

Enhanced Integrated Transmission & Capacity Construct (EITCC)

RTEP Plus via Incremental Modifications to the Current Planning Protocols

Overall Objectives

- Provide more robust infrastructure, including major transmission expansion, to support efficient market outcomes
- Reduce likelihood of generation retirements causing reliability concerns
- Facilitate appropriate cost recovery through longer lead times

Modified Local Capacity Construct Summary

Overall Objectives

- Provide sufficient resource adequacy certainty including specific resource availability for planning
- Maintain market process where clearing properly defined products produces an adequate and reliable system
- Resources and load rationally transact to satisfy obligations

High Level Summary of Changes

Change Summary	Common Area	Local Area	
		Non-Local Obligation	Local Obligation
Load	Largely unchanged*		New local sub-obligation
Resource			

*Substantially like today's market with a few modifications including:

- Annual obligation period for the full PY with a final clearing auction (FCA) ran prior to the start of the PY
- Adds regular longer dated voluntary PY auctions while eliminates daily markets

TRANSMISSION under EITCC

RTEP Plus

<u>Feature</u>	<u>Existing Construct</u>	<u>Incremental Modifications</u>	<u>Justification</u>
Planning Horizon	<ul style="list-style-type: none"> • 5 years 	<ul style="list-style-type: none"> • Maintain 5 years for upgrades not requiring longer • Expand to 7-10 years for lengthy projects • Assure consistent planning to maintain deliverability for various local areas 	<ul style="list-style-type: none"> • Better incorporate the time necessary to plan for a major system upgrade, e.g. new 500 kV • Keep shorter lead-time upgrades at 5 years out to reduce forecast uncertainty
Resource Retirement	<ul style="list-style-type: none"> • Studies assume no retirements unless already announced 	<ul style="list-style-type: none"> • Adopt a means of incorporating the probability of unit retirement into transmission planning • Multiple criteria including unit impact on system, relative profitability, operating hours, age, recent investment, licensing status, etc. 	<ul style="list-style-type: none"> • Proactively bolster the transmission system to reasonably anticipate retirements
Local Market Area (LMA) Planning	<ul style="list-style-type: none"> • Not applicable (no local capacity requirement) 	<ul style="list-style-type: none"> • Plan to maintain deliverability and reliability with transmission investment in areas more granular than the LMA taking into account existing and new resource market response 	<ul style="list-style-type: none"> • Prevent further balkanization of the grid • Provide stability on market obligations
Local Reliability Assessment (LRA) (on smaller areas than an LMA, could represent the most granular study area or LDA)	<ul style="list-style-type: none"> • RMR contracts as needed under generator deactivation 	<ul style="list-style-type: none"> • Run LRA 2 years prior to PY for each LDA • Trigger action if cannot maintain deliverability and reliability in any LDA through base transmission plan given existing and new resource market response <ul style="list-style-type: none"> ○ Consider both resources and transmission ○ For reliability PJM pursue focused RFP for additional capacity ○ Capacity could be in the form of returning retired, building new, demand response, etc. ○ Nature of problem and solution drives term of procurement • If need additional capacity procure via contract, then self-schedule or bid in FCA auction at zero 	<ul style="list-style-type: none"> • Focus on narrowly defined problems not resolved (for whatever reason) by the market process <ul style="list-style-type: none"> ○ Forward 2-year look provides time for reliability fix under competitive procurement process ○ Targeted solution for narrow problem • Avoid designing capacity construct around fitting the least competitive area or a legacy transmission problem

TRANSMISSION under EITCC RTEP Plus

<u>Feature</u>	<u>Existing Construct</u>	<u>Incremental Modifications</u>	<u>Justification</u>
Local Capacity Premiums	<ul style="list-style-type: none"> • Not applicable 	<ul style="list-style-type: none"> • Count local capacity premiums as congestion under economic transmission 	<ul style="list-style-type: none"> • Continue integration of transmission into market • Allow transmission upgrades to compete against local capacity through transmission planning
Merchant Transmission Capacity Transfer Rights (CTRs)	<ul style="list-style-type: none"> • Not applicable, only ARR/FTR rights 	<ul style="list-style-type: none"> • Create corresponding CTR to LMA for increased transfer capability • Example <ul style="list-style-type: none"> ○ Existing CETL = 1350 and merchant adds 50 MW ○ Set local percentage based on CETL of 1350 but merchant can use 50 MW of CTR to satisfy local obligation with common capacity • Fix the MW value of the CTR for some period of time like 5-years and then periodically revisit the assigned volume thereafter 	

