

# ***JCM Initiatives Review***

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**Joint and Common Market  
Working Group Meeting  
Wilmington, DE  
September 21, 2005**





# Overview

## JCM Overarching Objectives

A group of initiatives that are intended to result in achievement of the following objectives have been identified in a series of stakeholder sessions:

- *Provide the highest level of inter-regional reliability.*
- *Deliver the lowest cost energy and ancillary services to load across the combined MISO and PJM regions.*
- *Plan, build and operate the combined MISO and PJM transmission facilities for maximum joint benefit across the region.*

Each initiative will be assessed in a cost / benefit analysis and the results presented back to stakeholders for implementation decisions.

# Process Overview

**Convergence of Business Rules** – Both MISO and PJM believe that this is a means to an end, not an end unto itself. As both markets evolve, best practices will be determined and implemented. It is the elimination of inefficiency that will ultimately drive which business practices that the MISO and PJM markets evolve to.

**JCM Candidate Initiatives** – Both MISO and PJM believe that we are considering all the stakeholder ideas that have been submitted. For these initiatives, we have assessed possible implementation costs and developed reasonable implementation timeframes.

**JCM Benefits Determination** – Both MISO and PJM believe that we have attempted to assess benefits by estimating the amount of increased market efficiency, though estimation of production cost savings associated with increased transaction volume across the border, and by estimating Participant staff time and training savings that may be associated with the Candidate Initiatives. Also, the Joint Operating Agreement between PJM and MISO has already obtained many JCM reliability related benefits (improved congestion management; better information flow; and greater operational coordination).

**JCM Costs Determination** – Both PJM and MISO believe we have attempted to assess costs accurately. Those items that are presently proposed to be in the FERC filing are the most accurate. We are less confident in those that are still being considered for inclusion in the filing. We have the least confidence in those that are not presently being considered for the filing. They may be magnitudes of orders different than depicted in this document (possibly low estimates at this time).

**Individual Stakeholder Reviews** – At this time, all the proposals contained in this document must be considered preliminary. It needs to be recognized that all JCM initiatives will require stakeholder review and approval from the committee's responsible for each of the particular initiatives at MISO and PJM, and ultimately may require board level approval before any efforts can commence.

## Initiative Overview – Color Code

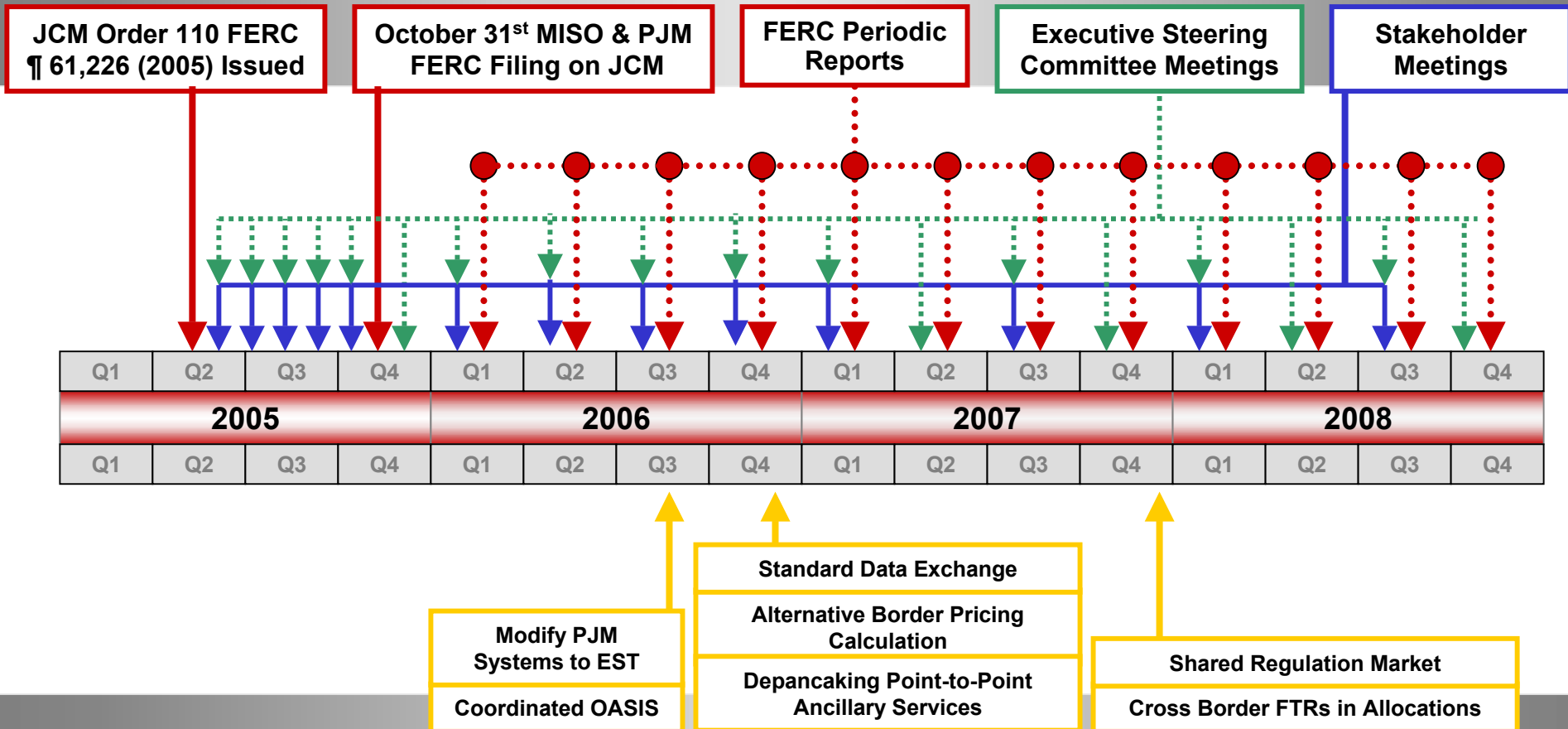
- **GREEN** – PJM and Midwest ISO will commit to initiating the stakeholder processes and other tasks necessary for implementing these initiatives in the October 31st JCM filing. A cost/benefit will be provided and an implementation roadmap will be developed to indicate what must be done to complete the implementation, what the critical dependencies are, and the key milestones to be achieved.
- **YELLOW** – Certain initiatives have been identified as potential additional elements to the JCM; however, further evaluation of these initiatives is required to determine if it will be recommended for implementation as part of the JCM. A preliminary cost/benefit analysis and a roadmap describing the remaining effort required to complete the study will be provided.
- **RED** – The October 31st JCM filing will indicate that these initiatives do not appear to be justified under current conditions and are not recommended for further consideration at this time. Rationale for not recommending these initiatives for further consideration is provided.

# Joint and Common Market Initiatives

		2006		2007		2008			
Commercial	1	FTR Market Convergence	Alignment of FTR Timelines and Products (Note: All MISO cost)	\$600,000			Cross Border FTRs in the allocations	\$4,000,000	
							Cross border FTRs in auctions	\$8,000,000	
	2	Price Rationalization and Convergence at the Border	PJM implementation of marginal losses (Note: All PJM costs)	\$600,000	Alternative Border Pricing Point Calculation	\$200,000			
	3	Reduce Hurdle Rate	Alignment of PJM Operating Reserves and MISO Revenue Sufficiency Guarantee (Note: All MISO cost)	\$600,000	Depancaking of PTP ancillary services (Control Area Services, T.O. Control Center Services, Reactive, Black Start)	\$400,000			
	4	Broader Price Transparency and Common Reporting	Existing MISO & PJM Websites Linking of sites	\$500,000	Standard Data Exchange (Web Services) LMPs, Contingencies, Loads, Dispatch Signals, Outages, Emergency Event/Notifications	\$3,000,000	Implementation of single MISO & PJM Website (Websites for individual RTOs go away)	\$750,000	
			Common Search Capabilities Data Available at Both Sites (LMPs, Tie Flows, Loads)	\$200,000					
			New Joint Website to Host Joint meeting and Events Calendar, Joint Documents and Reports	\$600,000					Standard Data Visualization and Reporting Portal Create a single MISO & PJM Data and Report Portal
5	Increased Market Opportunities	Moving JOUs between markets	\$100,000			Shared Regulation Market	\$8,000,000		
6	Operational Consistency	Common Long Term Transmission Queue	\$200,000	Common Time Zones (Note: All PJM cost)	\$5,000,000	Single Resource Adequacy Solution	\$8,000,000		
		MISO Ramp Viewer (under way)		Central location to view both ramp viewers	\$100,000	Common Ramp Portal	\$750,000		
		Alignment of OASIS Business Practices	\$500,000	Reserve Sharing	\$8,000,000				
		Coordinated OASIS	\$1,200,000						
		Single OASIS	\$8,000,000						
	Common Treatment of Dynamic Schedules/Pseudo-Ties	\$200,000							
7	Single Market	Year 1 - Rule Alignment & Market Portal Design	\$15,000,000	Year 2 - Initial Market Portal Implementation	\$40,000,000	Year 3-5 - Implementation of Single Market	\$50,000,000		
Relia	1	Emergency Energy Agreement	Alignment of Agreements and Practices	\$100,000					
	2	Black Start and Restoration		Alignment of Agreements and Practices	\$500,000				
Plan	1	and Common Deliverability Studies	Alignment of Agreements and Practices	\$120,000					
Total			2006	\$4,320,000	2007	\$600,000	2008	\$750,000	

