Texas Nodal Market Implementation: Program Update

Janet Ply

Nodal Program Manager

Special Nodal Program Committee

21 April 2009

Agenda

- **Nodal Update**
  - Timeline
  - Milestones
  - Risks/Issues
  - People
  - Program Initiatives
- **Financial Management/CFO Transition**
- **Financial Review**
- **External Audits**
- **Nodal Testing Environments/Software Migration**
  - Nodal Testing Phases
  - Characteristics of Nodal Environments
  - Software Release Management

Timeline
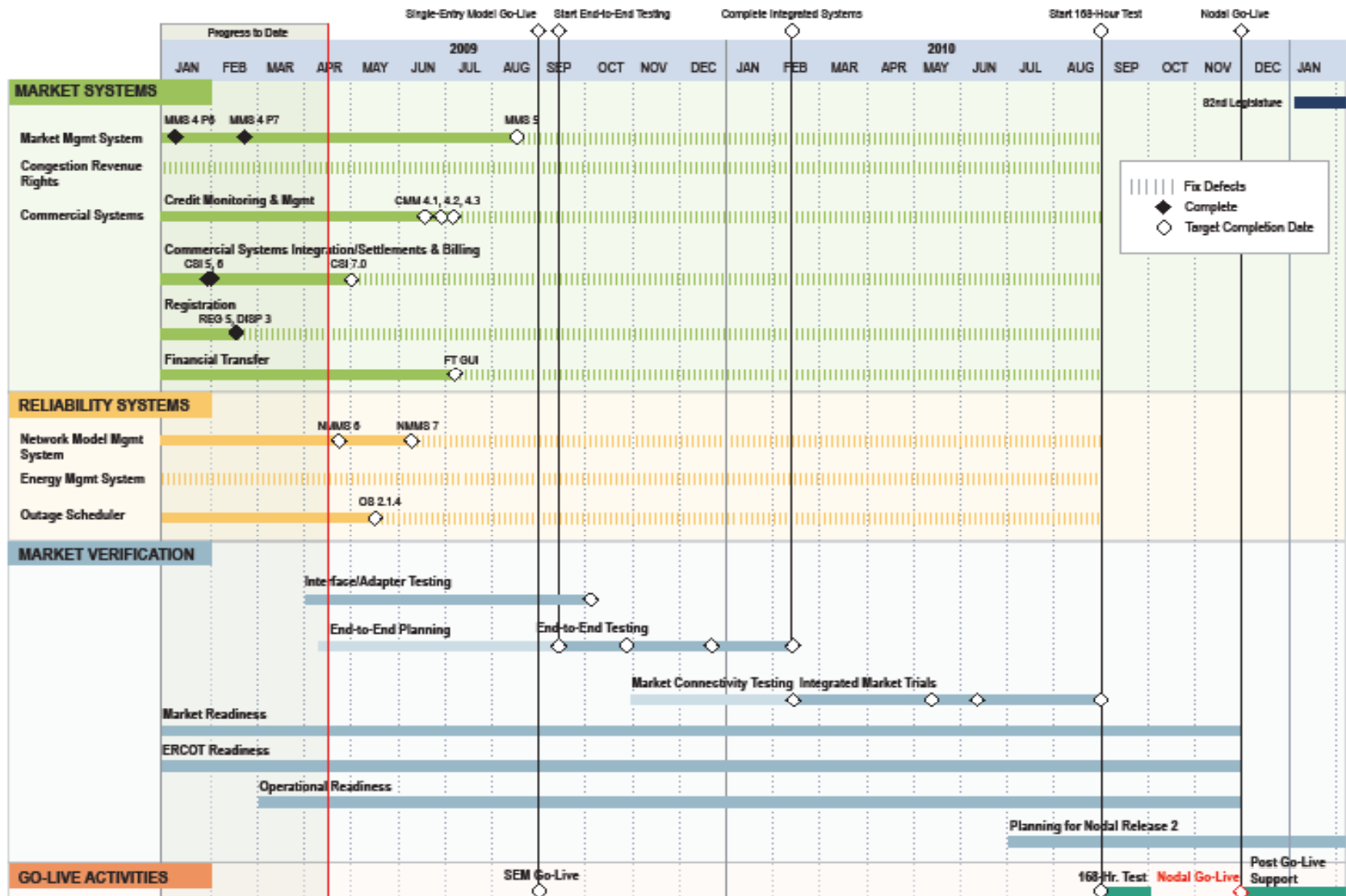
Milestones Performance

Tracking Milestones Scheduled — March 2009

Proj	Name	%	Baseline	Forcast	Actual	Variance
EDS	Publish Extract DDL To MPs	100%	3/3/09	3/3/09	3/3/09	0 days
EDS	Publish User Guides To MPs	100%	3/3/09	3/3/09	3/3/09	0 days
NMMS	Deliver Validated Model With Final RARF Data (V	100%	3/6/09	3/6/09	3/6/09	0 days
MMS	MMS5 Pre-FAT Start	100%	3/16/09	3/16/09	3/16/09	0 days
CRR	CRR 4 Available in FAT	100%	3/17/09	3/17/09	3/17/09	0 days
EIP	EIP.WS1.18C Delivery Completed	100%	3/19/09	3/19/09	3/19/09	0 days
EDW	Development of Regulation Reporting Suite Compl	100%	3/20/09	3/20/09	3/20/09	0 days
EDW	EMS 6.5.X EDW Reports' Requirements	100%	3/20/09	3/20/09	3/20/09	0 days
OS	Deliver OS FP 1 To iTEST	100%	3/24/09	3/24/09	3/24/09	0 days
EDW	EMS 6.2.x EDW Reports' Requirements Complete	100%	3/27/09	3/27/09	3/27/09	0 days
EIP	EIP.ExtDoc.EIS V1.18 Approval	100%	3/27/09	3/27/09	3/27/09	0 days
