



**PJM-MISO
JOINT AND COMMON MARKET WHITE PAPER
JULY 2005**

VERSION 1

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I. Executive Summary

The Midwest Independent Transmission System Operator, Inc. (MISO) and PJM Interconnection (PJM) intend to move toward effective implementation of a robust, non-discriminatory Joint and Common electricity Market (JCM) covering their collective regions. The goal is to achieve all the benefits of a combined market across the footprint that includes both PJM and MISO and that meets the needs of all customers and stakeholders using the electric power grid in the two RTO's regions. These benefits will be gained by examining the different rules by which the two RTOs operate as individual entities and evolving – over time - to coordinate market operations and ensure there are no impediments to trade in either, both, or between the markets. Modifications to the existing operations, tools and processes will be developed through an open stakeholder process and will be designed to benefit participants regardless of which RTO they belong to, or if they are in both.

Well-functioning, efficient, and competitive markets benefit customers because they:

- Provide information about the value of energy to buyers and sellers active in the markets who, through their market actions, produce competitive prices.
- Create incentives for efficient production.
- Allocate scarce resources efficiently.
- Create incentives for efficient investment where and when needed by highlighting scarcity through price signals.
- Provide customers with new options and flexibility for meeting demand.
- Have many buyers and sellers participating.
- Have no artificial barriers to entry.
- Exhibit little market power and/or manipulation.

The purpose of this document is to define, at a high level, the philosophy that the RTOs' will employ as they strive to identify:

- Those benefits that can easily be achieved with little or no capital investment;
- Those requiring an level intermediate investment and slightly more detailed analysis relative to the benefits achieved; and
- Those functions that require a substantial investment to evaluate the relative merit of performing due to the complexity of integrating the functionality into a Joint and Common Market (JCM functions that fundamentally alter the business practices of MISO and/or PJM to the point of significantly changing the way participants conduct business with them, thereby causing obsolescence of participant sunk software costs).