# JCM Reporting and Analysis Timeline

## Oversight and Reporting



## Cost/Benefit Analysis Completion Decision Points



# Cost/Benefit Analysis

### 1) **Benefits calculated based upon:**

- Estimated reduction in production costs achievable with single market (conservative)
- Feedback from Participant Survey
- Direct contact with Participants relating to potential benefits

### 2) **Each JCM initiative was allocated a percentage share of the production cost savings:**

- Larger share allocated to initiatives with the potential of creating increased transactions volumes

### **3) Staff time savings and reduced training time were estimated for each initiative:**

- No definitive \$ benefits were provided by any Participants
- Estimates are meant to be conservative

### **4) Total benefits were compared to costs over a three year period:**

- Target is three year payback to coincide with recovery of capital expended

# Summary of Cost/Benefit Input Assumptions

Initiative	Market Efficiency Share - %	Reduced Training hrs/year	Staff Time Savings minutes/day (FTE - \$120 k/year)	Number of affected Participants
Alignment of FTR Products	2.0	40	20	80
Alignment of PJM OR and MISO RSG Charge calculations	6.0	0	0	80
Common Search Engine	0.0	0	10	150
Link eData and PTP sites	0.5	10	25	80
Joint Website	0.0	0	10	150
Standard Data, Visualization & Reporting	1.0	60	45	80
Central Ramp Viewer	1.0	0	15	80
Common Ramp Portal	1.5	0	25	80
Common LT Trans. Q	1.5	0	10	20
Align OASIS Business Practices	1.0	10	10	80
Coordinated OASIS	4.0	10	20	80
Single OASIS	7.0	20	25	80
Modify PJM Systems to EST	1.0	15	4	80
Common Treatment of Dynamic Schedules	0.5	5	0	80

## Calculation of Market Efficiency Gain

- 1) Market Efficiency Gain calculated as expected reduction in production cost due to increased transaction volume at the border
  - Proxy estimate for single market production cost reduction
- 2) Estimated based upon actual hourly data from 4/01/2005 through 7/31/2005
  - Hourly differences in proxy bus prices (absolute value) for both Day-Ahead and Real-Time
- 3) Calculated estimated market efficiency gain for both Day-Ahead and Real-Time
  - 50% of the hourly difference in proxy bus prices multiplied by assumed increase in transaction volume

## Calculation of Market Efficiency Gain

Transaction volumes vary based upon amount of proxy bus price difference:

Price Differential	MWH
>\$3 <= \$5	150
>\$5 <= \$10	300
>\$10 <= \$20	500
>\$20 <= \$30	750
>\$30 <= \$40	1000
>\$40 <= \$50	1500
>\$50	2000

## Calculation of Market Efficiency Gain

- 4) Estimated market efficiency gain calculated using real-time proxy bus prices:
  - \$14.7 Million for 4 month period
  - \$44.0 Million annually
- 5) Estimated market efficiency gain calculated using day-ahead proxy bus prices:
  - \$5.1 Million for 4 month period
  - \$15.1 Million annually
- 6) Day-ahead and Real-Time Market values are not additive
  - Day-ahead and Real-Time markets interact with each other

## Proxy for Production Cost

- 7) Estimated market efficiency gain calculated as \$20.9 Million annually:
  - 80% Day-Ahead, 20% Real-Time weighting
- 8) Estimated market efficiency gain is conservative
  - Verified assumed transaction volumes against PJM cost curve
  - Cost curves indicate that a higher transaction volume would be required to converge prices

## Proxy for Production Cost

### EXAMPLE:

- PJM Border Price: \$95.0/Mwh
- MISO Border Price: \$83.0/Mwh
- Transaction volume increase from MISO to PJM of 500 MWs
- Prices converge to \$89.0/Mwh
- MISO production cost increase =  $500 * (89.0) = \$44,500$
- PJM production cost reduction =  $500 * (95.0) = \$47,500$
- Net reduction in production cost =  $\$47,500 - 44,500 = \$3,000$
- 50% of  $(95 - 83) * 500 = \$3,000$



# Commercial Initiatives



		Short-term	Long-Term	
<i>Deliverable</i>		<b>Alignment of FTR Timelines and Products</b>	<b>Cross-Border FTRs in Allocations</b>	<b>Cross-Border FTRs in Auctions</b>
<i>Overview</i>	To the greatest extent possible, provide a single data entry point and results distribution capability for MISO and PJM FTR allocations and auctions.			
<i>Description</i>	Align Timeframe over which the FTR annual allocations/auctions are accomplished	Align the process by which FTRs/ARRs are allocated in the two markets.	Align the process by which FTRs/ARRs are auctioned in the two markets.	
<i>Value Proposition</i>	. Alignment of the timeframes, products and processes between the MISO and PJM FTR allocations/auctions will provide participants with greater certainty with regard to hedging congestion costs when transferring energy between the two markets. Inclusion of cross-border products in the allocations and auctions would allow participants the ability to complete an entire path with one request, and could eliminate the uncertainty associated with partial-path awards.			
<i>Cost</i>	<i>Implement</i>	\$600K (Note: All MISO Cost)	\$4M	\$8M
	<i>Ongoing (annual)</i>	\$0	\$250K	\$500K
<i>Obstacles</i>	1) Current FTR processes are significantly different. 2) Stakeholder agreement is required prior to changing the existing processes to be better aligned. 3) Addition of cross-border products in the allocations cannot move forward until the products and processes are aligned. 4) Addition of cross-border products in the auctions may not be technically feasible at this time due to the size of the combined model and the complexity of the optimization required.			
<i>Action Plan to address obstacles</i>	Identify the differences and develop ways to work around or at least communicate these differences to the stakeholders and gain agreement on best practices.			



**Align MISO FTR products with PJM FTR products. Align MISO FTR allocation and auction timeframes with PJM FTR allocation and auction timeframes.**

*Assumptions*

- ✓ Capture 2.0% of est. market efficiency gain
- ✓ 40 hours/year in reduced training time
- ✓ Time savings of 20 minutes/day
- ✓ 80 Participants

Cost/Benefit	2006	2007	2008	Total
Cost Recovery	( \$200,000 )	( \$200,000 )	( \$200,000 )	( \$600,000 )
On-going operating costs	( \$0 )	( \$0 )	( \$0 )	( \$0 )
Market Efficiency Benefit	\$418,270	\$418,270	\$418,270	\$1,254,811
Participant Staffing and Training Savings	\$584,615	\$584,615	\$584,615	\$1,753,846
<b>Net Benefits</b>	<b>\$802,886</b>	<b>\$802,886</b>	<b>\$802,886</b>	<b>\$2,408,657</b>

Start :2006	2006				2007				2008				
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	
Assign team and create detailed project plan													
Review & compare FTR timeframes and product features, select best practices, determine required changes to MISO policies, procedures, applications and systems, estimate cost and scheduled to implement.													
Review with stakeholders and obtain regulatory approval.													
Modify policies, procedures , applications and systems as needed and test changes.													
Provide training & implement changes.													

**Key Milestones:**

- ◆ (1) Alignment of product elements.
- ◆ (2) Review best practices w/stakeholders
- ◆ (3) Modifications complete
- ◆ (4) Implementation complete

**Critical Dependencies:**

- ▲ MISO Stakeholder agreement on FTR best practices.
- ▲ Regulatory approval.

Align the process by which FTRs/ARRs are allocated in the two markets.

Start :2007	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan												
Determine how the PJM and MISO allocation processes must change to create alignment. Define the business rules for resolving differences in SFT results.												
Perform detailed cost/ benefit analysis of required modifications to allocation processes and develop implementation plan.												
Review results with stakeholders.												

**Key Milestones:**

- ◆ (1) Cost/benefit Analysis Complete
- ◆ (2) Analysis reviewed with stakeholders and go/no-go decision made

**Critical Dependencies:**

- ▲ Alignment of MISO FTR time frames and product features with PJM complete.

**Initiative Description** : Implement a process to either include cross border FTRs in the individual MISO and PJM FTR auctions or create a single FTR auction that spans the two markets.

**Rationale For Not Recommending:**

- Addition of cross border products in the auctions is not technically feasible at this time due to the size of the combined model and the complexity of the optimization required.

