Transmission Resource Optimization - TRO

Executive Summary
September 2006
What is TRO?

A Transmission wide focus to drive productivity and effectiveness in all functions. TRO established organizational framework, management philosophy, and focus to drive improvements.

TRO is the system by which Transmission manages productivity improvement which enlists the following elements:

- Goals
- Governance
- Evaluation
- Priorities
- Performance Metrics and Measures
- Structure
- Policies and Processes

The following summary presentation will provide background on the TRO effort as well as insight into some of the key features of the TRO model.
Transmission leadership team established TRO long range goals in 2005. Short range goals and tactics were set in early 2006.

# 2006 TRO Goals

## Long Range Goals
- Integrated Planning Process
- Seamless Execution
- Financial Integrity and Credibility
- Sustainable Reliability Management

## Short Range Priorities
<table>
<thead>
<tr>
<th>Priority</th>
<th>2006/2007 Tactics</th>
</tr>
</thead>
<tbody>
<tr>
<td>End to End Process Improvement</td>
<td><strong>Institutionalized processes</strong> Implement standardized, sustainable, documented, efficient work processes for each of the identified Tier 1 Teams, driving greater project implementation capacity</td>
</tr>
<tr>
<td>Cost &amp; Budget Management</td>
<td><strong>$17M in 2007 capital savings</strong></td>
</tr>
<tr>
<td>TRO Employee Engagement</td>
<td><strong>Improve TRO Communications to employees</strong></td>
</tr>
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</table>

Get our house in order to take on high volume of transmission capital projects.
TRO Governance

Governance
- TRO Scorecard
- Leadership Accountabilities
- Monthly Team Status Reports
- TRO Review Panel - Provides Governance
- Director Sponsorship of Teams
- Prioritization of Focus
- Conflict Resolution Process

Establish strategic direction and objectives to guide the TRO process and resolve major strategic issues, as required.

- Provide guidance for performance of all TRO Teams.
- Serve as final decision-making body for issues.
- Develop and recommend resolution of jurisdictional and process improvement issues.

- Provide project management support on behalf of the directors.
- Coordinate efforts of TRO Teams and solve inter-team conflicts.
- Identify issues needing attention of the directors and VP if necessary.

Transmission VP

Directors

TRO Review Panel
Dick Blatnik
Greg Chamberlain
Gary Petersen

Approve process solutions, recommend TRO priorities, and approve capital savings initiatives.

TRO Manager

Capital Savings Team
TRO Capital Project Teams
TRO Operations Productivity Teams
Business Evaluation

TRANSMISSION ASSESSMENT PROJECT

Objectives

Purpose
- Develop roadmap for the transmission organization to allow for increased effectiveness in operations of the transmission business

Approach
- Assess current workflow activities
- Evaluate gaps between current state and desired end state
- Recommend improvements designed to facilitate execution of transmission growth strategy

Goals
- Identify transmission strengths and opportunities
- Acknowledge weaknesses and align organization around productivity improvements
- Identify implementable recommendations with short and long term benefits with measurable results
- Identify improvements that produce quantitative and qualitative benefits to improve effectiveness and increase organization's ability to complete more work with current resources

In 2004 / 2005 a detailed assessment of the Transmission business was conducted.
All functions within Transmission were reviewed.

### Project and Portfolio Integration

- **Asset Optimization**
- **System Planning**
- **Design/Engineering**
- **Construction**
- **Commissioning**
- **System Maintenance**
- **Reliability Management**

#### Asset Optimization
- Asset ownership decisions
- Lifecycle analysis
- System utilization and planning studies
- Standards and procedures development
- Technological innovation development
- Benchmarking and data mining
- Risk management

#### System Planning
- Long-term planning/modeling
- Short-term modeling
- Option analysis/growth strategy
- Regional coordination
- Xcel Energy operating company coordination
- Interconnection planning

#### Design/Engineering
- Field evaluations (surveying, structure staking, customer contact)
- Detailed design (design options, cost analysis, system requirements, technical requirements)
- Drafting
- Material and equipment specifications

#### Construction
- Contract management
- ROW development
- Contractor mobilization
- Operator/Contractor liaison development
- Contractor/EPC procedure, QA and procedure review for contractors
- Lockout/safety procedure establishment
- Safety Management
- Contractor demobilization

#### Commissioning
- Commissioning and operator teaming
- Sign-off procedure development
- Adjust lockout/safety procedures as necessary
- Perform Commissioning activities and turn over to operations
- Complete acceptance signoffs and establish applicable punch lists

#### System Maintenance
- Line patrols and equipment inspection
- Maintenance Management
- Switching coordination
- Substation maintenance
- Relay testing
- Vegetation and ROW management

#### Reliability Management
- System operations
- Control center management
- EMS system management
- RTO interface
- Regulatory interface (FERC, NERC)
- Day-ahead/real-time planning
- Training and certifications
- Monitoring and reporting

### Regulatory / Market Relations

- Federal
- State
- County/Local

### Safety and Technical Training

- Safety
- Technical Training

### Ancillary Services

- Customer service
- Contract management
- Billing
- CAD/CAM
- Document Control
**TRO Project Recommendations**