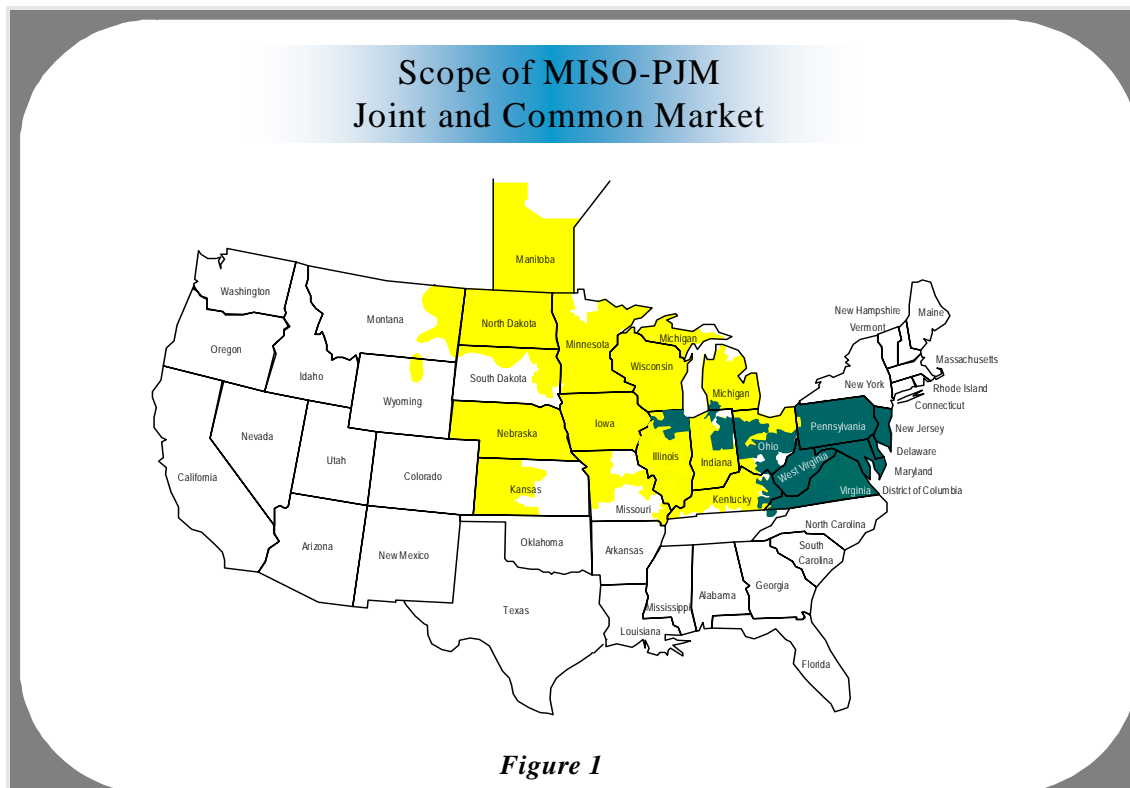
II. Joint and Common Market

A. INTRODUCTION

Of critical importance to the overall success of the Joint and Common Market (JCM) implementation effort being undertaken between MISO and PJM, is the ability for the market participants to seamlessly and efficiently conduct business in the two markets. What components of the two existing RTO's functionality should be incorporated into the JCM and the timing of their incorporation will be the major focus of the open collaborative stakeholder process. The overall cost-benefit analysis for the items ultimately included on the JCM road map will be performed jointly by MISO and PJM, leveraging financial benefits and commercial opportunities that are supplied from the actual business experiences of the participants.

Critical steps in the development of the JCM Road Map and associated cost-benefit analysis include:

- Creation of a collaborative stakeholder process to define the JCM business objectives and desired functional alignment that needs to occur between MISO and PJM.
- Determination of costs associated with implementation of the candidate JCM functionality.
- Determination of benefits derived from implementation of candidate JCM functionality.
- Selection of JCM functionality to be implemented from the cost-benefit analysis.
- Development of the JCM implementation road map and timeline.



B. INTERREGIONAL COORDINATION

It is widely accepted that there are significant technical and economic benefits to interregional coordination and trade. The objectives for Joint and Common Market development could include:

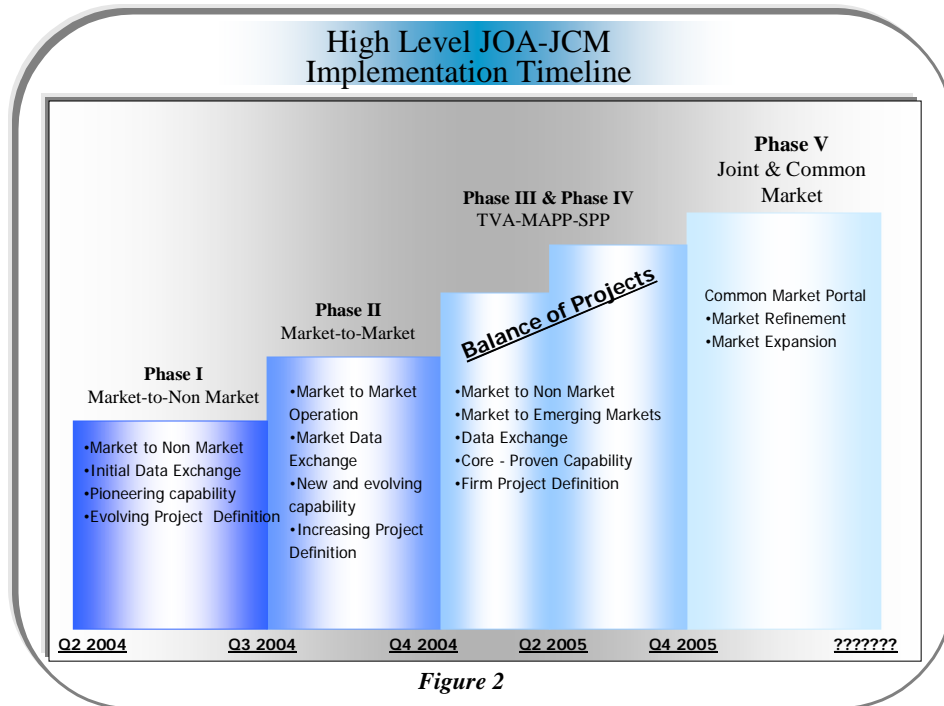
- Delivery of the lowest cost energy to load across the combined RTO footprint;
- Cross-border price rationalization;
- Improved flow of information to market participants and the public.

