



Nodal Program Update

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Sr. VP and Chief Technology Officer

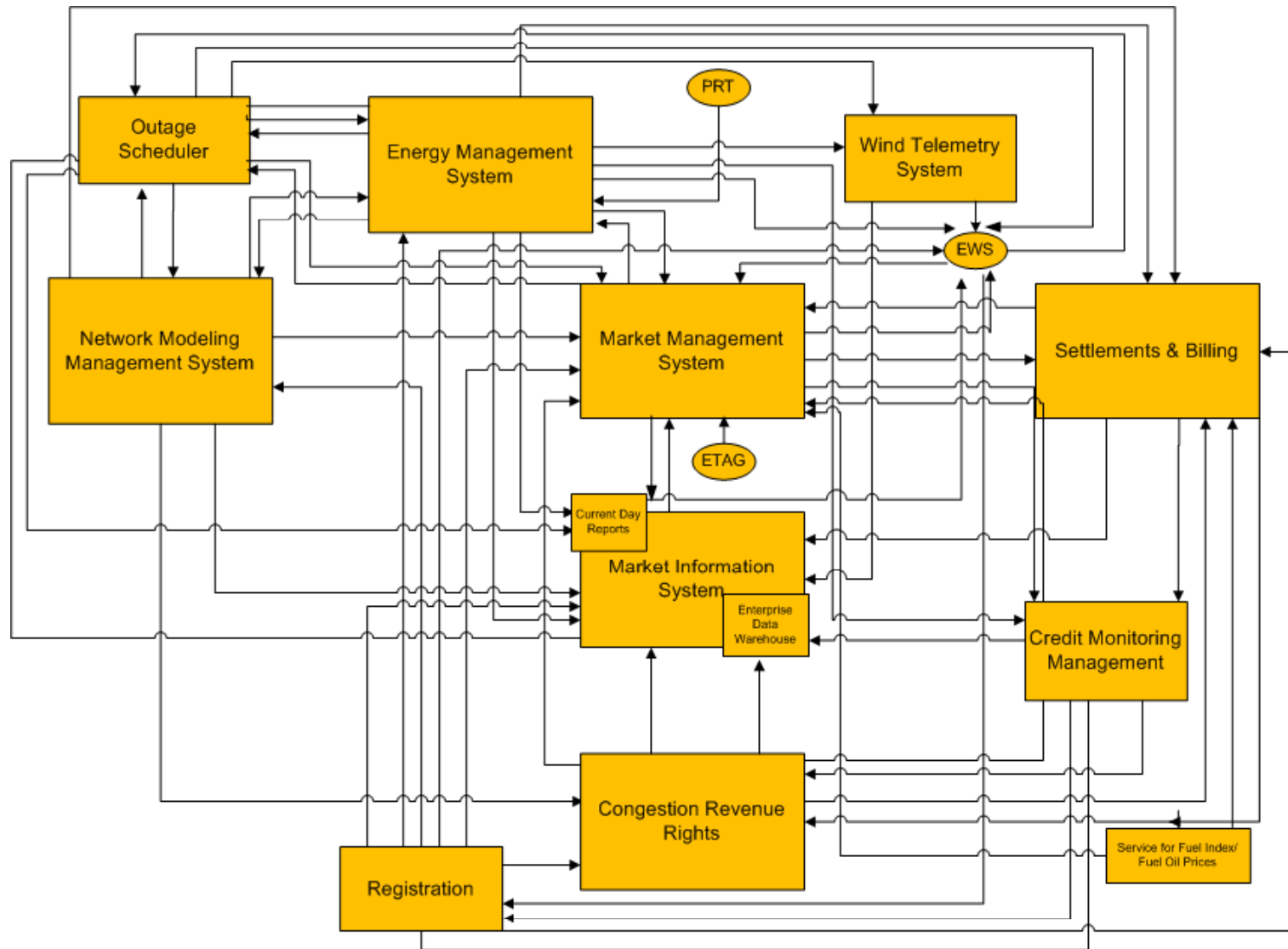
ERCOT Board of Directors

15 September 2009

Agenda

- **Program Status**
- **Market Readiness**
- **Traceability**
- **Financials**
- **Appendix**