CAPACITY under EITCC

Modified Local Capacity Construct (MLCC)

Feature	Existing Construct	Incremental Modifications	Justification
Capacity Markets	<ul style="list-style-type: none"> Decentralized and voluntary Fungible system credits Seasonal 3 interval structure 	<ul style="list-style-type: none"> Only run PY and interval auctions Eliminate other shorter auctions Start running each quarter voluntary PY auctions 1, 2, 3, and 4-years out 	<ul style="list-style-type: none"> Discover prices via market process rather than attempt to demonstrate in advance for a particular asset (i.e. net revenue or cost of service oriented process)
Partial Year Flexibility	<ul style="list-style-type: none"> Great deal of flexibility 	<ul style="list-style-type: none"> Run several interval auctions for upcoming PY during 6 months prior to FCA Allow interval auctions (prior to FCA) and/or sub-year bilaterals to be combined/counted as a full annual PY resource (via software) 	<ul style="list-style-type: none"> Enable shorter duration resources to be combined into full year resource in synch with annual commitment period (note does not shorten obligation period or require PJM to clear less than full year) Preserve some flexibility of shorter commitment periods such as partial year commercial operation, seasonal resources, risk of late commercial operation, etc.
Obligation	<ul style="list-style-type: none"> Daily obligation period 	<ul style="list-style-type: none"> Annual obligation period for full PY 	<ul style="list-style-type: none"> Brings certainty to PJM on which specific resources to count on because during the PY (absent acceptable replacement?) cannot de-list, retire, or mothball for convenience
Commitment	<ul style="list-style-type: none"> Daily resource commitment Unless voluntary interval commit, allows deficiency share and restricts delisting 	<ul style="list-style-type: none"> Resources cleared in the FCA <ul style="list-style-type: none"> Commit for entire PY Share in deficiencies 	
Final Clearing Auction (FCA)	<ul style="list-style-type: none"> Daily final clearing auction Load shifts priced via daily clearing price 	<ul style="list-style-type: none"> Run FCA 2 months before PY (earlier OK if after last state auction) LSEs must offer to buy at relevant CDR for the entire PY on the full short volume (if difference between intervals, take largest short) Voluntary resource participation Use FCA clearing price for transfer price for load shifts during PY New resources can offer for full PY 	<ul style="list-style-type: none"> Rationally encourages bilaterals which are vital aspect of price discovery Timing of FCA and those with shorter duration LSE contracts can reasonably manage risk against load shift transfer price
Mitigation for Common Capacity	<ul style="list-style-type: none"> No involved program per se 	<ul style="list-style-type: none"> Apply screens and mitigation (if any) deemed appropriate by MMU <ul style="list-style-type: none"> Nothing new proposed Prices up to CDR expected and accepted 	<ul style="list-style-type: none"> Similar to today's construct and methodology