To accomplish these goals MISO and PJM will work together with the market participants to achieve the following objectives:

- Refine procedures for confirming transactions and schedules among the RTOs that maximizes markets' efficiencies while protecting bulk power system reliability and security.
- Improve protocols for coordinating real-time operations and planning activities among the RTOs.
- Investigate feasibility and cost-benefit of increasing inter-tie capacity.
- Enhance technical processes to strengthen coordination between each RTO's planning procedures.
- Identify rules and practices that may need to be addressed to promote seamless markets at the inter-ties.
- Identify and coordinate regional redispatch opportunities.
- Identify and provide consistent information required to support the marketplace in each RTO.

C. JCM EVOLUTION – JOINT OPERATING AGREEMENT

MISO and PJM have been working to anticipate and prevent seams issues from arising through the creation of a Joint Operating Agreement, and will leverage existing teams and capabilities to the fullest while implementing the JCM.



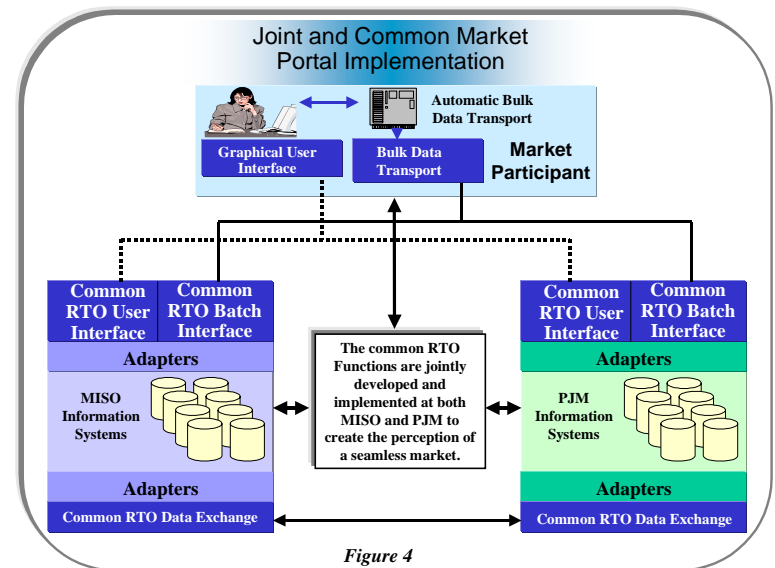
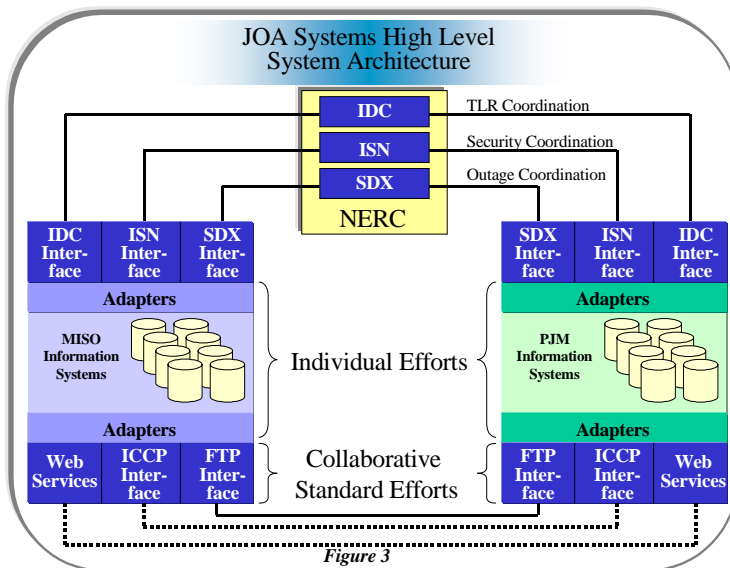
MISO and PJM have established processes and systems to share congestion management related data pursuant to enhancing reliability in the MISO, PJM, and the neighboring transmission regions. Pursuant to the FERC's order on Alliance Companies, MISO and PJM entered into a Joint operating agreement (JOA) on December 30, 2003. This JOA requires allocating reciprocal flowgate capabilities between the reciprocal entity, and these allocations are called NNL (Network and Native Load) limits. The obligation extends to monitoring and controlling these flowgates in a coordinated manner observing the AFC and the NNL limits. Thus, the JOA satisfies or exceeds the criteria established by the Commission and governs the reliability aspects of the impacted region. The JOA resolves seams issues, providing for exchanging of SCADA data, management of loop flows, flowgates, generation dispatch, planned outages, states of emergency, long-term transmission planning, and other relevant areas.