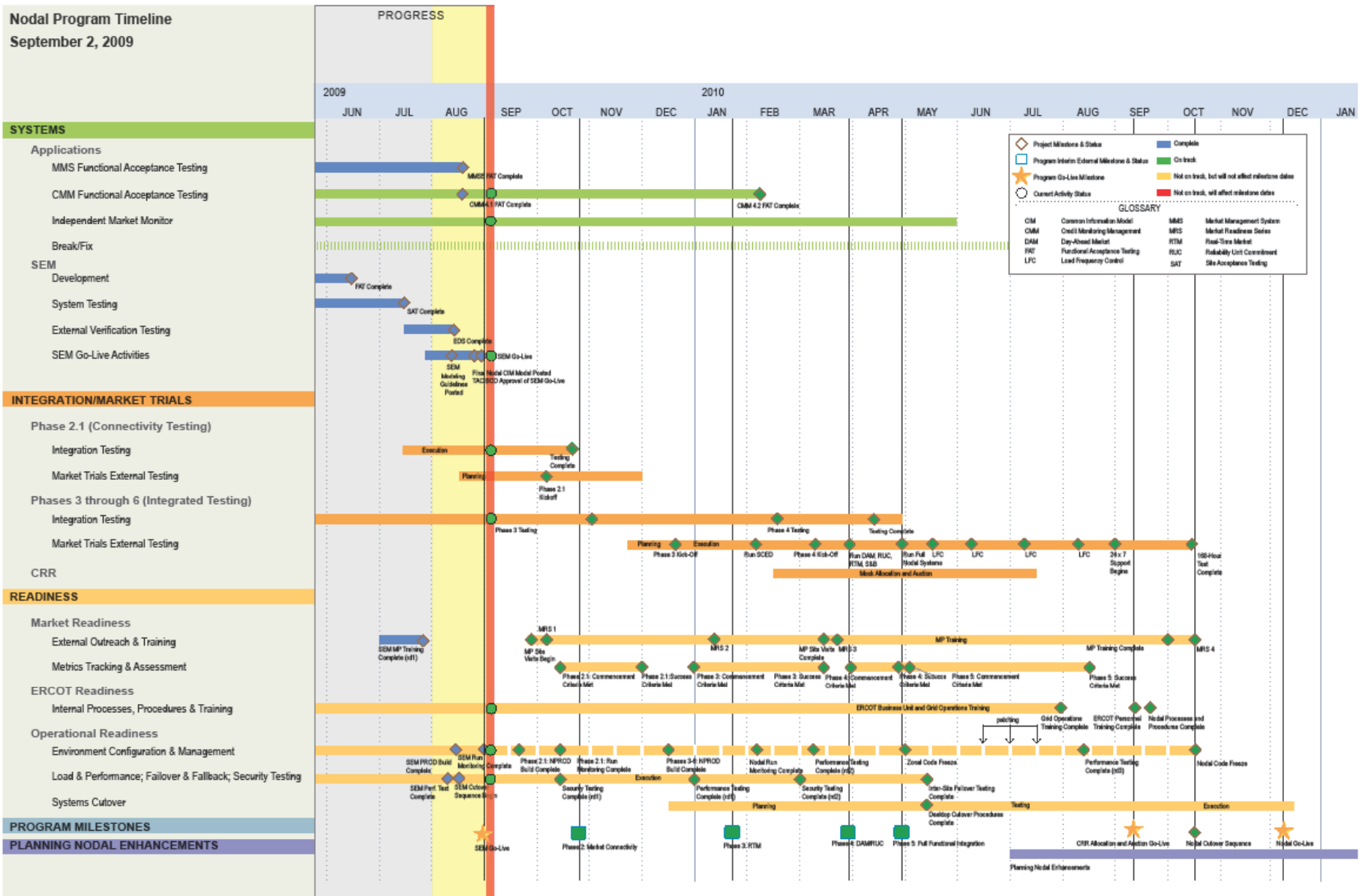
Nodal Systems Blueprint



Nodal Timeline

Nodal Program Timeline

September 2, 2009



Completed Milestones

■ Program Milestone: SEM Go-Live

◆ Included the following project milestones

- Systems/SEM/External Verification Testing
 - EDS complete
- Systems/SEM/Go-Live Activities
 - SEM modeling guidelines posted, final nodal CIM model posted; TAC/BoD approval of SEM Go-Live
- Readiness/Operational Readiness/Environment Configuration & Management
 - SEM PROD build complete, SEM monitoring complete
- Readiness/Operational Readiness/Load & Performance
 - SEM performance test complete, SEM cutover sequence begins

