Building the Energy Markets of Tomorrow . . . Today

# Internal HVDC Controllable Line Scheduling

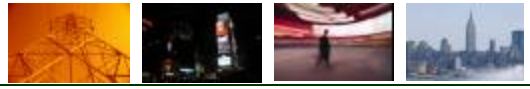
Business Issues Committee

May 19, 2004

Agenda 9

# Conceptual Description

- **Propose to incorporate the scheduling of an internal HVDC controllable facility as described in the Concept of Operations Document and summarized in the following table.**
- **In this proposal, the applicable revenue streams for a facility would be from:**
  - ✓ *Price differentials between the LBMP at the source and sink in the day-ahead and real-time markets and;*
  - ✓ *Capacity payments available to suppliers from the unforced deliverability rights (UDRs) that a facility would provide.*



# Design Characteristics

| Internal HVDC Controllable Line Scheduling | |
|---|---|
| NYISO Actions | ▪ NYISO will optimize and determine the schedule of the facility day-ahead and real-time.<br>▪ All available capacity is subject to optimization in the scheduling tool in day-ahead and real-time.<br>▪ The facility would be under ISO operational control. |
| Merchant Transmission Operator (MTO) Actions | ▪ Provides it's fixed and variable operating cost, if any, for energizing the line and losses.<br>▪ Has an obligation to inform the NYISO of outages or deratings impacting the controllable line.<br>▪ Responsible for ramping of the controllable line to its schedule (possibly hourly, ¼ hourly, every dispatch interval or on request for reliability purposes). |
| Rights Holder Actions | ▪ Requires no scheduling action by the rights holder and value may be realized with no daily interaction.<br>▪ Purchased rights viewed as strictly a financial instrument or as a financial hedge against congestion costs. |
| Energy Market and Settlements | ▪ Payments to the MTO are based on day-ahead and real-time price differences and flows across the facility.<br>▪ Deviations from day-ahead and real-time schedules will be settled at real-time prices and the MTO is financially responsible for non-performance.<br>▪ Settlement with the rights holders is managed by the MTO which provides the MTO the flexibility to structure the terms of its rights contracts as desired.<br>▪ Depending on the scheduling frequency, a production cost guarantee could be necessary to ensure that the MTO is not harmed by real-time prices that are inconsistent with the schedule established for the facility by the ISO.<br>▪ Virtual supply and demand bids using the existing zonal capability open to all market participants would be maintained. |
| Capacity Market | ▪ A facility would be assigned unforced deliverability rights.<br>▪ In-city requirements are determined as if this facility did not exist.<br>▪ Availability of the line and the ICAP generation associated with the UDRs will need to be tracked. |
| TCC Auction | ▪ No TCCs would be sold in the NYISO TCC auction for the facility itself.<br>▪ The MTO may be eligible for awards of expansion TCCs.<br>▪ Purchase of TCCs to and from the injection and withdrawal points of a facility would be permitted. |
| Credit Requirements | ▪ It is likely that a MTO will be subject to credit requirements by the ISO and the necessary requirements will need to determined. |

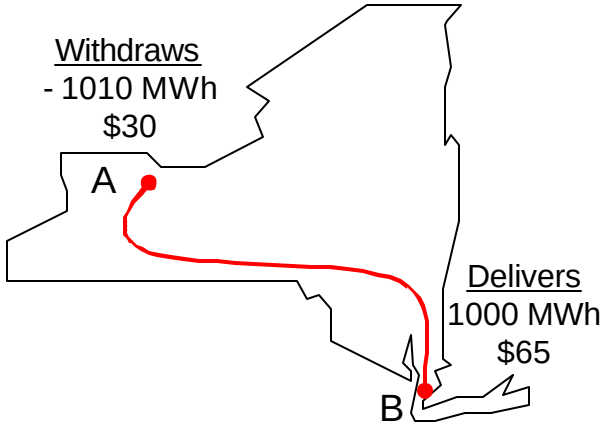
# Example 1: No Deviation In Schedule

Note - These are fictional numbers for illustration purposes only.