JOA capabilities for Market to Non-Market between MISO and PJM were implemented in May 2004. The implementation of the MISO and PJM JOA Market to Market capabilities was completed in April of 2005. During the JOA implementation a significant amount of effort went into the creation and establishment of cross-functional MISO/PJM business and information technology teams. It is MISO and PJM's intent to leverage these existing capabilities, as well as the JOA technologies already put in place, in the development and implementation of the JCM.

D. JOA OBJECTIVES

There are a number of objectives that the MISO-PJM JOA implementation team has strived to achieve during the course of the project that directly applies to the JCM effort. The key findings include:

- **RTO priorities must be aligned.** Both PJM and MISO and their stakeholders need to be committed to the effort in order for it to succeed and the stakeholders need to be involved and committed as well.
- **The benefit needs to justify the expense.** On the JOA initiative to date, PJM and MISO have spent a combined total of over \$20 Million on the two-year effort. This project was neither as ambitious nor near the magnitude of the JCM initiative.
- **Alignment of RTO commercial practices must be evaluated.** Projects relative to the development of the Joint and Common Market will be implemented only if cost-beneficial, and must be approved by each RTO's set of stakeholders.



E. COST AND BENEFIT CONSIDERATIONS

Both MISO and PJM have spent considerable time and effort developing their commercial practices and implementing the software systems to operate both reliability and market functions. This investment in people, process, and technology has spanned many years and cost hundreds of millions of dollars. A good portion of these expenses resulted from the need to develop energy market business rules and process definitions to address regional issues; a key goal the JCM is required to achieve being a resynchronization of the two markets rule sets (i.e. - a resolution of regional differences that create improved market efficiencies). These existing business rules have been codified into both the PJM and MISO information systems and integrated with participant, reliability, market monitoring, and regulatory information systems.

