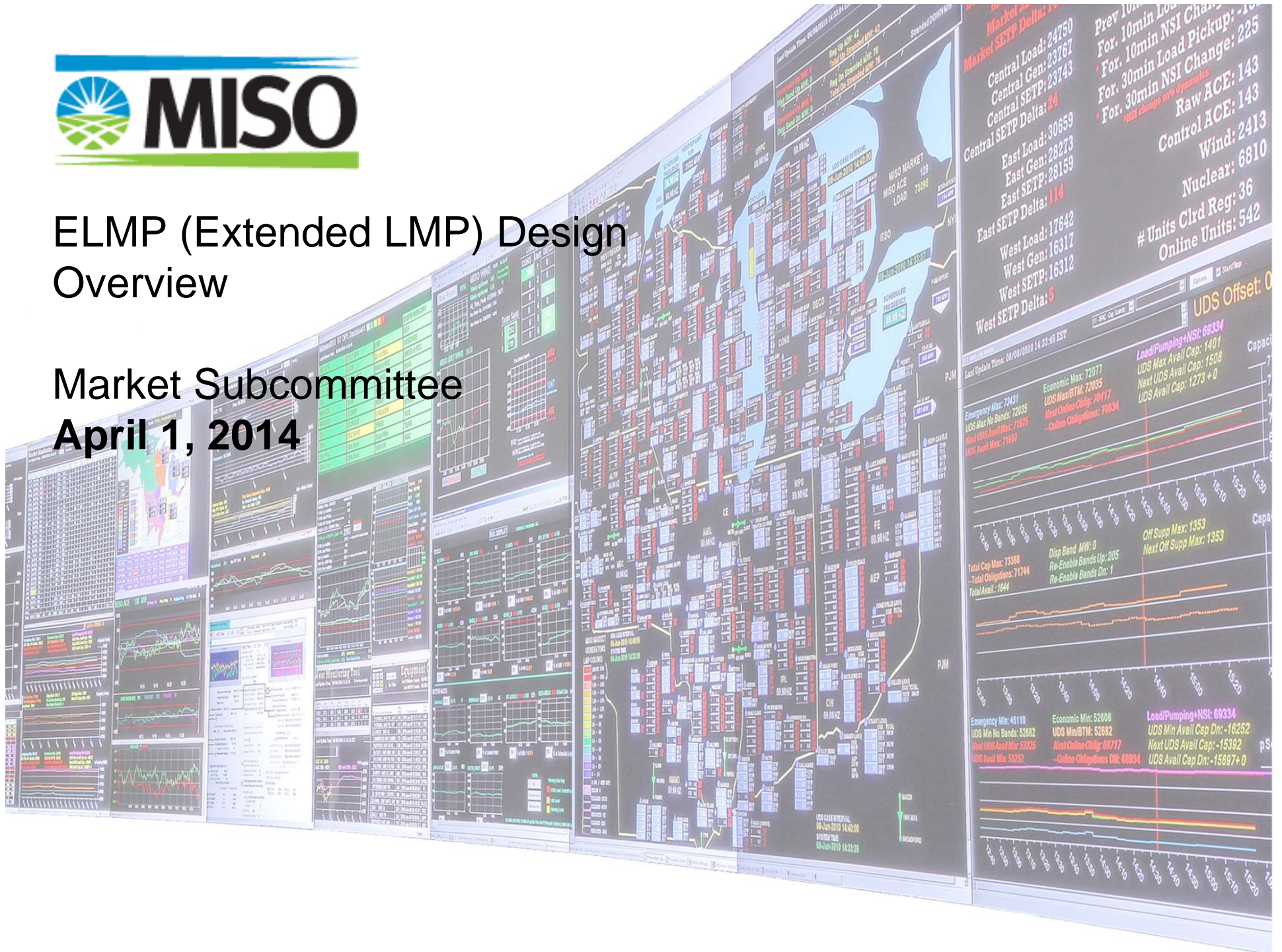




ELMP (Extended LMP) Design Overview

Market Subcommittee
April 1, 2014



Market SETP Delta: 24
Central Load: 24750
Central Gen: 23767
Central SETP: 23743
Central SETP Delta: 24
East Load: 30659
East Gen: 28273
East SETP: 28159
East SETP Delta: 114
West Load: 17642
West Gen: 16317
West SETP: 16312
West SETP Delta: 5

