



Joint and Common Market

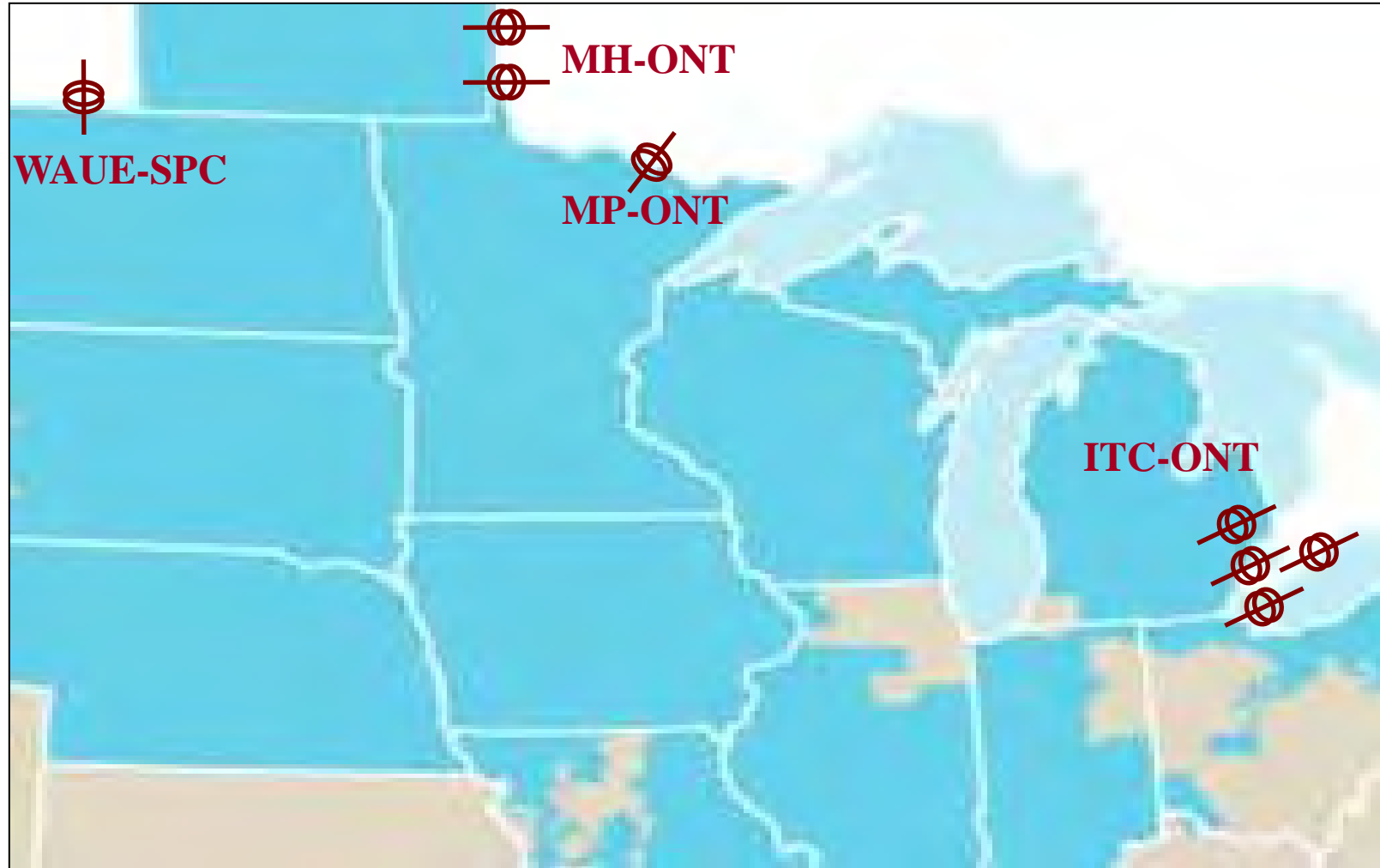
## **2. B – MODELING OF PHASE ANGLE REGULATORS IN M2M PROCESS**



The presentation is informational.

The purpose of this presentation is to provide stakeholders with information regarding modeling of ITC-ONT Phase Angle Regulators (PARs) in the Market-to-Market (M2M) Process.

# REGULATED PARSON MISO SEAM



# PARS CONTROL MODES (IDC)

- Regulate Mode – The Interface is within operational limitations and retains the ability to maintain the Interface Deviation within the Control Band
  - Tags going across the phase shifter are modeled flowing across the phase shifter
  - Tags not scheduled across the phase shifter will see the phase shifter as open circuit and will flow across the rest of the network
- Non-regulate Mode – The Interface has reached Max Tap and the Interface Deviation is exceeding or expected to exceed the Control Band
  - Impacts are calculated using the impedance based on the tap position
- By-pass Mode – The Interface is in the Bypass Mode when the PARs are either:
  - Physically bypassed or;
  - In-service PARs are at or near neutral tap and no attempt is being made to control to the Interface Schedule

Max Tap – The Interface (PARs collectively) has reached the maximum ability to control flow, in either direction

# CURRENT MODELING OF ITC-ONT PARS IN IDC AND M2M PROCESS

- IDC for TLR Purposes
  - PARs are modeled using Regulated mode
  - Reliability Coordinator can change to Non-regulating mode depending on the circulation/loop flows
- M2M Process (Market Flow Calculation and Entitlement Calculation)
  - PARs modeled using Non-Regulated mode
  - For the Entitlement and Market Flow calculations, impacts are calculated using the impedance of phase shifter based on the tap position

# IMPACTS OF ITC-ONT PARS ON ENTITLEMENT AND MARKET FLOW CALCULATION

- If PARs are regulating in real-time, i.e. actual flow across the PARs is equal to schedule flow, PARs are pushing back loop flows across the Lake Erie
- By modeling PARs as non-regulated in Entitlement and market flow calculation, the impacts on certain M2M flowgates will not be reflective of actual impacts.

# MODELING OPTIONS OF ITC-ONT PARS

| Options | Entitlement Calculation   | Market Flow Calculation   |
|---------|---|---|
| A       | Non-Regulated (Free Flowing)  | Non-Regulated (Free Flowing)  |
| B       | <ul style="list-style-type: none"><li>• Regulated unless out-of-service</li><li>• On pre-selected flowgates around Lake Erie, calculate two sets of entitlements – using Regulated and Non-Regulated status</li><li>• Depending on the mode used in IDC in Real-time, use appropriate set for M2M Settlement Calculations</li></ul> | <ul style="list-style-type: none"><li>• Depending on the mode used in IDC in Real-time, model as Regulated or Non-Regulated</li></ul> |

# Questions



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