## Price Rationalization & Convergence at the Border

		Short-Term	Mid-Term
<b>Deliverable</b>		<b>PJM Implementation of Marginal Losses</b>	<b>Alternative Border Pricing Point Calculation</b>
<b>Description</b>		The fact that MISO includes the impact of marginal losses in its dispatch and LMPs while PJM does not, can only increase the level of price separation at the RTO borders. PJM implementation of marginal losses will eliminate this component of price discrepancy.	Participants have suggested that multiple pricing points for transactions between PJM and MISO would provide greater ability to trade between the two RTOs by allowing participants to submit transactions based on physical flow effects on localized transactions.
<b>Value Proposition</b>		PJM implementation of marginal losses will achieve a greater level of price convergence and rationalization at the RTO border.	Participants feel additional price point options would provide greater flexibility and opportunity to trade between PJM and MISO than only one proxy for each RTO.
<b>Cost</b>	<b>Implementation</b>	\$600K (All PJM Costs)	\$200K
	<b>Ongoing</b>	\$0	\$0
<b>Obstacles</b>		PJM stakeholders have yet to approve marginal loss implementation.	PJM and MISO need to be careful that gaming opportunities are not created by implementation of this concept. Verification that the physical MW associated with a particular transaction are actually sourcing/sinking in the physical location represented by more specific pricing points would be extremely difficult, if not impossible. One alternative would be to weight the individual nodes that are combined to constitute the single interface pricing point currently used by each RTO. Such a more sophisticated, real time weighting of the proxy bus components would provide a better indication of the impact of transmission constraints on trade between the two RTOs, and achieve the greatest level of price transparency possible with regard to trade between the two markets.
<b>Action Plan (to address obstacles)</b>		A stakeholder go/no-go vote on the subject is scheduled for October. Following that vote, assuming it is in the affirmative, the most significant issue to be resolved is the allocation of the over-	<ol style="list-style-type: none"> <li>1. Determine a joint approach (best practices)</li> <li>2. Obtain Stakeholder agreement/ support for best practices</li> </ol>

PJM Implementation of Marginal Losses

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Review proposed modifications with stakeholders.												
Make necessary regulatory filings.												
Determine required modifications to PJM policies, procedures, applications and systems.												
Modify policies, procedures , application and systems as needed and test changes.												
Provide training & implement changes.												

Key Milestones:

- ◆ (1) Review Proposed modifications with stakeholders.
- ◆ (2) Regulatory approval
- ◆ (3) Verify required modifications
- ◆ (4) Modifications complete.
- ◆ (5) Implementation complete

Critical Dependencies:

- ▲ PJM Stakeholder approval to implement marginal losses.
- ▲ Regulatory approval to include losses.

Allow participants to submit transactions based on physical flow effects on localized transactions.

Start :2007	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan												
Develop alternative border pricing options and decide which options to study further.												
Perform a detailed study modeling the impact of alternative border pricing methodologies and assess each option to ensure that opportunities for gaming are not introduced. Estimate the cost and schedule to implement viable options.												
Review results with stakeholders and create a detailed implementation plan.												

**Key Milestones:**

- ◆ (1) Alternative pricing options developed
- ◆ (2) Modeling & Analysis Complete
- ◆ (3) Go/No-go stakeholder decision

**Critical Dependencies: none identified.**

		Short-term	Mid-term
<b>Deliverable</b>		<b>Alignment of Operating Reserves/RSG Products</b>	<b>Depancake Pt-to-Pt Ancillary Services</b>
<b>Description</b>		Allocate Operating Reserves and Revenue Sufficiency Guarantee charges similarly to reduce the hourly volatility of these charges in the MISO market.	Eliminate black start, reactive, control area, FERC and TO services pancaked charges for through and out point-to-point transactions between MISO and PJM.
<b>Value Proposition</b>		<ul style="list-style-type: none"> <li>Reduce the hurdle rate associated with MISO-PJM cross-border Transactions</li> <li>RTO Price convergence</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the hurdle rate associated with MISO-PJM cross-border transactions.</li> <li>RTO Price convergence</li> </ul>
<b>Cost</b>	<b>Implementation</b>	\$600K (Note: All MISO cost)	\$400K
	<b>Ongoing</b>		Minimal
<b>Obstacles</b>		Quantification of benefits of reduced hurdle rates and correlation to RTO border prices	<ol style="list-style-type: none"> <li>TOs must absorb 1A costs or re-file.</li> <li>Complex stakeholder process.</li> <li>Quantification of benefits of reduced hurdle rates and correlation to RTO border prices.</li> </ol>
<b>Action Plan (to address)</b>		<ol style="list-style-type: none"> <li>MISO to propose allocation changes to stakeholders</li> <li>If approve, will implement changes in settlements</li> </ol>	<ol style="list-style-type: none"> <li>Further investigation required</li> <li>Number of transactions may be an</li> </ol>

Allocate Operating Reserves (OR) and Revenue Sufficiency Guarantee (RSG) charges similarly to reduce the hourly volatility of these charges in the MISO market.

### *Assumptions*

- ✓ Capture 6% of est. market efficiency gain
- ✓ Number of Participants = 80

<b>Cost Recovery</b>	<b>( \$200,000 )</b>	<b>( \$200,000 )</b>	<b>( \$200,000 )</b>	<b>( \$600,000 )</b>
<b>On-going operating costs</b>	<b>( \$0 )</b>	<b>( \$0 )</b>	<b>( \$0 )</b>	<b>( \$0 )</b>
<b>Market Efficiency Benefit</b>	<b>\$1,254,811</b>	<b>\$1,254,811</b>	<b>\$1,254,811</b>	<b>\$3,764,432</b>
<b>Participant Staffing and Training Savings</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Net Benefits</b>	<b>\$1,054,811</b>	<b>\$1,054,811</b>	<b>\$1,054,811</b>	<b>\$3,164,432</b>

Start :2006	2006				2007				2008				
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	
Assign team and create detailed project plan	[Task bar spanning Q1 2006]												
Determine required modifications to MISO RSG policies, procedures, applications, and systems.	[Task bar spanning Q1 2006, Milestone 1 at end]												
Review proposed modifications with stakeholders.	[Task bar spanning Q1 2006, Milestone 2 at end]												
Make appropriate regulatory filings.	[Task bar spanning Q2 2006, Milestone 3 at end]												
Modify policies, procedures , application and systems as needed and test changes.	[Task bar spanning Q3 2006, Milestone 4 at end]												
Provide training & implement changes.	[Task bar spanning Q4 2006, Milestone 5 at end]												

**Key Milestones:**

- ◆ (1) Requirements Defined
- ◆ (2) Stakeholder go/no-go decision.
- ◆ (3) Regulatory approval
- ◆ (4) Modifications complete
- ◆ (5) Implementation complete

**Critical Dependencies:**

- ▲ Agreement from stakeholders to implement aligned policy.
- ▲ Regulatory approval

**Initiative Description** :Eliminate pancaked rates for scheduling and other ancillary services (e.g. black start, reactive, control area, FERC and TO services) for through-and-out point-to-point transactions between Midwest ISO and PJM

**Further evaluation required:**

- This is an equity issue and may arbitrarily shift costs from one set of market participants to another.
- TOs must absorb Schedule 1 type cost or re-file.
- Generators may lose Schedule 2 revenue or re-file.
- Do not want to create a situation that requires “SECA” type charge.



Start :2005	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Stakeholder Process	[Bar from Q1 2006 to Q4 2006]				1							
Filing Process				[Bar in Q4 2006]								
Identify policies, procedures, application and systems which must be modified and determine costs to implement.					[Bar from Q1 2007 to Q3 2007]			2				
Implementation							[Bar from Q3 2007 to Q4 2007]		3			

**Key Milestones:**

- ◆ (1) Joint agreement of implementation options.
- ◆ (2) FERC approval
- ◆ (3) Implementation complete