CAPACITY under EITCC

<u>Feature</u>	<u>Existing Construct</u>	<u>Incremental Modifications</u>	<u>Justification</u>
Total Obligation	<ul style="list-style-type: none"> • Total UCAP obligation based on single IRM • Zonal from 5 CP forecast process (year end spells out upcoming year) • IRM set 1 year ahead 	<ul style="list-style-type: none"> • Total UCAP obligation unchanged • For a PY 3 years ahead, set and fix the IRM for system 	<ul style="list-style-type: none"> • Utilizes proven process and infrastructure • Avoid artificial supply/demand shifts on short notice non-market events
Resource Volume	<ul style="list-style-type: none"> • Frozen EFORD rating for each seasonal interval 	<ul style="list-style-type: none"> • Freeze EFORD for entire PY just prior to FCA 	<ul style="list-style-type: none"> • Synchronizes time periods
Demand Side Response (DSR)	<ul style="list-style-type: none"> • Treated as reduction to load 	<ul style="list-style-type: none"> • Additionally allow as a resource (equal basis as generation) 	<ul style="list-style-type: none"> • Furthers competitive market (e.g. demand elasticity, market power issues, etc.) • EITCC horizon provides greater opportunity for DSR to set price
Deficiency Penalties for Shortfalls for Common and Local Areas	<ul style="list-style-type: none"> • Capacity deficiency rate (CDR) • Levied against deficient LSEs or resource providers • Applied against entire interval (for non-load shifts) • Eligible for share of deficiencies if satisfy obligations and qualify 	<ul style="list-style-type: none"> • Keep current CDR but apply on shortfalls for the entire PY • New resources suffer CDR for duration of late commercial operation during portion of PY (if cleared) unless covered short during interval auction ran prior to FCA • Revisit CDR level if market not clearing or inadequate investment level 	<ul style="list-style-type: none"> • Consequences of failure drive forward looking action to satisfy obligations and clear the market • More substantial penalty since applied for full year and solid premium to net cost of new CT entry (as calculated per RPM) • Strong incentive for both resources and load to transact because an un-cleared resource gets nothing while uncovered load pays the CDR for the entire PY

LOCAL CAPACITY under EITCC

Overall Justification

- Price should signal a growing system or local need and reflect a local area deficiency
- More location based compensation to retain existing resources while reducing sole reliance on system-wide capacity, **LMP**, and generation deactivation rules
- Future nature of local obligation allows market actions to clear specific constraints with sufficient lead-time

Feature	Incremental Modifications	Justification
Capacity Markets & Bilaterals	<ul style="list-style-type: none"> • Add fungible local capacity credits • Adds local unit & local UCCs 	<ul style="list-style-type: none"> • Preserves benefits of liquid product while incorporating desired local element
Common UCAP Product (i.e. non-local)	<ul style="list-style-type: none"> • Load with total UCAP obligation of 200 MW of UCCs in common needs 200 MW common • Resource with 100 MW of UCCs in common has 100 MW common to sell 	
Local Percentage Obligation	<ul style="list-style-type: none"> • For a PY 3 years ahead, set and fix the value <ul style="list-style-type: none"> ○ Inputs are forecasted load level and full CETL transfer into the LMA ○ Output is minimum percentage of total obligation necessary as in-area UCC to achieve reliability objectives • 2005 means full start in PY2008-09 	<ul style="list-style-type: none"> • With expanding transmission capability relative to load in an LMA, the local percentage should be expected to decline • Integrate process with planning so local obligation adjusts with physical grid changes
Obligation Volume	<ul style="list-style-type: none"> • Total UCAP obligation unchanged • Define local UCAP obligation as percentage of total LSE PLC ticket • Satisfied by proper mix of UCCs in a few LMAs 	<ul style="list-style-type: none"> • Utilizes proven process and infrastructure
Discrete Local Obligation	<ul style="list-style-type: none"> • Treating local obligation as a discrete requirement • Load with total UCAP obligation of 200 MW of UCCs PLC in LMA with 40% local needs 120 MW common and 80 MW local • Resource with 100 MW of UCCs in LMA has 100 MW of local (which also covers common) to sell 	<ul style="list-style-type: none"> • More intuitive • Avoids requiring higher purchase volume which depending on CDR could make more expensive