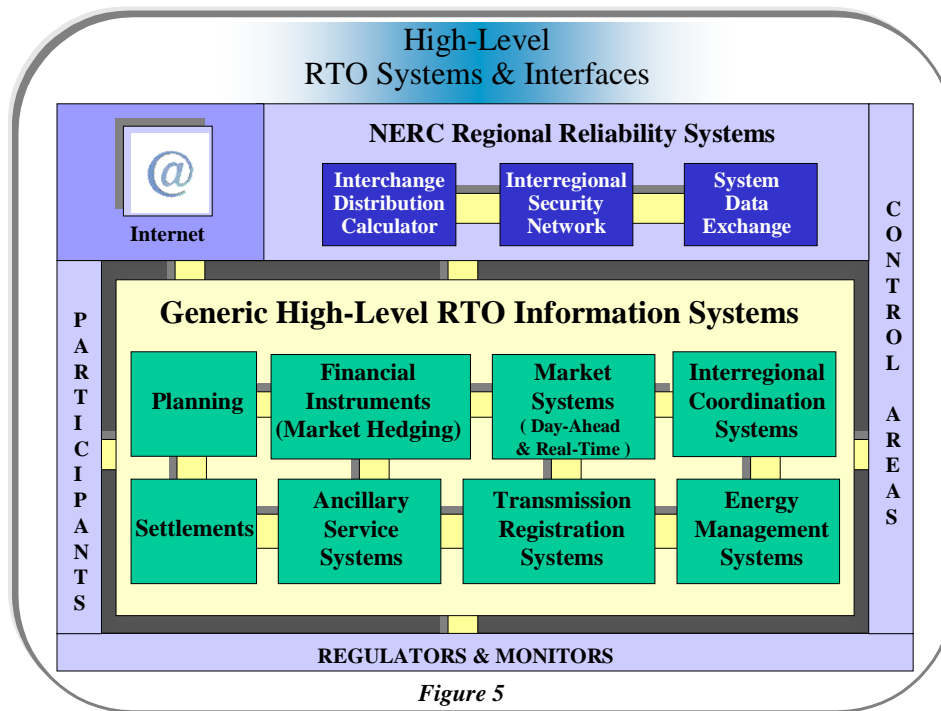


Figure 5

These are highly complex, and extremely interdependent, application systems. It will take considerable time and effort to modify these systems once the JCM functional requirements are fully defined, especially if the changes to existing commercial business practices are drastic in nature.

There are a wide range of solutions options for resolving commercial business practice differences between MISO and PJM. The following is a framework that starts from what functionality would likely be the least costly to implement, through that which would intuitively be the most costly to implement:

1) *Minimal Investment:*

- **Alignment of the PJM and MISO FTR allocation/auction timeframes:** Much of this effort will be completed beginning as of June 1, 2006 when the MISO annual FTR timeframe will fall in line with the June 1 – May 31 planning year. However, further alignment may be possible with regard to the seasonal nature of the MISO FTR allocation if such alignment would be beneficial to stakeholders.
- **File Tariff changes to eliminate point-to-point transmission service ancillary service pancaking:** Although any proposals to eliminate point-to-point transmission service ancillary service charges in one RTO or the other would need to be vetted through the individual RTO stakeholder groups, filing the actual changes themselves could be done at very little cost to the RTOs.
- **Create a long-term transmission service queue:** This effort could potentially be accomplished primarily through the alignment of analysis methodologies on the part of PJM and MISO, and may be able to be implemented at relatively low cost.

2) *Intermediate Investment:*

- **Creation of broader market price transparency:** This category could include the exchange of information between MISO and PJM that would enable the market participants to view information about market operations as if it were one entity. Report consolidation, joint postings of consolidated prices, and simultaneous event notifications are examples of items included in this category.

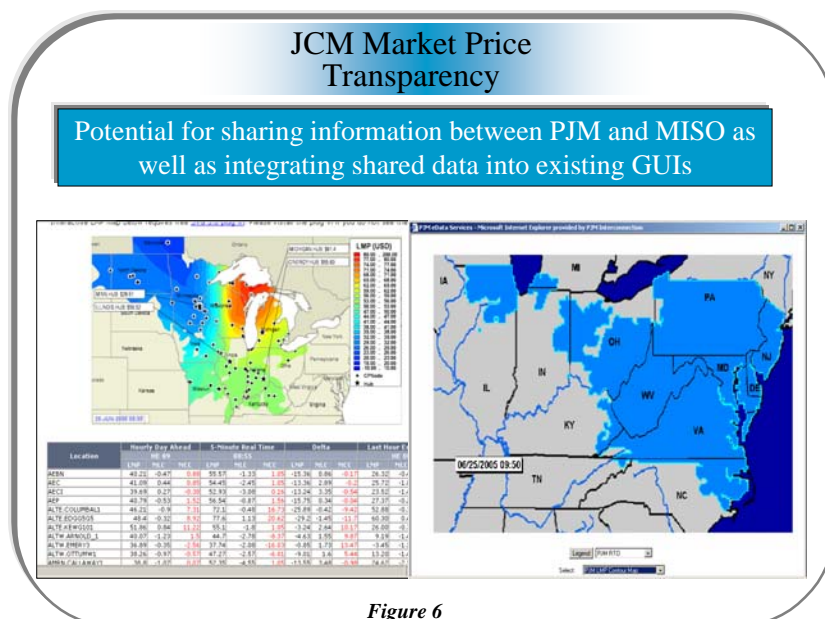


Figure 6

- **Creation of more efficient service offerings:** Included in this category are items like creation of a common oasis site, implementation of cross border FTRs, and common/joint implementation of ancillary service offerings. These can be costly items that a full cost-benefit analysis would need to be performed on.

3) Substantial Investment:

- **Achievement of end state JCM objectives:** Should the initial steps taken in the Joint and Common Market development prove insufficient to achieve the identified objectives, then more comprehensive initiatives such as a single unit commitment, a joint real time dispatch, etc. will need to be considered. Such initiatives could require assimilation of various business rules and processes on the part of both PJM and MISO and fundamentally alter the mechanisms by which participants conduct business with the RTOs.