End state visions were developed, gaps identified and improvement recommendations documented.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Issues</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Management</strong></td>
<td></td>
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<tr>
<td>Portfolio Integration</td>
<td>Inconsistent project management and project manager roles across companies, Underutilized data management tools, Limited involvement in long-term planning process</td>
<td>Adopt advanced construction techniques at all levels within organization, Formalize PM position within transmission organization, Ensure construction requirements are fed forward into all other processes within each project</td>
</tr>
<tr>
<td>Asset Optimization</td>
<td>Inconsistent replace vs. repair philosophy, Less developed application / use of standards, Disconnected project prioritization between TAM and DAM</td>
<td>Develop tools to allow for consistent analysis of asset replacement vs. maintenance – Life Cycle costing, Implement common prioritization framework between T&amp;D with BU adjustment, Develop detailed system and component failure analysis program</td>
</tr>
<tr>
<td>System Planning</td>
<td>Budget and planning processes not synchronized / aligned, High-level estimating process inefficiencies and lack of planning standards, Planning backlog creates less long-term / growth focused activities</td>
<td>Modify planning approach to account for timing of mid-year projects, Standardize planning processes to increase time spent on other activities, Establish business development / strategy / project management role</td>
</tr>
<tr>
<td>Design/Engineering</td>
<td>Limited design / engineering involvement in planning process, Limited time to provide estimates to planning due to backlog of planning work</td>
<td>Adopt “constructability” concept at all levels and functions within organization, Adopt “constructability” concept at all levels and functions within organization</td>
</tr>
<tr>
<td>Siting and Land Rights</td>
<td>Unable to close deals with landowners real-time while onsite, Disconnect between planning and siting regarding routing assumptions, Lack of definitive project schedule with roles and accountabilities</td>
<td>Re-define the regulatory strategy to accommodate regional growth requirements, Adopt “constructability” concept at all levels and functions within organization, Formalize project management process and tools (with role mentioned above)</td>
</tr>
<tr>
<td>Procurement</td>
<td>Lack of process standardization impedes ability to procure materials early, Timing of planning and engineering does not facilitate single contract / single order sourcing</td>
<td>Continue development of transmission standards beyond wires, Modify planning process and implement “constructability”</td>
</tr>
<tr>
<td>Construction</td>
<td>Work order structure inhibits grouping of major project types, Limited involvement in planning process, Workload not balanced throughout year due to timing of planning and budgeting</td>
<td>Investigate opportunity to create work order structure for management reporting, Adopt “constructability” concept at all levels and functions within organization, Modify planning approach to account for timing of mid-year projects</td>
</tr>
<tr>
<td>System Maintenance</td>
<td>Inconsistent repair vs. replace philosophies</td>
<td>Develop consistent approach to asset maintenance and replacements</td>
</tr>
<tr>
<td><strong>Project Delivery</strong></td>
<td></td>
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<tr>
<td>Reliability Management</td>
<td>MISO implications to control center operations, Potential to consolidate WI control center after common platform installed</td>
<td>Evaluate control center operations in a post MISO environment, Evaluate options to consolidate Wisconsin control center after EMS installation</td>
</tr>
<tr>
<td>Regulatory / Market Relations</td>
<td>Varied regulatory strategy, approach and aggressiveness based on business objectives, Limited time to gain constituent / regulator buy-in early in process</td>
<td>Increase regulatory involvement and influence in regulatory planning forums, Involvement in project lifecycle will facilitate early notification of potential hurdles</td>
</tr>
<tr>
<td>Other</td>
<td>Lack of information for management decision-making, Workforce planning and knowledge transfer issues given age of workforce</td>
<td>Identify business analysts to capture / report on data and project administration, Develop long-term workforce / resource plan to address workforce retirements</td>
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Priority - Capital Projects

Given the magnitude of capital spend, the Transmission leadership team focused TRO on the capital project recommendations first. Based on the assessment, a performance improvement goal was established to achieve $17M capital project cost improvements based on a 2005, $171M capital project budget. The $17M would be used to “self-fund” additional Transmission projects beginning in 2007.

Transmission 2006 Total Spend  
Capital and O&M

- Capital Budget $224M 80%
- O&M Reliability $45M 16%
- O&M Other $12M 4%

Total 2006 Spend $281M

Transmission 2010 Total Spend  
Capital and O&M

- Capital Budget $421M 86%
- O&M Reliability $52M* 11%
- O&M Fees $14M* 3%

Total 2010 Spend $487M*

* Assumes 3% Annual O&M Growth
Capital Spend forecast to nearly double in next 4 years. This represents Transmission’s greatest opportunity for performance gains and financial risk management.
Phase I TRO teams were launched based on opportunity to influence early stage project cost curve and reduction in implementation risk. Project material and construction labor costs are established early in the project cycle and are the primary project cost components.
### 2006 TRO Process Teams
#### Phase I