Prev 10min Load
For. 10min NSI Change: -10
For. 30min Load Pickup: 225
For. 30min NSI Change: 143
Raw ACE: 143
Control ACE: 143
Wind: 2413
Nuclear: 6810
Units Cld Reg: 36
Online Units: 542

Emergency Max: 72491
UDS Max No Bands: 72035
Next UDS Avail Max: 71805
UDS Avail Max: 71901

Economic Max: 72077
UDS Max BTM: 72905
Next Online Chng: 70417
-Online Obligations: 70834

Total Cap Max: 73388
-Total Obligations: 71744
Total Avail: 1844

Load/Pumping+NSI: 69334
UDS Max Avail Cap: 1401
Next UDS Avail Cap: 1508
UDS Avail Cap: 1273 + 0

Emergency Min: 49110
UDS Min No Bands: 52682
Next UDS Avail Min: 53025
UDS Avail Min: 53297

Economic Min: 52606
UDS Min BTM: 52682
Next Online Chng: 68717
-Online Obligations DW: 68834

Load/Pumping+NSI: 69334
UDS Min Avail Cap Dn: -16252
Next UDS Avail Cap: -15392
UDS Avail Cap Dn: -15697 + 0

Overview

- **Purpose**

- Review of ELMP design

- **Key Takeaways**

- The calculation of ELMPs does not change commitment and dispatch
- Planned ELMP implementation will provide improved pricing on single interval basis
 - Multi-interval version may be pursued later
- Allows reflection of true cost of energy from fast start units
 - Participation of slow start units will be same as today
- Emergency Demand Response called on by MISO can participate in ELMP

Pricing Intervals and Applicable Resources

- **ELMP method is implemented as a pricing engine based upon existing DA and RT economic dispatch software**
 - DA and RT dispatch are performed on single interval basis
 - One hour for DA and 5 minutes for RT
 - ELMP will be calculated under the same construct
- **Applicable to Fast Start Resources defined as:**
 - Notification time plus start up time less than or equal to 10 minutes
 - Minimum run time less than or equal to 1 hour

Fast Start Resources: Price Setting

- **Start-up, no-load and incremental energy offer costs of such resources will be considered in setting in ELMP**
- **The start-up cost for these resources will be allocated over the resource's minimum run time**
- **Fast Start resources that are block loaded and/or dispatched at limit can set price**
 - The Economic Minimum limit can be relaxed for pricing
- **Allow partial commitment of such resources**
 - Results in reflection of a portion of the total start-up and no-load costs in the price

Fast Start Resources: Online versus Offline

- **Online Fast Start Resources will always be eligible to participate in setting ELMPs under normal operating conditions**
- **Offline Fast Start Resources will participate in setting ELMPs when Security Constrained Economic Dispatch shows reserve scarcity and/or transmission constraint violations**
 - If transmission constraint violations exist without scarcity, only offline fast start resources that can alleviate a constraint will participate in setting ELMPs

Slow Start Resources and EDR

- **Participation of slow start units will remain the same as today**
 - Online slow start units will participate
 - Offline slow start units will not participate
- **Emergency Demand Response (EDR) resources will participate in setting prices in Real Time only when MISO schedules EDR demand reductions**
 - EDR will be treated the same as online Fast Start Resources if MISO calls on the associated EDR

Pricing During MaxGen and MinGen Events

- **ELMP will adopt the same logic as Real Time operation with respect to use of emergency limits under MaxGen and MinGen conditions**
- **Under MaxGen situations, ELMP will use same emergency limits as Real Time dispatch calculation instead of economic limits**
 - The relaxation procedures for Fast Start Resources described earlier will be applied to the emergency limits
- **Under MinGen situations, Economic Minimum limit for Fast Start Resources will not be relaxed**

Summary of Price Signal Improvement

- **Better reflection of the cost of actions by operators to manage brief, transitory deficits in ancillary services or transmission**
- **Block loaded Fast Start Resources and Fast Start Resources dispatched at limits are eligible to set prices**
- **Emergency Demand Response (EDR) resources are eligible to set prices**

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