For those items requiring a full cost analysis, the types of costs to be included in the analysis of JCM candidate functionality will include, but not be limited to (MISO, PJM, & participants in total):

- 1) **Conceptual design costs** - functional business requirement definition and scope documentation.
- 2) **Detailed design costs** - functional business requirements to technical implementation specifications.
- 3) **Construction costs** - costs to modify/build systems inclusive of hardware, network and software licensing costs.
- 4) **Testing costs** - costs to perform system integration/staging internal and external testing.
- 5) **User Costs** – costs the individual participants will incur in order to alter their mechanisms of interaction with the RTOs.
- 6) **Three-year maintenance costs** - ongoing costs to support systems inclusive of any requirement for additional staffing.
- 7) **Training costs** - costs to train staff and participants on modified/new systems usage and utilization.

It should be noted that it is not just the costs of modifications to MISO and PJM's systems that will need to be identified. The time and effort to modify and test the participant's interfaces with the systems will also be factored into the overall cost analysis for each JCM functionality candidate.

For those items requiring a full benefit analysis, the types of benefits to be utilized in the analysis of JCM candidate functionality will include, but not be limited to (MISO, PJM, & participants in total):

Tangible Benefits:

- 1) **Decreased production costs** – reduced overall production costs across the combined footprint as a result of the increased ability to do business between the markets.
- 2) **Decreased staffing costs** – elimination of efforts associated with performing a task.
- 3) **Decreased computing maintenance costs** – elimination of hardware, software, and networking devices/connectivity (benefit evaluation to be determined on a case-by-case basis).
- 4) **Decreased facility costs** – elimination of office space, equipment, and/or facility (benefit evaluation to be determined on a case-by-case basis).

Intangible Benefits:

- 1) **Risk Avoidance** – elimination of risks associated with poor performance of market functionality or uncertainty associated with market information (benefit evaluation to be determined on a case-by-case basis).
- 2) **Consistency** – provide consistent results for market participants' activities across MISO and PJM.
- 3) **Opportunity** – enhanced ability to interact with the markets and increase shareholder value, or improve bottom line of participant organizations (benefit evaluation to be determined on a case-by-case basis).

Once the cost-benefit analysis has been performed, MISO and PJM will jointly develop (provided stakeholder input on desired priorities) the JCM road map and implementation timeline, given their collective abilities and resource availability to perform the required tasks, as well as their participant's ability to support and fund the efforts.

III. Strategy

In order to achieve the goal of creation of the JCM, the strategic approach includes a number of tactical initiatives. These include:

Stakeholder involvement

Critical to the success of this effort is the active involvement of PJM and MISO stakeholders throughout the process. In order to ensure active involvement by stakeholders, a JCM Executive Steering Committee will be created. This committee will meet monthly (or more frequently, if required) to oversee the selection process and implementation of the participant's desired JCM functionality.

Additionally, the participants and stakeholders will be asked to create task forces within the JCM initiative to discuss topics in more detail in order to bring forth to the Executive Steering Committee points of discussion and conclusions/recommendations for communication and support.

Regulatory buy in

Regulatory changes and approval will play a major part in the implementation of the JCM. As a result, coordination and communication with Federal and State regulators will be required. Input will be solicited and concerns addressed/identified through the Midwest ISO and PJM LLC Regulatory and Governmental Affairs staff members.

Incremental Implementation Approach

An incremental implementation approach provides smaller increments of business functionality over time versus one, large implementation. The incremental approach allows for the management of risk, by not placing all the functionality and change in one large release. It also provides business functionality more quickly to stakeholders, thus providing value sooner. Finally, an incremental approach also allows for greater flexibility by responding to changes in the business environment as they are occurring and reflecting those changes in the incremental release.

Leveraging of technology

Technology will play a key role in the success of the creation of the JCM. A number of vendor product offerings exist in the market and have been employed at various RTO organizations. The leveraging of off the shelf solutions to minimize development time, whenever and wherever possible, will be a key tactical strategy going forward.