<table>
<thead>
<tr>
<th>Team / Effort</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Project Process - Project Delivery Roles and Responsibilities &amp; Beginning to End Capital Project Process</td>
<td>Provide standard definition of roles and responsibilities and process maps across jurisdictions for project delivery. (Project Management Office - PMO). Document beginning to end Transmission project process to be followed across all jurisdictions.</td>
</tr>
<tr>
<td>Project Management Office System (PMOS)</td>
<td>Project Management IT system solution to integrate current IT systems and enable the PMO process.</td>
</tr>
<tr>
<td>Constructability I Scope Phase</td>
<td>Develop a process across all jurisdictions involving all stakeholders in project scope development driving best cost project design, construction and operation.</td>
</tr>
<tr>
<td>Constructability II Design Phase</td>
<td>Develop a process across all jurisdictions involving all stakeholders in project design supporting best cost project construction and operation.</td>
</tr>
<tr>
<td>Supply Chain Coordination</td>
<td>Identify and implement improvements to support a seamless supply chain process enhancing value to constructability.</td>
</tr>
<tr>
<td>Estimating</td>
<td>Identify and implement improvements to improve project estimating accuracy.</td>
</tr>
<tr>
<td>Outage Coordination</td>
<td>Identify and implement improvements for recognizing and obtaining needed transmission outages.</td>
</tr>
</tbody>
</table>
## Structure - TRO Roadmap

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IN PROCESS</strong></td>
<td></td>
<td></td>
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<tr>
<td>Constructability Capital Savings</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Identified for 2007</td>
<td></td>
<td></td>
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<tr>
<td>Phase I TRO Teams</td>
<td></td>
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<tr>
<td>Supply Chain</td>
<td></td>
<td></td>
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<tr>
<td>Estimating</td>
<td></td>
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<tr>
<td>Constructability I</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Constructability II</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Outage Scheduling</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Capital Project Process</td>
<td></td>
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<tr>
<td>Project Management System</td>
<td></td>
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<tr>
<td><strong>(PMOS) Project</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>PLANNED FOR 2007 / 2008</strong></td>
<td></td>
<td></td>
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<tr>
<td>Phase 2 TRO Teams</td>
<td></td>
<td></td>
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<tr>
<td>Transmission Asset Management</td>
<td></td>
<td></td>
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<tr>
<td><strong>(TAMS) Project</strong></td>
<td></td>
<td></td>
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<tr>
<td>Policies and Procedures Project</td>
<td></td>
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<tr>
<td>Design / Engineering /</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Standards</td>
<td></td>
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</tbody>
</table>
# Performance Metrics and Measures - TRO Scorecard

<table>
<thead>
<tr>
<th>Stakeholder Group</th>
<th>Key Performance Indicator</th>
<th>Champion</th>
<th>YTD Actual</th>
<th>YTD Target</th>
<th>Year End Target</th>
<th>Weighting (%)</th>
<th>On/Off Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customers</strong></td>
<td><strong>Improve Operations</strong></td>
<td>Cenedella</td>
<td>6</td>
<td>8</td>
<td>31</td>
<td>15%</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td>Tier 1 TRO Milestones Complete</td>
<td>Cenedella</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Approved Processed Implemented</td>
<td>Blatnik</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>20%</td>
<td>On</td>
</tr>
<tr>
<td><strong>Employees</strong></td>
<td><strong>Improve Credibility with Employees</strong></td>
<td>Cenedella</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>15%</td>
<td>On</td>
</tr>
<tr>
<td></td>
<td>Communication of TRO Progress (#)</td>
<td>Cenedella</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Investors</strong></td>
<td><strong>Cost Management</strong></td>
<td>Johnson</td>
<td>$25</td>
<td>$25</td>
<td>$25</td>
<td>20%</td>
<td>On</td>
</tr>
<tr>
<td></td>
<td>Identify $25 Million Capital Savings</td>
<td>Johnson</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meet 2006 Milestones for Implementation of 2007 Capital $17M Savings</td>
<td>Chamberlain</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>20%</td>
<td>On</td>
</tr>
<tr>
<td></td>
<td>TRO Budget O&amp;M (Work-Hours)</td>
<td>Cenedella</td>
<td>294</td>
<td>900</td>
<td>2400</td>
<td>10%</td>
<td>Off</td>
</tr>
</tbody>
</table>
Results Thus Far

▲ $17 million in 2007 capital project cost savings identified and implemented. Savings used to self-fund additional capital project work.

▲ Program Management Office System (PMOS) business case funding approved 4/06 - $240K.

▲ PMOS full project funding business case presentation scheduled for Business Systems Senior Leadership Team (SLT) 9/21/07 - $3 million in funding requested.

▲ Beginning-to-end capital project process design overhaul complete, moving to implementation.
Observations / Next Steps

▲ TRO productivity model - right approach for capital projects.

▲ Beginning work to apply TRO model to O&M functions.

▲ Working with Distribution Asset Management System (DAMS) to look at O&M approach.
  ▼ Initiating program to create TAMS

▲ TRO leveraging Energy Supply work for capital projects.
  ▼ Project Management Program
  ▼ Policies and Procedures Library

▲ Key next step - creation of Policies and Procedures library to capture process improvements developed by TRO teams.