INT	I-A: Interfaces & Adapters Replaining Complete	100%	3/31/09	3/31/09	3/31/09	0 days
EDS	Publish Revised Draft Validation Rules For MP Re	100%	3/31/09	3/31/09	3/31/09	0 days
COMS CMM	CMM 4.1 Development Complete	100%	3/31/09	4/3/09	4/3/09	3 days

- 14 tracking milestones identified for March
- All March milestones were completed against the re-baselined schedule

Tracking Milestones Planned — April 2009

Proj	Name	%	Baseline	Forcast	Actual	Variance
COMS CMM	CMM 4.1 Development Complete	100%	03/31/09	04/03/09	04/03/09	3 days
EIP	EIP.WS1.18C2.Delivery Completed (OS2.1.3 Compatibi	100%	04/09/09	04/09/09	04/09/09	0 days
MIS	MIS Build 12 Start	0%	04/14/09	04/10/09	NA	-2 days
ENV	Deliver Completed iTest Environment To I-A Testing	100%	04/10/09	04/10/09	04/10/09	0 days
MMS	MMS5 Pre-FAT Release To FAT Testing	0%	04/15/09	04/15/09	NA	0 days
MMS	MMS5 FAT Start	0%	04/15/09	04/15/09	NA	0 days
OS	2.1.4.0 OS FAT Start: Delivered By ABB	0%	04/17/09	04/17/09	NA	0 days
EDW	Deliver State Estimator Statistics Extract EMS Phase 3	0%	04/17/09	04/17/09	NA	0 days
COMS CSI	Deliver CSI 7.0 - Migration To ITEST	0%	04/23/09	04/23/09	NA	0 days
EMS	EMS Release 6.5.x SPR Patch 2 FAT Complete	0%	04/24/09	04/24/09	NA	0 days
NMMS	Deliver NMMS 6 To iTEST	0%	04/07/09	04/27/09	NA	14 days
CRR	Final Approval - CRR NPRR 140	0%	04/29/09	04/29/09	NA	0 days
MIS	MIS Build 11 Complete	0%	05/01/09	04/29/09	NA	-2 days