LOCAL CAPACITY under EITCC

<u>Feature</u>	<u>Incremental Modifications</u>	<u>Justification</u>
Local Market Area (LMA) Selection	<ul style="list-style-type: none"> • Add specific local sub-obligation for two (2) LMAs <ul style="list-style-type: none"> ○ Eastern MAAC ○ Southwestern MAAC • Treat resource “location” consistent with determination under RPM for various LMA definitions • Provide not less than 5-years notice (absent extraordinary circumstances) to add a new LMA or modify an existing LMA <ul style="list-style-type: none"> ○ Changes through formal PJM led stakeholder process 	<ul style="list-style-type: none"> • General LMA criteria include <ul style="list-style-type: none"> ○ Logical technical and investment areas ○ Reasonably sustaining in nature so commercial stability ○ Possess some degree of homogeneity (e.g. population density, development costs, barriers to transmission and/or generation investment) ○ Balance price separation in smaller area with reasonable supply diversity ○ Logical commercial boundary for transactions • Transmission (with time) and generator deactivation rules (in the interim and future for outlier events) captures the balance and makes broader LMA areas acceptable
Mitigation of Local Capacity	<ul style="list-style-type: none"> • MMU screen each LMA for competitiveness as proposed under RPM (net position) <ul style="list-style-type: none"> ○ If competitive, voluntary resource participation and unmitigated offers ○ If not competitive, voluntary resource participation and mitigated offers (similar to RPM approach) on existing ○ Prices up to CDR expected and accepted • New resources no offer or bid restrictions <ul style="list-style-type: none"> ○ If in mitigated auction, not subject to offer caps for 4-years (comparable equivalent to RPM) 	<ul style="list-style-type: none"> • Similar to RPM approach • Appropriate favorable treatment on new resources

MISCELLANEOUS under EITCC

<u>Feature</u>	<u>Incremental Modifications</u>	<u>Justification</u>
EITCC Start Timing	<ul style="list-style-type: none"> • Start new model for PY 2007-08 • Means only 2-year lead time on IRM and local percentage for first PY • PY 2006-07 remains under existing 	<ul style="list-style-type: none"> • Starts EITCC as soon as practical • Likely compatible with approaches taken for existing SOS auction contracts
Legacy Contracts	<ul style="list-style-type: none"> • Today's credits comparable to common capacity • Unit's location defines the UCC characteristics (i.e. common or local) 	<ul style="list-style-type: none"> • Implementation starts 3-years out so should be non-issue or small issue for state SOS auctions • Otherwise primarily commercial issue between respective buyer and seller on a longer term bilateral

BACKSTOP to EITCC

<u>Area</u>	<u>Actions</u>	<u>Justification</u>
Overall System	<ul style="list-style-type: none"> • Every year assess and announce <u>projected</u> resource adequacy for the next 2-years where resources = existing + new (likely) + DSR (likely) – retirements (likely) • If sufficient, market can and will clear • Trigger actions if projected short each of the next 2-years <ul style="list-style-type: none"> ○ Investigate to determine if “sustaining” or “blip” ○ Pursue appropriate solution if necessary <ul style="list-style-type: none"> • Could include revisiting the CDR rate 	<ul style="list-style-type: none"> • Proactively assess any potential problems (without artificially interfering with market process) • Avoid being in position to not be able to respond • NOT EXPECTED to play a prominent role in actual investment given proven success in PJM market in attracting resources (and EITCC improves price signal in select areas)
Specific LMA	<ul style="list-style-type: none"> • Perform same 2-year forward looking analysis on each LMA focusing on in-area <u>projected</u> resource adequacy and announce study results • If sufficient, market can and will clear • Trigger actions if projected short each of the next 2-years <ul style="list-style-type: none"> ○ Investigate to determine if “sustaining” or “blip” ○ Pursue appropriate solution if necessary <ul style="list-style-type: none"> • Could include revisiting the CDR rate 	

Enhanced Integrated Transmission & Capacity Construct (EITCC)

ITEMS to more FULLY DEVELOP under EITCC

None

ITEMS for OTHER WORKING GROUPS

Transmission

- Develop methodology to count local capacity premiums as congestion under economic transmission
- Develop protocol for assessing resource retirement impact relative to time horizon studied

ITEMS for ELSEWHERE if NECESSARY

Operational parameters

- Belief that more market-oriented approaches external to the capacity construct are more appropriate to address operational issues (which can be dealt with at another time)
 - Evaluate need after development a suitable unit commitment cost model for multi-unit combined cycles (currently in progress?)
 - Further consider whether offer flexibility sufficient (e.g. only allowing market based start charges to change twice a year, failing to allow units to price multiple starts or dispatches at a different price on a given day, etc.)
- Expectations are that load following issues can be readily addressed in the existing energy markets without sub-hourly settlements