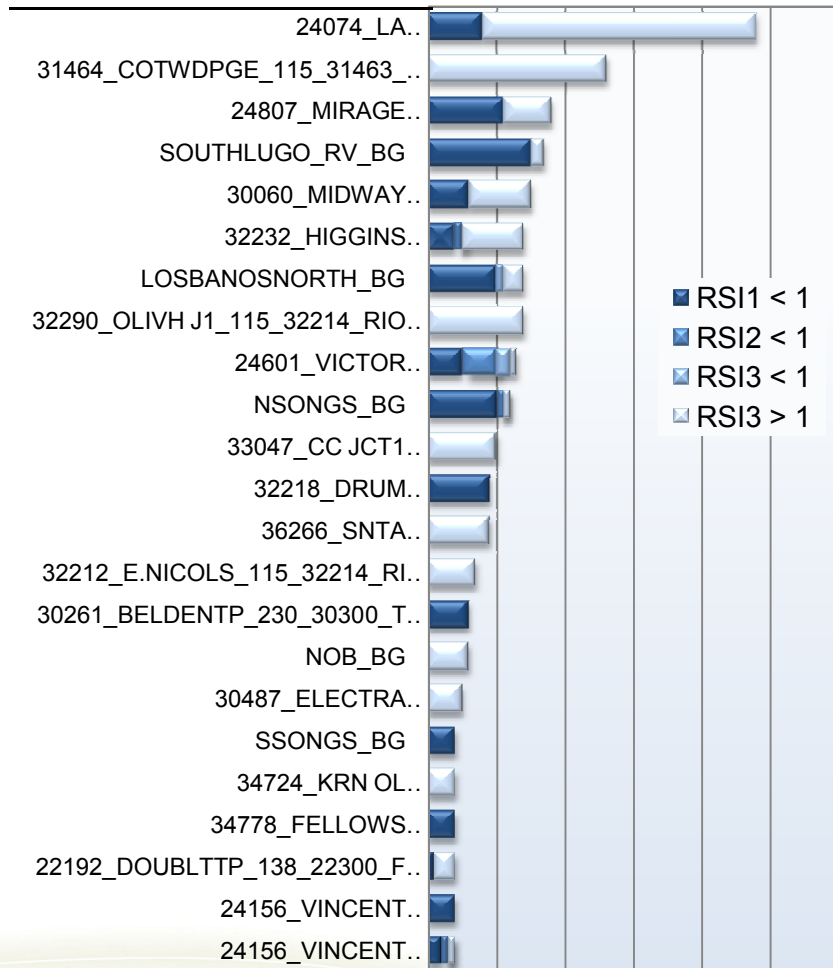
- Day-ahead
 - Few instances of non-candidate and competitive paths with an $RSI < 1$ → More effective counter flow available in day-ahead
- Real time
 - More frequently congested competitive paths have $RSI > 1$ in IFM but show frequent $RSI < 1$ in real time.
 - Non-candidate paths in real time tend to be either competitive or non-competitive nearly 100% of the congested hours.

Frequency of RSI < 1 for IFM

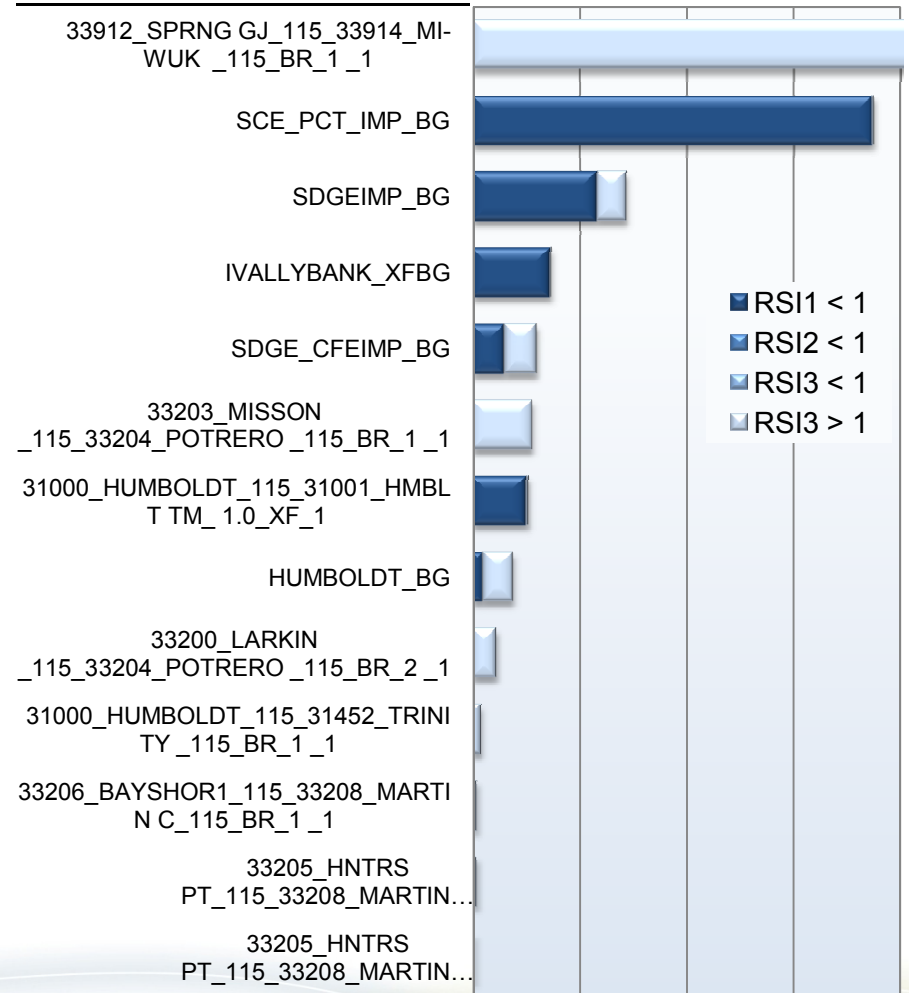


Frequency of RSI < 1 for Real Time

Non-candidate paths Hours of Congestion in RTD



Competitive Paths Hours of Congestion in RTD



Open issues.

- Which set of real time congestion information to use for CPA?
- What to use for path designations if market run fails?
- Include some or all virtual bids in RSI calculation?
- Mitigation (real-time)
 - How to apply results of LMP decomposition test?
 - How to calculate LMP decomposition test for non-binding constraints (if necessary)?
 - For what period are bids mitigated (15-min, hour, etc.)?
 - What to apply in event of failure of LMPM process?