◆ Project Milestones

- Systems/Applications/MMS Functional Acceptance Testing
 - MMS5 FAT complete – Aug. 21
- Systems/Applications/CMM Functional Acceptance Testing
 - CMM4.1 FAT complete – Aug. 21
- Integration Testing
 - All core integration components verified in iTest

Single Entry Model Go-Live Update

- **SEM went live on time Aug. 31**
- **Early results (as of Sept. 4)**
 - No functional issues
 - 8 of 20 TSPs have successfully submitted 130 NOMCRs
 - >75% of Help Desk tickets have been access-related
 - Maximum of 13 concurrent users
 - Additional configuration and performance tuning continues to improve performance
- **Monthly touch points will be established with MPs to verify integrity of network model data**

Integration Project Testing Status

- **Currently realigning interface and adapter testing delivery to future program milestones**
 - Phase 2 (Market Connectivity)
 - Phase 3 (Real-Time Market)
 - Phase 4 (Day-Ahead Market, Reliability Unit Commitment, Settlement & Billing) delivery dates
- **Completed technical verification testing of Phase 2 connectors**
 - Some technical connector testing rescheduled to align with Phase 3 and Phase 4
- **No impact to Nodal Program milestones**

Upcoming Milestones

■ Program Milestones

- Phase 2: Market Connectivity

◆ Project Milestones (30 day look-ahead)

- Readiness/Market Readiness/External Outreach & Training
 - MP site visits begin
- Readiness/Operational Readiness/Environment Configuration & Management
 - Phase 2.1 NPROD build complete
- Inclusion of progress measures

Upcoming Program Milestone Definition

■ Phase 2: Market Connectivity

– Scope

- Market Participant interface testing (API, UI)
- Market System Rules Validation - Phase 1 (as defined in MMS – Explanation of Market Participant Submission Items v0.25 document)

– Objectives

- Make available Market Trials environment with latest version of MMS, Market Manager UI and External Web Services
- Provide MPs access to Market Trials environment to complete development and qualification preparation

– Schedule

- Sept.-Oct.: Bi-weekly Market Calls
- Week of Oct. 5: Kickoff meeting
- Oct. 28: Market Connectivity

Program Measures

- **Current baseline execution index (BEI) and earned value (EV) measures give equally weighted credit for completed tasks**
- **New performance factor will reflect task's completion percentage, with weighting factor for each task (based on the associated effort)**
- **Weighted percentage-completion data rolled up to summary**
 - Performance factor derived solely from summaries
- **Four projects part of initial performance factor index (PFI) computation**
 - Integration Testing (INT)
 - Market Trials (MT)
 - ERCOT Readiness & Transformation (ERT)
 - Operational Readiness Testing (ORT)

* Reference Appendix slides for additional details regarding PFI calculation process