**Critical Dependencies - None**

# Broader Price Transparency and Common Reporting

Deliverable	Short-term			Mid-term	Long-term		
	Common Search Capability	Link Existing eData / PTP sites	Joint Website Development	Standard Data Exchange	Standard Data Visualization, Reporting	Joint and Common Website	
Description	Implement one search engine that searches both the PJM and MISO public websites.	Link the existing PJM eData and MISO PTP sites together. Exchange a subset of data between the two sites (e.g. LMP, Instantaneous Load, Tie Flows) and make it available for display and download.	Create one new joint website that hosts PJM and MISO common information (e.g. joint meeting and event calendars).	Develop standard architecture (e.g. Broker engine) and data exchange mechanisms (e.g. Web Services (APIs)) that exchange data between PJM and MISO and make available the data to stakeholders.	Implementation of a single, redundant, data and report portal and supporting architecture that has backup capability shared between PJM and MISO; transparent participant joint access; and personalization capability.	Migrate PJM and MISO websites to one joint and common website. Individual websites for each RTO go away.	
Value Proposition	<ul style="list-style-type: none"> <li>Reduce stakeholder time spent searching two sites</li> <li>More coordination and collaboration between the two entities</li> </ul>	<ul style="list-style-type: none"> <li>Reduce stakeholder time spent logging into and analyzing both sites to get common information</li> <li>Potential reduction in stakeholders' costs (less development time required to interface with one system instead of two)</li> <li>More coordination and collaboration between the two entities</li> </ul>	<ul style="list-style-type: none"> <li>Less overlapping meetings between the two entities / better coordination which may enable more participation</li> <li>Reduced stakeholder time spent searching for meetings / events on individual websites and coordinating calendars / activities themselves</li> </ul>	<ul style="list-style-type: none"> <li>Reduced stakeholders' costs to design, develop, test, and implement to one standard versus two</li> <li>Quicker rollout of new functionality for stakeholders due to reduced time to implement</li> <li>Potential savings in HW and SW licenses required by stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Reduced stakeholders' costs to design, develop, test, and implement to one standard versus two</li> <li>Quicker rollout of new functionality for stakeholders</li> <li>Potential savings in HW and SW licenses required by stakeholders and RTOs</li> <li>Reduced time spent training stakeholders on new systems, reports, information</li> </ul>	<ul style="list-style-type: none"> <li>Less overlapping meetings between the two entities / better coordination which may enable more participation</li> <li>Reduced stakeholder time spent searching for meetings / events on individual websites and coordinating calendars / activities themselves</li> <li>Potential savings in HW and SW licenses and development costs by stakeholders to access two different ..</li> </ul>	
Cost	Implement	\$200K	\$500K	\$600K	\$3M	\$8.5M	\$750K
	Ongoing (annual)	\$50K	\$100K	\$100K	\$200K	\$500K	\$200K
Obstacles	Difference in terminology and business rules between the two entities will not be addressed, but could impact search results.	<ul style="list-style-type: none"> <li>Synchronization of data delivery timeframes</li> <li>Differences in the way data is calculated and used (business</li> </ul>	<ul style="list-style-type: none"> <li>Developing the process to maintain the website, keep it current, and determine what to post.</li> <li>Determining the best way to jointly, technically, support</li> </ul>	<ul style="list-style-type: none"> <li>Synchronization of data delivery timeframes</li> <li>Differences in the way data is calculated and used</li> </ul>	<ul style="list-style-type: none"> <li>Synchronization of data delivery timeframes</li> <li>Alignment of business reporting and data retention practices</li> <li>Differences in the way data is calculated and used (business</li> </ul>	Difference in terminology and business rules between the two entities.	
address obstacles	consistency in business rules, practices, and terminology through the other JCM initiatives.	develop ways to work around or at least communicate these differences to the stakeholder.	that addresses how to maintain and support the site between the two entities.	and develop ways to work around the differences.	develop ways to work around the differences.	in business rules, practices, and terminology through the other JCM initiatives.	

Implement one search engine that searches both the PJM and MISO public websites.

*Assumptions*

- ✓ Time savings of 10 minutes/day
- ✓ 150 Participants

Cost/Benefit	2006	2007	2008	Total
Cost Recovery	( \$66,667 )	( \$66,667 )	( \$66,667 )	( \$200,000 )
On-going operating costs	( \$50,000 )	( \$50,000 )	( \$50,000 )	( \$150,000 )
Market Efficiency Benefit	\$0	\$0	\$0	\$0
Participant Staffing and Training Savings	\$375,000	\$375,000	\$375,000	\$1,125,000
<b>Net Benefits</b>	<b>\$258,333</b>	<b>\$258,333</b>	<b>\$258,333</b>	<b>\$775,000</b>

Implementation of a Common Search Engine

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan												
Identify terminology which can be easily aligned and develop common terminology where possible.												
Evaluate alternative search engines and select the best option.												
Modify policies, procedures , applications and systems to accommodate new terminology and test changes.												
Install new search engine & test												
Provide training & implement changes.												

Key Milestones:

- ◆ (1) Implement aligned terminology
- ◆ (2) Implementation complete

Critical Dependencies: None identified.

Link the existing PJM eData and MISO PTP sites together. Exchange a subset of data between the two sites (e.g. LMP, Instantaneous Load, Tie Flows) and make it available for display and download.

### Assumptions

- ✓ Capture .5% of est. market efficiency gain
- ✓ 10 hours/year in reduced training time
- ✓ Time savings of 25 minutes/day
- ✓ 80 Participants

Cost/Benefit	2006	2007	2008	Total
Cost Recovery	( \$166,667 )	( \$166,667 )	( \$166,667 )	( \$500,000 )
On-going operating costs	( \$100,000 )	( \$100,000 )	( \$100,000 )	( \$300,000 )
Market Efficiency Benefit	\$104,568	\$104,568	\$104,568	\$313,703
Participant Staffing and Training Savings	\$546,154	\$546,154	\$546,154	\$1,638,462
<b>Net Benefits</b>	<b>\$384,055</b>	<b>\$384,055</b>	<b>\$384,055</b>	<b>\$1,152,164</b>



Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan												
Identify the subset of data that will be made available for display and download.												
Evaluate alternative options for linking the site, and for downloading and displaying the in-scope data. Select the appropriate technology and estimate cost and schedule to implement.												
Review cost and schedule with stakeholders.												
Link sites and deploy and test download and display technology.												
Provide training & implement changes.												

**Key Milestones:**

- ◆ (1) Stakeholder approval to proceed
- ◆ (2) linkage made and capability tested.
- ◆ (3) Implementation complete

**Critical Dependencies: None identified.**

Develop a standard architecture and mechanism for exchanging data between MISO and PJM and make it available to participants. This would apply to new exchanges of data and not to existing connections.

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan												
Identify potential new data exchange requirements and verify with Participants.												
Perform detailed cost/ benefit analysis of required modifications to allocation processes and develop implementation plan.												
Review results with stakeholders.												

**Key Milestones:**

- ◆ (1) Data requirements identified
- ◆ (2) Cost/benefit Analysis Complete
- ◆ (3) Go/No-go decision

**Critical Dependencies: none identified.**

## Joint Website Development

Create one new joint website that hosts PJM and MISO common information (e.g. joint meeting and event calendars).

### *Assumptions*

- ✓ Time savings of 10 minutes/day
- ✓ 80 Participants

Cost/Benefit	2006	2007	2008	Total
Cost Recovery	( \$200,000 )	( \$200,000 )	( \$200,000 )	( \$600,000 )
On-going operating costs	( \$100,000 )	( \$100,000 )	( \$100,000 )	( \$300,000 )
Market Efficiency Benefit	\$0	\$0	\$0	\$0
Participant Staffing and Training Savings	\$375,000	\$375,000	\$375,000	\$1,125,000
<b>Net Benefits</b>	<b>\$75,000</b>	<b>\$75,000</b>	<b>\$75,000</b>	<b>\$225,000</b>

Joint Website Development

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan.												
Develop a process to determine what information must be maintained, when information should be change/added or deleted and who should maintain.												
Design and build website, populate with initial information.												
Perform Systems test.												
Provide training & implement changes.												

Key Milestones:

- ◆ (1) Agreement on content.
- ◆ (2) Design Approved
- ◆ (3) Testing Complete
- ◆ (4) Implementation complete

Critical Dependencies: none identified.

**Initiative Description** : Develop and implement a single joint MISO/PJM website and eliminate the existing PJM and MISO websites.

**Rationale For Not Recommending:.**

- A joint website has already be created and is being used for joint activities.
- The existing websites provide sufficient information and are being aligned through a number of the other JCM initiatives. Further stakeholder investment in a single comprehensive website is not necessary.

## Standard Data, Visualization &amp; Reporting

Implementation of a single, redundant, data and report portal and supporting architecture with back-up capability shared between PJM and MISO.

## Assumptions:

- ✓ Capture 1.0 % of est. market efficiency gain
- ✓ 60 hours/year in reduced training time
- ✓ Additional Time savings of 45 minutes/day
- ✓ 80 Participants

Cost/Benefit	2006	2007	2008	Total
Cost Recovery	( \$2,833,333 )	( \$2,833,333 )	( \$2,833,333 )	( \$8,500,000 )
On-going operating costs	( \$500,000 )	( \$500,000 )	( \$500,000 )	( \$1,500,000 )
Market Efficiency Benefit	\$209,135	\$209,135	\$209,135	\$627,405
Participant Staffing & Training Savings	\$1,176,923	\$1,176,923	\$1,176,923	\$3,530,769
<b>Net Benefits</b>	<b>(\$1,947,275)</b>	<b>(\$1,947,275)</b>	<b>(\$1,947,275)</b>	<b>(\$5,841,825)</b>

**Initiative Description** : Implementation of a single, redundant, data and report portal and supporting architecture with back-up capability shared between PJM and MISO.

**Rationale For Not Recommending:**

- Cost/benefit Analysis does not produce the justification to consider.