Assume:

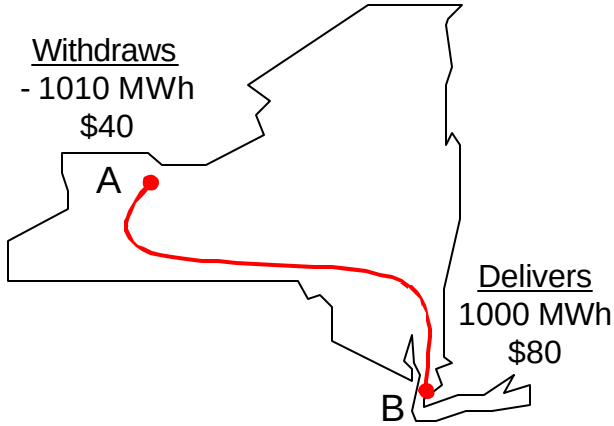
- Single line with a delivery capacity at point B of 1,000 MW.
- ~ 1% losses between injections at A and withdrawals at B.
- Variable cost of operating the line is $2/MWH (incremental conversion losses and O&M costs) and reflects the hurdle rate used by the NYISO in optimizing use of the line.

## Day-Ahead




Day Ahead Revenue = $34,700

## Real-Time




No Deviation from DAM Schedule:
Real-Time Revenue = $0

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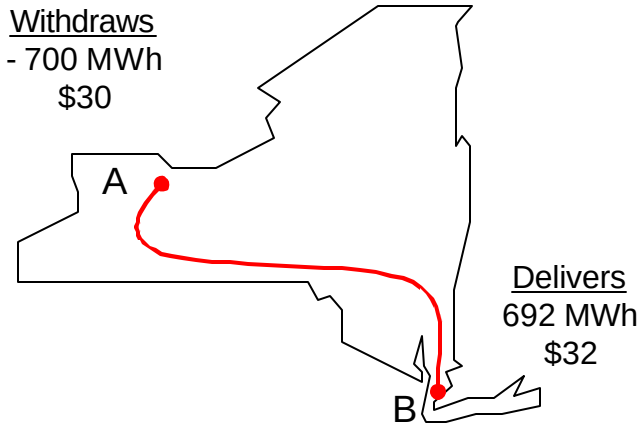
# Example 2: RT Schedule Increase

Note - These are fictional numbers for illustration purposes only.

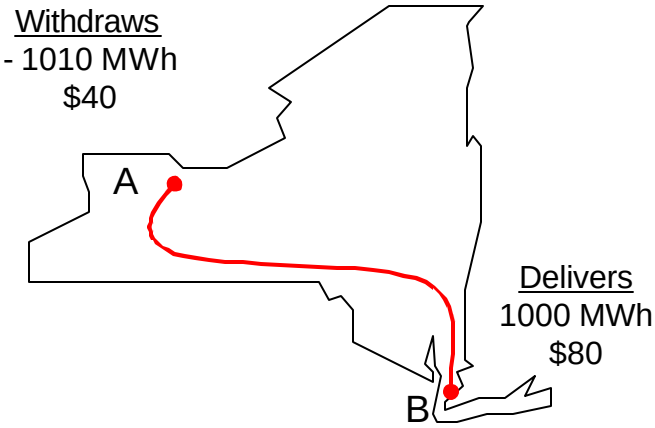
Here, because of the low margin only 700 MWh of injections and 692 MWh of withdrawals are scheduled in the day-ahead market and in real-time, the higher prices cause the line to be fully scheduled.

## Day-Ahead




Day Ahead Revenue = $1,144

## Real-Time




RT Schedule Increases:
Purchases Additional 310 MWh @ $40
Sells Additional 308 MWh @ $80
Real-Time Revenue = $12,240