Performance Factor Index (PFI) Current Status

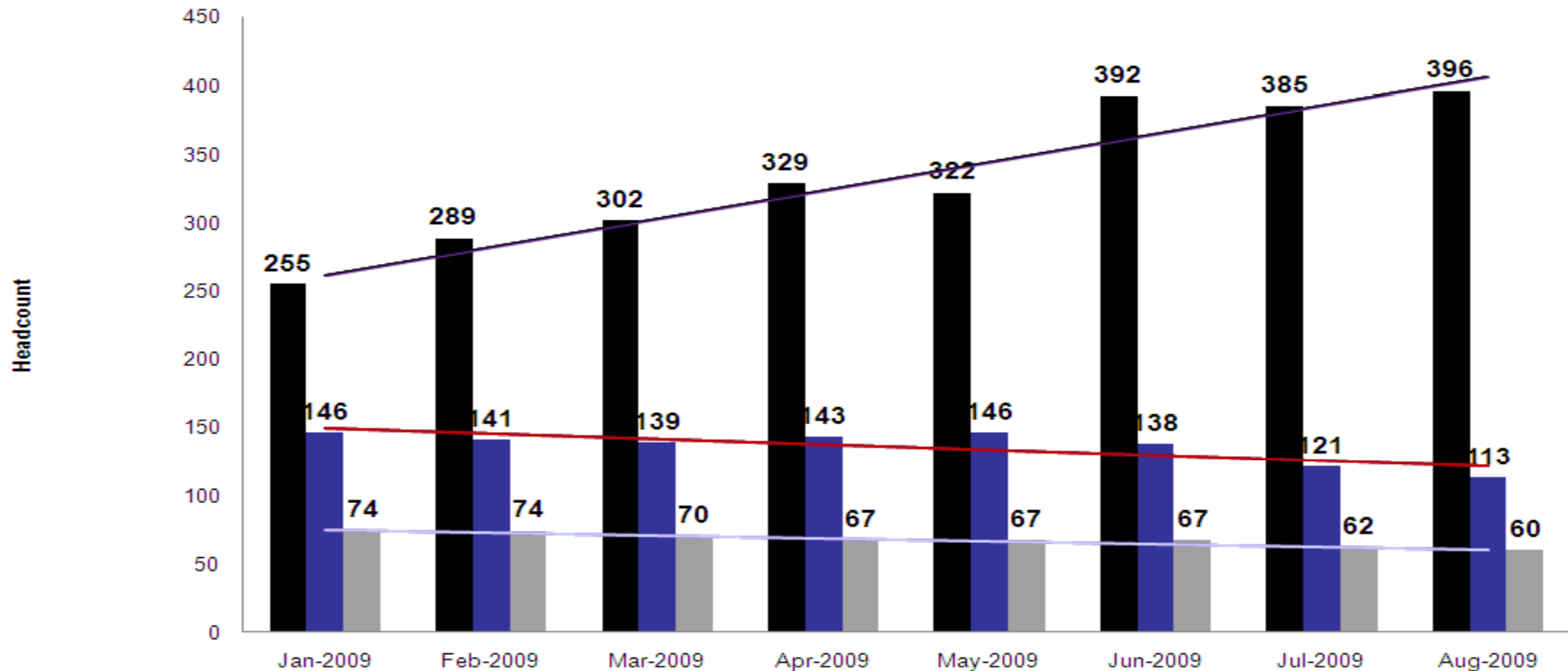
- **Initial baselines and weighting (weighting will be based on initial estimates of effort/work required)**

Project	Weight	Forecast %	Est %	PFI*	Forecast Wgt.*	Est. Wgt.*
ERT	127,359	11.65%	14%	1.20	14,838	17,830
INF	236,728	17.08%	14%	0.82	40,440	33,142
MT	174,399	0%	0%	0.00	0	0
INT	95,145	0%	0%	0.00	0	0
Program	633,631			0.92	55,278	50,972
				<i>* As of July</i>		

- PFI 1.00: optimum; shows program effort on track according to estimated work
- PFI <1.00: program's performance behind budgeted effort; work is slipping based on estimated work
- PFI >1.00: program's performance ahead of the budgeted effort; work is ahead of budgeted work
- PFI should be as near to 1.00 as possible (good work estimation, efficient delivery)

Nodal Internal/External and Vendor Headcount for 2009

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	Jan-2009	Feb-2009	Mar-2009	Apr-2009	May-2009	Jun-2009	Jul-2009	Aug-2009
■ ERCOT Employees	255	289	302	329	322	392	385	396
■ Contingent Labor	146	141	139	143	146	138	121	113
■ Vendor Labor	74	74	70	67	67	67	62	60

Nodal Program Risks & Issues

- **Immediate**
 - Risk: Reconciling protocols, systems and market expectations
 - Risk: Integration Testing
- **Long-Term**
 - Risk: Data Center capacity concerns