# Increased Market Opportunities

		Short-Term	Long-Term
<i>Deliverable</i>		<b>Moving Joint-Owned Units (JOUs) Between Markets</b>	<b>Shared Regulation Market</b>
<i>Description</i>		PJM and MISO market participants jointly own generating assets and, as a result, pseudo-tie portions of the output of those units into the PJM and MISO markets. These participants have indicated a desire to be able to choose which market into which they sell their share of the output of these JOUs in both Day-Ahead and Real-Time.	In general, the larger the area over which a market is operated, the more efficient the market becomes. That is, the more resources available to be selected in the market, the lower the resulting price of the product becomes.
<i>Value Proposition</i>		The ability for participants to choose into which markets the output of their units is sold and take advantage of any price differentials that may exist at these units' buses will benefit both the participants and the markets as a whole. The benefit to the participants would be their ability to receive greater revenue from their assets. Since differentials between the prices the RTOs calculate at identical buses indicates the relative value of the energy to each RTO at that location, the benefit to the markets would be for the owners of these assets to the RTO to which the energy at that location is more valuable. Should the prices at the RTO borders converge, this value to the participants and the markets may be minimal.	A larger market operated over both RTO footprints would result in more efficient procurement of the Regulation service by the RTOs.
<i>Cost</i>	<i>Implementation</i>	\$100K	\$8M
	<i>Ongoing</i>		\$500k / yr
<i>Obstacles</i>		PJM, MISO and the owners of these assets have resolved the majority of the issues associated with changing the pseudo-tie values in real time. There may be further issues that need to be resolved to provide the ultimate flexibility eventually requested by the participants.	Implementation of a shared Regulation market between PJM and MISO would require the real time, 2-second exchange of energy between the two markets. Since generators in MISO could be providing Regulation to PJM or vice versa, when the output of the regulating units is raised or lowered in response to ACE deviations in either market, the energy must actually be transferred to that market in order to impact the appropriate control error. This evaluation can not be made until the control area consolidation issue in MISO is resolved.
<i>Action Plan (to address obstacles)</i>		<ol style="list-style-type: none"> <li>1. Determine a joint approach (best practices)</li> <li>2. Obtain Stakeholder agreement/ support for best practices</li> </ol>	<ol style="list-style-type: none"> <li>1. Determine a joint approach (best practices)</li> <li>2. Obtain Stakeholder agreement/ support for best practices</li> </ol>

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan.	■											
Develop alternative processes for further accommodating the movement of JOUs between markets and jointly select the best option.	◆ 1											
Identify policies, procedures, applications and systems which must be to modified to accommodate the new process & determine cost to implement.	■	◆ 2										
Modify policies, procedures, application and systems as required and test.			■	◆ 3								
Provide training & implement changes.				■	◆ 4							

**Key Milestones:**

- ◆ (1) Process Designed
- ◆ (2) Modifications Identified
- ◆ (3) Testing Complete
- ◆ (4) Implementation complete

**Critical Dependencies: None identified.**

Start :2007	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan												
Develop and analyze options for implementing a combined regulation market and determine if implementation is feasible.												
Perform detailed study modeling the impact of shared regulation on market efficiency and reliability to benefits of implementation.												
Identify policies, procedures, application and systems which must be modified and determine costs to implement.												
Review results with stakeholders and make Go/No-go decision.												

**Key Milestones:**

- ◆ (1) Joint agreement of feasibility of implementation.
- ◆ (2) Completion of detailed cost and benefit analysis.
- ◆ (3) Go/No-decision

**Critical Dependencies:**

- ▲ Control Area consolidation and reserve market issues in MISO must be resolved prior to implementing.

# Operational Consistency

		Short-term	Mid-term	Long-term
<b>Deliverable</b>		<b>MISO Ramp Viewer Completed</b>	<b>Central location to view both ramp viewers</b>	<b>Common Ramp Portal</b>
<b>Description</b>		Market Participants have the ability to view ramp in MISO	Develop a central location where both ramp viewers can be seen.	Develop a common portal to allow market participants to view and reserve ramp in both RTO's simultaneously.
<b>Value Proposition</b>		Market Participants have the ability to view ramp in both PJM and MISO separately	<ul style="list-style-type: none"> <li>• Avoids the need to bounce from website to website to view both RTO ramps.</li> <li>• Cost effective solution.</li> </ul>	<ul style="list-style-type: none"> <li>• Avoids the need to access both market systems to reserve ramp.</li> <li>• Creates a single point of entry for reserving ramp in both systems.</li> </ul>
<b>Cost</b>	<b>Implementation</b>	Current MISO project	\$100K	\$750K
	<b>Ongoing</b>		\$10K / Year	\$50K / Year
<b>Obstacles</b>		None	There may be security issues with posting dynamic information to a common site.	<ul style="list-style-type: none"> <li>• Implementation costs may be higher than forecast.</li> <li>• Security may be a concern with transferring information from a central spot.</li> </ul>
<b>Action Plan</b> <i>(to address obstacles)</i>			Meet with security teams to develop strategy.	<ul style="list-style-type: none"> <li>• For a moderately expensive tool, acquiring ramp reservations may not be in the best interest. This is a stakeholder decision.</li> <li>• Meet with security teams to develop strategy.</li> </ul>

Start :2005 (project underway)	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan.	To be Complete in 2005											
Define Ramp Viewer business and technical requirements.	To be Complete in 2005											
Architect and design viewer and select appropriate technology to implement.	To be Complete in 2005											
Build and test viewer.	◆ 1											
Provide training & implement changes.	◆ 2											

**Key Milestones:**

- ◆ (1) Testing Complete
- ◆ (2) Implementation complete

**Critical Dependencies: None identified**

Develop a central location where both MISO and PJM ramp viewers can be accessed.

*Assumptions*

- ✓ Capture 1% of est. market efficiency gain
- ✓ Time savings of 15 minutes/day
- ✓ 80 Participants

<b>Cost Recovery</b>	<b>( \$33,333 )</b>	<b>( \$33,333 )</b>	<b>( \$33,333 )</b>	<b>( \$100,000 )</b>
<b>On-going operating costs</b>	<b>( \$10,000 )</b>	<b>( \$10,000 )</b>	<b>( \$10,000 )</b>	<b>( \$30,000 )</b>
<b>Market Efficiency Benefit</b>	<b>\$209,135</b>	<b>\$209,135</b>	<b>\$209,135</b>	<b>\$627,405</b>
<b>Participant Staffing &amp; Training Savings</b>	<b>\$300,000</b>	<b>\$300,000</b>	<b>\$300,000</b>	<b>\$900,000</b>
<b>Net Benefits</b>	<b>\$465,802</b>	<b>\$465,802</b>	<b>\$465,802</b>	<b>\$1,397,405</b>

Central Location to View Both Ramp Viewers

Start :2007	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan.					■							
Develop business and technical requirements for central location including a review of security concerns.					■	◆ 1						
Design central location and select appropriate technology to implement.					■							
Build and test central location.						■	◆ 2					
Provide training & implement changes.							■	◆ 3				

**Key Milestones:**

- ◆ (1) Security Concerns Addressed
- ◆ (2) Testing Complete
- ◆ (3) Implementation complete

**Critical Dependencies: None identified**

Develop a common portal to allow market participants to view and reserve ramp in both RTOs simultaneously.

### Assumptions

- ✓ Capture 1.5% of est. market efficiency gain
- ✓ Time savings of 25 minutes/day
- ✓ 80 Participants

Cost/Benefit	2008	2009	2010	Total
Cost Recovery	( \$250,000 )	( \$250,000 )	( \$250,000 )	( \$750,000 )
On-going operating costs	( \$50,000 )	( \$50,000 )	( \$50,000 )	( \$150,000 )
Market Efficiency Benefit (1.5%)	\$313,703	\$313,703	\$313,703	\$941,108
Participant Staffing & Training Savings	\$500,000	\$500,000	\$500,000	\$1,150,000
<b>Net Benefits</b>	<b>\$513,703</b>	<b>\$513,703</b>	<b>\$513,703</b>	<b>\$1,541,108</b>

Start :2008	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan.												
Develop joint business and technical requirements for a common ramp portal.												
Architect and design portal and select appropriate technology to implement.												
Build and test portal.												
Provide training & implement changes.												