Participant Readiness Touch Points

2009

	September	October	November	December
Meetings	<ul style="list-style-type: none"> • NATF 9/1 • NATF 9/29 	<ul style="list-style-type: none"> • NATF 10/27 		<ul style="list-style-type: none"> • NATF 12/8
Training	<ul style="list-style-type: none"> • Nodal 101 • LSE 201 	<ul style="list-style-type: none"> • Nodal 101 • LSE 201 • Generation 101 • Basic Training 	<ul style="list-style-type: none"> • Nodal 101 • LSE 201 • Generation 101, 201 • Economics of LMP • Transmission 101 ◆ Settlement Workshops 	<ul style="list-style-type: none"> • Nodal 101 • LSE 201 • Generation 101, 201 • Basic Training • Economics of LMP • Transmission 101
Outreach	<ul style="list-style-type: none"> • Material preparation • Full schedule confirmation ◆ 3 site visits: w/o 9/28 	<ul style="list-style-type: none"> ◆ Readiness Center • Limited ERCOT metrics • 6 site visits 	<ul style="list-style-type: none"> • Additional ERCOT & MP metrics • 6 site visits 	<ul style="list-style-type: none"> • 3 site visits
Market trials	<ul style="list-style-type: none"> • Last Resource registration data collection window open • Bi-weekly market calls 	<ul style="list-style-type: none"> • Bi-weekly calls ◆ 2010 Market Trials Roadmap: w/o 10/5 ◆ Technical Workshop ■ Market Connectivity open to MPs 	<ul style="list-style-type: none"> • Bi-weekly calls • Voluntary MP connectivity testing ◆ MP Handbooks <ul style="list-style-type: none"> • SCED/LFC • CRR • DAM/RUC 	<ul style="list-style-type: none"> • Bi-weekly calls • Outage Scheduler • Settlement

Protocol Traceability Effort Update

Tier 1 Sections				
	Definition	SME Analysis/Validation	Begin Reviews w/Business	Target for Reports to NATF
Section 7	Congestion Revenue Rights	85-90%	In progress	Sept
Section 8	Performance Monitoring	75%	9/03	Nov*
Section 3	Management Activities for the ERCOT system	40%	9/15	Nov
Section 4	Day Ahead Operations	5%	9/22	Oct
Section 5	Transmission Security Analysis and RUC	5%	9/29	Nov
Section 9	Settlement & Billing	5%	10/01	Nov
Section 6	Adjustment Period and Real-Time Operations	15%	10/20	Dec
Section 17	Market Monitoring and Data Collection	0%	10/22	Dec
Section 16.11	Financial Security for Counter-Parties	0%	10/27	Dec

Tier 2 (Moderate Impact): 10, 11, 12, 13, 20, 22 (Dec. '09 completion target)
Tier 3 (Low Impact): 1, 2, 14, 15, 18, 19, 21, 23, 24 (Nov. '09 completion target)

* Delays in approving performance criteria may affect date.





Monthly Financial Review

Steve Byone

The nodal financials will not be available until Sept. 14.

Questions?

Appendix

Outreach Candidates

ERCOT is proactively contacting the following entities to request a site visit. Additional participants will be accommodated where the schedule permits.*

- **AEP**
- **ANP**
- **APX**
- **Austin Energy**
- **BP**
- **Brazos**
- **BTU**
- **Calpine**
- **CPS Energy**
- **Constellation**
- **Direct Energy**
- **Eagle Energy**
- **Exelon**
- **Garland**
- **LCRA**
- **Luminant**
- **Nextera/FPL Energy**
- **NRG Texas**
- **Occidental**
- **Shell**
- **STEC**
- **Suez**
- **Tenaska**
- **Topaz Energy**

* Represents:

- Level IV QSE
- NATF participation
- Vendor diversity

Program Risk: Reconciling Protocols, Systems and Market Expectations

◇ Potential Milestone Impact: Market Trials

Risk: Reconciling Protocols, Systems and Market Expectations				Experience with deploying nodal markets by other ISOs has shown that expectations of the market participants are often missed, despite best efforts at defining tariffs or protocol requirements. ERCOT needs to assume such a risk exists for this nodal implementation as well.		
Risk Life Cycle State						
Define	Plan	Manage	Watch			
Mitigation Plans				Who	Target Date	Current Status
1. Assess maturity and readiness of software in the initial nodal release, focusing on new/tailored capability for Texas Nodal.				B. Day K. Farley	Tier 1: 10/5/09 Tier 2: 12/15/09 Tier 3: 11/30/09	8/7/09 – Work is underway to trace protocols, requirements and business processes alignment analyses are in progress.
2. Add team members to the nodal program with Texas market experience to ensure readiness for Market Trials. SMEs will report requirements to testing traceability gaps to ERCOT business owners for resolution.				B. Day K. Farley	Ongoing	8/7/09 – SMEs were added to the team in May. Work is underway to trace protocols, requirements and business processes alignment analyses are in progress.
3. Keep the oversight groups apprised of progress.				M. Cleary	Ongoing	4/13/09 Risk incorporated into the set being reported externally; will be maintained actively.

Program Risk: Integration Testing

◇ Potential Milestone Impact: Market Trials

Risk: Integration Testing				Continued risk around technology delivery of business systems integration due to complexity and continuing maturing of application and data dependencies.		
Risk Life Cycle State						
Define	Plan	Manage	Watch			
Mitigation Plans				Who	Target Date	Current Status
<ul style="list-style-type: none"> Planned Integration Test phases and associated functional and technology components. Created effort-based testing delivery work plan to prioritize and align deliverables to key external milestones. Instituted daily PMO meetings to manage and mitigate day-to-day risks to scope and schedule deliverables. 				PMO	Ongoing	9/2/09 – Planning of Test phases and associated work plan has been completed Execution of work plan, with specific focus on October Market Trials functionality has begun

ERCOT-Wide Risk: Data Center Capacity Concerns

◇ Potential Milestone Impact: Nodal Go-Live

Risk: Data Center Capacity Space Concerns		Data center capacity, space, and power may be inadequate for Nodal go-live, unless plans for expansion are adequate.		
Risk Life Cycle State				
Define	Plan	Manage	Watch	
Mitigation Plans		Who	Target Date	Current Status
1. Establish an Information Lifecycle Management approach to manage the life cycle of data being managed.		D. Forfia	Implementation expected Q1 2010 for Retail Applications	ERCOT project PR 90006_01 Commercial Systems Information Lifecycle Management Project will be presenting as an update during the October Board of Directors Meeting, and will request Execution and Funding approval at the November Board of Directors Meeting
2. Expand current data center space, and build out new data center, to increase ERCOT data center capacity.		D. Forfia	TCC1 build out is complete Bastrop DC in production Feb 2011 TCC3 in production May 2011	TCC Expansion commissioned as of 9/2/09
3. Validate and monitor Nodal data capacity assumptions for Go Live		D. Forfia	Ongoing	7/17/09 Status reports are provided to the Board of Directors in executive sessions

PFI Calculation Process: Step 1

- For each project *Forecasted Hours to Date* and *Total Forecasted Hours* will be transferred from the EAC (i.e., budget) documentation, from which a *Forecast Percent Complete* will be computed

Project	BL Start	BL Finish	Weight	Fcst Hrs to Date	Total Fcst Hrs	Fcst %
ERT	1-Jun-09	31-Dec-10	127,359	14,838	127,359	11.65%
ORT	1-Jun-09	31-Dec-10	236,728	40,440	236,728	17.08%
MT	1-Oct-09	1-Dec-10	174,399	0	174,399	0.00%
INT	1-Sep-09	31-Jul-10	95,145	0	95,145	0.00%

PFI Calculation Process: Step 2

- At the end of each month the PMs will use agreed upon criteria to determine their *Estimated Percent Complete*, which when divided by the *Forecast Percent Complete* will determine the *PFI* for each project

Project	Fcst %	Est %	PFI
ERT	11.65%	14.00%	1.20
ORT	17.08%	14.00%	0.82
MT	0.00%	0.00%	0.00
INT	0.00%	0.00%	0.00

- It is critical that these *Estimated Percent Completes* are arrived at using agreed upon definitive criteria so that they accurately represent the status of the project

PFI Calculation Process: Step 3

- The individual *PFI*s for each project will be used to compute the *Nodal Program PFI* by applying an hours based weighting factor for each project
- *Forecast Weight* will be determined by multiplying the *Forecast Percent Complete* by the *Weight (Work)* for the project
- *Estimated Weight* will be determined by multiplying the *Estimated Percent Complete* by the *Weight (Work)* for the project
- These 2 weights will be totaled for the Nodal program and the *Estimate Weight* divided by the *Forecast Weight* will produce the *Nodal Program PFI*

Project	Weight	Fcst %	Est %	PFI	Fcst Wgt	Est Wgt
ERT	127,359	11.65%	14.00%	1.20	14,838	17,830
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