**Key Milestones:**

- ◆ (1) Joint Requirements Complete
- ◆ (2) Testing Complete
- ◆ (3) Implementation Complete

**Critical Dependencies: None identified**

## Operational Consistency (cont.)



		Short-term			
<i>Deliverable</i>		Common Long Term Transmission Queue	Alignment of OASIS Business Practices	Coordinated OASIS	Single OASIS
<i>Description</i>		Creation of a MISO and PJM common long-term transmission service queue. The service queue impacts only annual, cross-border, firm transmission service requests.	Requests for transmission service on each node have different timing requirements. This project would align those times.	Link the two OASIS nodes, so there is a single logon (to two individual nodes)	A customer facing front-end that masks the existence of the individual OASIS systems.
<i>Value Proposition</i>		Eliminates uncertainty. Currently, timing requirements combined with independent study by each RTO sometimes results in customers being awarded service in only one of the two RTOs. This may result in a cost for "useless" transmission service while preventing other customers from obtaining service.	One set of timing requirements (training).	Efficiency. Participants do not need to learn to use both nodes. Requests can be submitted once.	<ol style="list-style-type: none"> <li>1 Eliminate partial path problems</li> <li>2 Converge business practices</li> <li>3 Reduced customer costs (train for 1 system and rules, one service request)</li> <li>4 Integration with Common Portal</li> </ol>
<i>Cost</i>	<i>Implementation</i>	\$200K	\$500k	\$1.2 M	\$8M
	<i>Ongoing</i>	\$400 per study + benefits that vary by customer	No added ongoing costs	\$300k / year	\$500k / yr
<i>Obstacles</i>		Agreement changes	Tariff changes	<ol style="list-style-type: none"> <li>1. Limitations of the S&amp;CP (standard) templates limits the functionality of this approach.</li> <li>2. Requests are not linked for evaluation.</li> </ol>	<ol style="list-style-type: none"> <li>1. Business practice</li> <li>2. Service agreements with</li> <li>3. Legacy systems</li> <li>4. Agreement changes</li> <li>5. Implementation costs</li> </ol>
<i>Action Plan</i>		Filings and committee process	Filings and committee process		



Create a common long term transmission queue that facilitates easier scheduling of annual, cross-border firm transmission service requests.

### Assumptions

- ✓ Capture 1.5% of est. market efficiency gain
- ✓ Time savings of 10 minutes/day
- ✓ 20 Participants

Cost/Benefit	2006	2007	2008	Total
Cost Recovery	( \$66,667 )	( \$66,667 )	( \$66,667 )	( \$200,000 )
On-going operating costs	( \$0 )	( \$0 )	( \$0 )	( \$0 )
Market Efficiency Benefit	\$313,703	\$313,703	\$313,703	\$941,108
Participant Staffing & Training Savings	\$50,000	\$50,000	\$50,000	\$150,000
<b>Net Benefits</b>	<b>\$297,036</b>	<b>\$297,036</b>	<b>\$297,036</b>	<b>\$891,108</b>

Common Long term Transmission Queue

Start :2006	2006				2007				2008				
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	
Assign team and create detailed project plan.	[Bar from start of 2006 to start of Q1 2006]												
Determine differences in existing PJM and MISO processes and define a common long term transmission queue process.	[Bar from start of Q1 2006 to start of Q2 2006]												
Identify policies, procedures, applications and systems which must be to modified to accommodate the new process & determine cost to implement.	[Bar from start of Q2 2006 to start of Q3 2006]												
Review process and cost with stakeholders and make go/no-go decision.	[Bar from start of Q3 2006 to start of Q4 2006]												
Make necessary regulatory filings	[Bar from start of Q4 2006 to start of Q1 2007]												
Modify policies, procedures, application and systems as required and test.	[Bar from start of Q1 2007 to start of Q2 2007]												
Provide training & implement changes.	[Bar from start of Q2 2007 to start of Q3 2007]												

**Key Milestones:**

- ◆ (1) Agreement on Process
- ◆ (2) Stakeholder Approval
- ◆ (3) Regulatory Approval
- ◆ (4) Testing Complete
- ◆ (5) Implementation Complete

**Critical Dependencies:**

- ▲ MISO Stakeholder agreement on FTR best practices.
- ▲ Regulatory approval.

Align timing requirements associated with transmission service requests.

<i>Assumptions</i>	Cost/Benefit	2006	2007	2008	Total
✓ Capture 1.0% of est. market efficiency gain	Cost Recovery	( \$166,667 )	( \$166,667 )	( \$166,667 )	( \$500,000 )
✓ Training savings of 10 hours/year	On-going operating costs	( \$0 )	( \$0 )	( \$0 )	( \$0 )
✓ Time savings of 10 minutes/day	Market Efficiency Benefit	\$209,135	\$209,135	\$209,135	\$627,405
✓ 80 Participants	Participant Staffing & Training Savings	\$246,154	\$246,154	\$246,154	\$738,462
	<b>Net Benefits</b>	<b>\$288,622</b>	<b>\$288,622</b>	<b>\$288,622</b>	<b>\$865,867</b>

Alignment of OASIS Business Practices

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan.												
Identify policies, procedures, and terminology which comprise the MISO and PJM OASIS business practices.												
To the extent possible, develop common terminology and align policies, procedures and business practice documentation.												
Identify applications and systems which must be modified to effect the alignment.												
Modify applications and systems as required and test.												
Provide training & implement changes.												

Key Milestones:

- ◆ (1) Common terminology and business practices.
- ◆ (2) Testing Complete
- ◆ (3) Implementation Complete

Critical Dependencies: None identified

Link the PJM and MISO OASIS nodes such that there is a single logon (to both nodes simultaneously), allowing a single request to be submitted. The request will not be linked for evaluation.

### Assumptions

- ✓ Capture 4.0% of est. market efficiency gain
- ✓ Training savings of 10 hours/year
- ✓ Time savings of 20 minutes/day
- ✓ 80 Participants

Cost/Benefit	2006	2007	2008	Total
Cost Recovery	( \$400,000 )	( \$400,000 )	( \$400,000 )	( \$1,200,000 )
On-going operating costs	( \$300,000 )	( \$300,000 )	( \$300,000 )	( \$900,000 )
Market Efficiency Benefit	\$836,540	\$836,540	\$836,540	\$2,509,621
Participant Staffing & Training Savings	\$446,154	\$446,154	\$446,154	\$738,462
<b>Net Benefits</b>	<b>\$582,694</b>	<b>\$582,694</b>	<b>\$582,694</b>	<b>\$1,748,083</b>

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan												
Develop and analyze options for implementing a coordinated OASIS and determine if implementation is feasible.												
Identify policies, procedures, application and systems which must be modified and determine costs to implement.												
Review results with stakeholders and make Go/No-go decision.												

**Key Milestones:**

**Critical Dependencies: None identified.**

- ◆ (1) Determination of feasibility
- ◆ (2) Cost analysis complete
- ◆ (3) Stakeholder decision

A customer facing front end that masks the existence of the individual PJM/MISO OASIS systems.

### Assumptions:

- ✓ Capture 7% of est. market efficiency gain
- ✓ 20 hours/year in reduced training time
- ✓ Additional Time savings of 25 minutes/day
- ✓ 80 Participants

Cost/Benefit	2006	2007	2008	Total
Cost Recovery	( \$2,666,667 )	( \$2,666,667 )	( \$2,666,667 )	( \$8,000,000 )
On-going operating costs	( \$500,000 )	( \$500,000 )	( \$500,000 )	( \$1,500,000 )
Market Efficiency Benefit	\$1,463,936	\$1,463,936	\$1,463,936	\$4,391,837
Participant Staffing & Training Savings	\$592,308	\$592,308	\$592,308	\$1,776,923
<b>Net Benefits</b>	<b>(\$1,110,413)</b>	<b>(\$1,110,413)</b>	<b>(\$1,110,413)</b>	<b>(\$3,331,240)</b>

**Initiative Description :** Implement a customer facing front end that masks the existing individual OASIS systems.

**Rationale For Not Recommending:**

- Cost/benefit Analysis does not produce the justification to consider.

## Operational Consistency (cont.)



		Short-term	Mid-Term	
<i>Deliverable</i>		Common Treatment of Dynamic Schedules/Pseudo-ties	Common Time Zones (Modify PJM systems to EST)	Reserve Sharing
<i>Description</i>		In general, participants desire the flexibility to allow their generating units to participate directly in the RTO of their primary interest, even if those units are not physically located in that RTO. Providing this flexibility means implementing dynamic	MISO's systems are currently on EST. PJM currently operates on EPT. The recommendation would be to move PJM's system to EST to align with the MISO system.	As Large Regional Reliability Organizations (LRROs) such as the ReliabilityFirst Corporation (RFC) are created, the potential for reserve sharing agreements that cross RTO borders will continue to exist. Consistent treatment and administration of these agreements by PJM and MISO will better enable their development, thereby allowing market participants an additional mechanism by which to control their costs.
<i>Value Proposition</i>		Consistent treatment of dynamic schedules/pseudo-ties will provide participants with the certainty of knowing the impact to their assets of taking advantage of this flexibility. PJM and MISO staffs can work on potential resolutions to the differences that	<ul style="list-style-type: none"> <li>• Ongoing IT costs would be reduced due to simplification of system requirements between PJM and MISO (both RTO and Participants)</li> <li>• Reduced confusion when scheduling and interacting in</li> <li>• Potentially elimination of costly mistakes by participants if they misinterpret or incorrectly convert time from one RTO to the other.</li> <li>• Increased efficiency between Mkt and Sys Operators.</li> </ul>	Additional mechanisms enabling market participants to control and minimize their cost of maintaining system reliability.
<i>Cost</i>	<i>Implementation</i>	\$200K	\$5M Due to the newly passed energy bill PJM is already performing an impact assessment of moving the DST dates. Moving the DST dates has the potential to be on the order 50-100% more costly than switching to EST.	\$8M
	<i>Ongoing</i>		No ongoing costs for this initiative. There would actually be a cost savings when developing new systems due to less dependencies around DST switch and less support necessary on DST days	\$500k / yr
<i>Obstacles</i>		The RTO goal will not be to foster new dynamic schedules, but instead to 1) handle pseudo ties and dynamic schedules in a common way; and 2) provide market incentives which make the pseudo ties and dynamic schedules undesirable.	<ol style="list-style-type: none"> <li>1. Gaining PJM stakeholder support and commitment to make necessary changes to their IT systems to only send/receive data in EST with PJM.</li> <li>2. PJM participants on EPT would be impacted.</li> <li>3. Wall clock versus system time for operators</li> </ol>	The interface of these mechanisms with existing and developing market mechanisms for the Synchronized Reserve ancillary service will need to be determined. For example, while large markets for these services are desirable in order to maximize their efficacy
<i>Action Plan (to address obstacles)</i>		<ol style="list-style-type: none"> <li>1. Validate RTO differences and develop common approach</li> <li>2. Obtain Stakeholder agreement/ support for best practices</li> <li>3. Implement at RTO</li> </ol>	<ol style="list-style-type: none"> <li>1. Obtain stakeholder buy-in through committee process along with road show to convince stakeholders</li> <li>2. Advanced/ongoing communication of changes</li> <li>3. Training or make wall clock same as system at PJM.</li> </ol>	<ol style="list-style-type: none"> <li>1. Determine a joint approach (best practices)</li> <li>2. Obtain Stakeholder agreement/ support for best practices</li> </ol>

**In general, participants desire the flexibility to allow their generating units to participate directly in the RTO of their primary interest, even if those units are not physically located in that RTO. Providing this flexibility means implementing dynamic schedules the same way in each RTO**

### *Assumptions*

- ✓ Capture .50% of max market efficiency gain
- ✓ Reduced Training Time by 5 hours/year
- ✓ Number of Participants = 80

Cost/Benefit	2007	2008	2009	Total
Cost Recovery	(\$66,667)	(\$66,667)	(\$66,667)	(\$200,000)
On-going operating costs	( \$ 0 )	( \$ 0 )	( \$ 0 )	( \$ 0 )
Market Efficiency Benefit	\$104,568	\$104,568	\$104,568	\$313,703
Participant Staffing & Training Savings	\$23,077	\$23,077	\$23,077	\$69,231
<b>Net Benefits</b>	<b>\$60,978</b>	<b>\$60,978</b>	<b>\$60,978</b>	<b>\$182,933</b>

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
MISO implement change to remove dynamic schedule from ramp.												
Assign team and create detailed project plan												
Identify PJM and MISO procedures, applications and systems which are related to dynamic schedules												
Determine the effort required by stakeholders to modify their systems to accommodate a change.												
Review results with stakeholders and implement.												

**Key Milestones:**

- ◆ (1) Analysis complete
- ◆ (2) Stakeholder decision.

**Critical Dependencies: None Identified.**

MISO's systems are currently on Eastern Standard Time (EST). PJM's systems are currently on Eastern Prevailing Time (EPT). PJM systems would be modified to operate on EST.

### Assumptions

- ✓ Capture 1.0% of max market efficiency gain
- ✓ 15 hours/year in reduced training
- ✓ 4 Minutes/day in reduced staff time
- ✓ 80 Participants
- ✓ The elimination of errors due to confusion over time differences was identified as a benefit, but, no value has been assigned.

Cost/Benefit	2007	2008	2009	Total
Cost Recovery	( \$1,666,667 )	( \$1,666,667 )	( \$1,666,667 )	( \$5,000,000 )
On-going operating costs	( \$0 )	( \$0 )	( \$0 )	( \$0 )
Market Efficiency Benefit	\$209,135	\$209,135	\$209,135	\$627,405
Participant Staffing & Training Savings	\$149,231	\$149,231	\$149,231	\$447,692
<b>Net Benefits</b>	<b>(\$1,308,301)</b>	<b>(\$1,308,301)</b>	<b>(\$1,308,301)</b>	<b>(\$3,924,902)</b>

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan												
Identify PJM policies, procedures, applications and systems which must be modified to accommodate a time change.												
Determine the effort and cost required to conform to the timing requirements in the federal energy legislation and the incremental effort required to change to EST.												
Determine the effort required by stakeholders to modify their systems to accommodate a change.												
Review results with stakeholders and make Go/No-go decision.												

**Key Milestones:**

- ◆ (1) Analysis complete
- ◆ (2) Stakeholder decision.

**Critical Dependencies: None Identified.**

**Initiative Description :** As Large Regional Reliability Organizations (LRROs) such as the ReliabilityFirst Corporation (RFC) are created, the potential for reserve sharing agreements that cross RTO borders will continue to exist. Consistent treatment and administration of these agreements by PJM and MISO will better enable their development, thereby allowing market participants an additional mechanism by which to control their costs

**Rationale For Not Recommending:**

- ▶ There is uncertainty as to how the Large Regional Reliability Organizations will implement reserve sharing agreements;
- ▶ While some reserve sharing arrangements exist currently, PJM and MISO do not have the authority under our Tariffs to globally implement reserve sharing agreements on behalf of the members.

		Long-Term
<i>Deliverable</i>		<b>Single Resource Adequacy Solution</b>
<i>Description</i>		PJM has proposed the Reliability Pricing Model as its future resource adequacy construct. MISO stakeholders are still discussing potential implementation of a resource adequacy construct for the MISO footprint. Differences between the adopted resource adequacy constructs of the two RTOs could have implications in other areas, such as operations during scarcity conditions, reserve sharing, etc.
<i>Value Proposition</i>		A resource adequacy approach would lead to greater possible coordination in other areas, as mentioned above.
<i>Cost</i>	<i>Implementation</i>	\$8M
	<i>Ongoing</i>	\$500K
<i>Obstacles</i>		Resource adequacy is still an issue in both PJM and MISO, and resolution in the individual RTOs is still some ways off, making adoption of a common construct a very long-term objective.
<i>Action Plan (to address obstacles)</i>		To be determined

**Initiative Description :** Develop a single resource adequacy solution for use in both MISO and PJM.

**Rationale For Not Recommended:**

- Resource adequacy issues continue to be unresolved within both MISO and PJM. Agreement between PJM and MISO on a common or single resource adequacy solution can not be considered until the individual organizations have resolved their internal issues.

## Single Market

	Short-term	Mid-term	Long-term	
Deliverable	<b>Year 1 - Rule Alignment &amp; Market Portal Design</b>	<b>Year 2 - Initial Market Portal Implementation</b>	<b>Year 3-5 - Implementation of Single Market</b>	
Overview	To the greatest extent possible, provide a single data entry point and results distribution capability for MISO and PJM market and ancillary services application systems to virtually emulate a "one-stop-shopping" paradigm for: 1) Day-Ahead Market 2) Real-Time Market 3) Ancillary Services Market (Single Control Area; Single Unit Commitment; Joint Clearing for Day-Ahead; Single Real-Time; Single Network Transmission Service; Common Backup Facility; Single FTR Allocation; Single FTR Auction)			
Description	Business Rule Assessment 1) Define Business Processes to be implemented 2) Identify Process Differences 3) Create Coordinated Business Process Flows 4) Obtain Stakeholder/Regulatory Approvals  Business Process Feasibility Assessment 1) Define Conceptual Functional Requirements 2) Define Conceptual Technical Specifications 3) Evaluate Technical Feasibility of Functional Requirements 3) Obtain Stakeholder/Regulatory Approvals  Coordination Engine: 1) Create Functional Requirements 2) Define Standard Security Services 3) Define Standard Error, Messaging, and Event handling Services 4) Create Functional Architecture Specifications	Business Process Functional Specifications: 1) Define Functional Business Rules to be Implemented 2) Create Functional Business Process Flows 3) Create Functional Business Examples 4) Obtain Stakeholder/Regulatory Approvals  Business Process Technical Specifications: 1) Create Detailed Technical Specifications of Business Rules to be Implemented 2) Create Detailed Technical Business Process Flows 3) Create Detailed Technical Business Examples 4) Obtain Stakeholder/Regulatory Approvals  Coordination Engine: 1) Create Detailed Technical Architecture Specifications 2) Create Detailed Technical Specifications	Business Process Implementation 1) Construct, Test & Implement Single Market Detailed Technical Specifications  Coordination Engine: 1) Procure Hardware & Software 2) Construct, Implement, and Test Final System Components	
Value Proposition	<ul style="list-style-type: none"> <li>. Better Coordination</li> <li>. Common Practices</li> <li>. Identical Rules</li> <li>. Single Market</li> </ul> Note: There is no current defensible business case to justify expense			
Cost	Implement	\$15M	\$40M	\$50M
	Ongoing (annual)	\$7M		
Obstacles	Potential Hurdles 1) Differences in Business Rules. 2) Differences in Market Timings (opening and  min LMP; etc). 4) Technical Feasibility of operating combined footprint			
Action Plan	To be determined			

**Initiative Description :** To the extent possible provide a single data entry point and results distribution capability for MISO and PJM market and ancillary service application systems to emulate “one-stop-shopping” for the Day-Ahead Market, Real-Time Market, and Ancillary Services Markets. The year 1 initiative would entail rule alignment and portal design.

**Rationale For Not Recommended:**

- The cost of implementation is not justified by the incremental benefits that a single market would create. (To be verified with production cost study).

**Initiative Description** : To the extent possible provide a single data entry point and results distribution capability for MISO and PJM market and ancillary service application systems to emulate “one-stop-shopping” for the Day-Ahead Market, Real-Time Market, and Ancillary Services Markets. The year 2 initiative would entail implementation of a common market portal.

**Rationale For Not Recommending:**

- The cost of implementation is not justified by the incremental benefits that a single market would create. (To be verified with production cost study)

**Initiative Description :** To the extent possible provide a single data entry point and results distribution capability for MISO and PJM market and ancillary service application systems to emulate “one-stop-shopping” for the Day-Ahead Market, Real-Time Market, and Ancillary Services Markets. The year 3 through 5 initiatives would focus on the construction, testing and implementation of applications and systems associated with the management of a single market.

**Rationale For Not Recommending:**

- The cost of implementation is not justified by the incremental benefits that a single market would create. (To be verified with production cost study).



# Reliability Initiatives

# Emergency Energy – Black Start & Restoration



		Short-term	Mid-Term
<i>Deliverable</i>		<b>Emergency Energy Agreement</b>	<b>Black Start and Restoration</b>
<i>Description</i>		Former Control Area Operators of PJM and MISO had emergency energy agreements in place to facilitate the sale of energy during emergency conditions. While these agreements existed prior to RTO development, MISO and PJM may not be a legal party to the agreement. MISO and PJM would need to replace these existing agreements with emergency energy agreements between the RTOs.	PJM currently has a cost-based black start procurement process included as Schedule 6A of its Tariff. Midwest ISO is developing a very similar cost-based structure to be added to its Tariff. Future coordination could potentially include joint restoration plans, leading to joint evaluation of critical black start resources.
<i>Value Proposition</i>		Emergency energy agreements between the RTOs would provide additional reliability value if the markets were unable to respond quickly enough during system emergencies.	Future coordination could include joint restoration plans, leading to joint evaluation of critical black start resources. Value may be achieved by some black start units being regionally available for both RTOs.
<i>Cost</i>	<i>Implementation</i>	\$100K Low cost to put the agreements in place (coordination and legal fees).	\$500k Regulatory filings; tariff changes; review of black start plans across both RTOs to identify units; process for qualification and testing
	<i>Ongoing</i>	Implementation (actual emergency energy sale) costs would only occur during reliability emergencies	\$100K Annual testing of qualified units
<i>Obstacles</i>		Legal coordination and corporate structure limitations may be an obstacle to complete the agreements in the short term.	Number of actual many units which reasonably qualify for black start in both regions; tariff and regulatory changes; reliability concerns
<i>Action Plan (to address obstacles)</i>		Establish emergency energy agreements closely aligned with existing (PJM) agreements and former control area to control area agreements	Need to determine the actual number of units which reasonably qualify for black start in both regions; address tariff and regulatory changes and reliability concerns



Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan.												
Identify existing agreements which need to be replaced with emergency energy agreements between the RTOs.												
Determine the legal, regulatory and corporate structure issues associated with replacing the prior agreements with new RTO to RTO agreements and analyze the cost to resolve.												
Obtain necessary Stakeholder approvals to move forward with new agreements.												
Make appropriate regulatory filings.												
Draft, sign and implement new agreements.												

**Key Milestones:**

- ◆ (1) Analysis Complete
- ◆ (2) Stakeholder Approval
- ◆ (3) Regulatory approval
- ◆ (4) Agreements in place.

**Critical Dependencies:**

- ▲ Stakeholder approval.
- ▲ Regulatory approval.

Coordinate system restoration plans and jointly evaluate critical black start resources.

*Assumptions*

- ✓ Black Start requirements reduced by 150 MWs
- ✓ Black Start Charges in PJM are \$2112/Mw-year

Cost/Benefit	2007	2008	2009	Total
Cost Recovery	( \$166,667 )	( \$166,667 )	( \$166,667 )	( \$500,000 )
On-going operating costs	( \$100,000 )	( \$100,000 )	( \$100,000 )	( \$300,000 )
Reduced Black Start Unit Costs	\$312,000	\$312,000	\$312,000	\$936,000
<b>Net Benefits</b>	<b>\$45,333</b>	<b>\$45,333</b>	<b>\$45,333</b>	<b>\$136,000</b>

*Note: Intangible benefit of increased system reliability adds to overall Net Benefits*



Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Assign team and create detailed project plan.												
Compare MISO & PJM process, review terminology, process elements and product pricing, and determine the modifications required to align the processes.												
Determine the tariff, regulatory, and reliability issues associated with closer alignment of the processes and analyze the cost to proceed.												
Obtain stakeholder Approval to proceed.												
Make appropriate regulatory filings.												
Modify policies, procedures, applications and system to accommodate the new process.												
Provide training and implement.												

**Key Milestones:**

- ◆ (1) Analysis Complete
- ◆ (2) Stakeholder approval
- ◆ (3) Regulatory approval
- ◆ (4) Implementation complete

**Critical Dependencies:**

- ▲ Stakeholder approval.
- ▲ Regulatory approval.



# Planning Initiatives

# Joint Expansion Planning & Common Deliverability Studies

<i>Deliverable</i>		<b>Joint expansion planning Common deliverability studies</b>
<i>Description</i>		<ul style="list-style-type: none"> <li>• Joint expansion planning – regional expansion plans will include coordinated planning to include evaluation of impacts on other RTO facilities and required facility upgrades.</li> <li>• Common deliverability studies – generation deliverability studies will include common criteria and study to obtain results which demonstrate if units are deliverable in both RTOs.</li> </ul>
<i>Value Proposition</i>		<ul style="list-style-type: none"> <li>• Joint expansion planning - Eliminates uncertainty. Planning for facilities upgrades and regional planning done on a coordinated basis between RTOs for reliability.</li> <li>• Common Deliverability studies – generation deliverability studies based on a single criteria / single study with study results detailing deliverability in both RTOs.</li> </ul>
<i>Cost</i>	<i>Implementation</i>	<p style="text-align: center;">\$20K Joint expansion planning \$100K Common Deliverability studies</p>
	<i>Ongoing</i>	<ul style="list-style-type: none"> <li>• Joint expansion planning - \$50k annual – queue and study coordination / RTO</li> <li>• Common Deliverability studies – \$25k annual - study coordination / RTO</li> </ul>
<i>Obstacles</i>		<ul style="list-style-type: none"> <li>• Joint expansion planning – study criteria and coordination</li> <li>• Common Deliverability studies – Regulatory filings, tariff changes, study criteria and coordination</li> </ul>
<i>Action Plan (to address obstacles)</i>		<ul style="list-style-type: none"> <li>• Joint expansion planning – Initial stakeholder meeting – October 2005</li> <li>• Common Deliverability studies – Detailed definition, regulatory filings</li> </ul>

Regional expansion plans will include coordinated planning to include evaluation of impacts on other RTO facilities and required facility upgrades. Generation deliverability studies will include common criteria and study to obtain results which demonstrate if units are deliverable in both RTOs and if they are not deliverable in both RTOs what system constraints limit the deliverability.

Assumptions

- ✓ The primary benefit of joint expansion planning will be increased reliability. There is a potential for market efficiency benefits but they can not be quantified until the first joint expansion plan is complete. There are expected to be minimal participant staffing and training savings

Cost/Benefit	2006	2007	2008	Total
<b>Cost Recovery</b>	( \$120,000 )	( \$0 )	( \$0 )	( \$120,000 )
<b>On-going operating costs</b>	( \$150,000 )	( \$150,000 )	( \$150,000 )	( \$450,000 )
<b>Market Efficiency Benefit</b>	N/A	N/A	N/A	N/A
<b>Participant Staffing and Training Savings</b>	N/A	N/A	N/A	N/A
<b>Net Benefits</b>	<b>Increased Reliability</b>	<b>Increased Reliability</b>	<b>Increased Reliability</b>	<b>Increased Reliability</b>

# Joint Planning & Common Deliverability

Start :2006	2006				2007				2008			
Activity	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Create detailed project plan and discuss with stakeholders – end of 2005.												
Complete study to determine any reliability problems including limiting facilities for common deliverability – 1 <sup>st</sup> and 2 <sup>nd</sup> quarter 2006												
Provide results to stakeholders – early 3 <sup>rd</sup> qtr 2006												
Obtain stakeholder Approval to proceed.												
Modify policies, procedures, applications and system to accommodate the new process.												
Provide training and implement.												

**Key Milestones:**

- ◆ (1) Analysis Complete.
- ◆ (2) Approval to Proceed.
- ◆ (3) Process in place.

**Critical Dependencies: None identified.**