- 13 tracking milestones scheduled for April

Nodal Program Risks & Issues

- **Single-Entry Model Go-Live**
  - Issue: Additional NMMS defects threaten SEM Go-Live

- **Complete Integrated Systems**
  - Risk: Resource conflict for Advanced Metering and Nodal Program
  - Issue: Zonal resource constraints for Nodal Program

- **Market Trials**
  - Risk: Reconciling Protocols, Systems and Market Expectations

- **Nodal Go-Live**
  - Risk: Data Center capacity concerns

Nodal Program Issue:
Additional NMMS Defects Threaten SEM Go-Live

◇ **Potential Milestone Impact: SEM Go-Live**

Issue: Handling Additional NMMS Defects		Defects found in Functional Acceptance Test (FAT) for the NMMS release 6 deliveries are taking longer to resolve than anticipated, and further delays can impact the Single Entry Model (SEM) Go-Live date (8/31/09).		
Issue Life Cycle State				
Plan	**Manage**			
Mitigation Plans		Who	Target Date	Current Status
1. Accept patch updates to NMMS 6 during the FAT testing, to maintain momentum toward FAT completion.		T. Nielsen	4/27/09	4/14/09 Siemens patch is under development, with a delivery date to be scheduled pending successful tests.
2. Identify a possible workaround to deal with the file size limitations which are causing the defect.		T. Nielsen	4/27/09	4/14/09 Siemens has been asked to provide guidance about what file sizes would work. If the patch is successful, it will eliminate the need for a workaround.
3. Do remote testing of the Siemens release remotely at the Siemens site as soon as a patch is available, to minimize installation/defect detection churn.		T. Nielsen	Ongoing	4/7/09 This practice is in place to deal with situations like this, in order to minimize time to conclusively test any changes.

Nodal Program Risk:
Resource Conflict for Advanced Metering and Nodal Program

◇ **Potential Milestone Impact: Complete Integrated Systems**

Risk: Advanced Metering Resources				Advanced Metering is a high priority project for 2009. There are now potential conflicts in 2009 over resources and testing environments needed at the same time by the nodal program and Advanced Metering project. [note: this is an instance of resource conflicts being monitored and managed with the ERCOT PMO]	
Risk Life Cycle State					
Define	**Plan**	Manage	Watch		
Mitigation Plans		Who	Target Date		Current Status
1. Establish a testing approach to use different environments for the Lodestar testing. Limit shared testing to just the single shared ISM environment during testing in Q4 2009.		H. Parrish S. Jirasek	7/24/09		4/2/09 Test strategy is complete for Advanced Metering. It will be incorporated into the nodal test plan for end-to-end testing during the end-to-end planning.
2. Arrange resource assignments for Lodestar and EDW to ensure coverage by development teams and business team resources to allow for parallel nodal program work and Advanced Metering work, to support the Advanced Metering mandate of January 2010 and nodal go-live date of December 2010.		H. Parrish S. Jirasek	7/24/09		4/2/09 Resource planning is underway, with current expectations that coverage will be sufficient. Plans will be incorporated into the nodal test plan for end-to-end testing during the end-to-end planning.
3. Monitor resource assignments and availability.		H. Parrish S. Jirasek	November, 2009		

ERCOT-Wide Issue:
Zonal Resource Constraints for Nodal Program

◇ **Potential Milestone Impact: Complete Integrated Systems**

Issue: Zonal Resource Constraints for Nodal Program	Because the Nodal go-live date has been delayed, there are a number of Zonal projects, PRRs, and IMM suggestions for Zonal improvements are resulting in resource constraints for the Nodal Program.		
Issue Life Cycle State			
Plan **Manage**			
Mitigation Plans	**Who**	**Target Date**	**Current Status**
1. Manage list of PRRs and SCRs to a resource plan that uses a strategy to avoid impacting Nodal personnel resources when delivering additional Zonal enhancements.	D. Forfia	Ongoing	4/10/09 – Scheduled meeting to review Zonal portfolio 1/30/09 – Completed review with PRS and WMS on the current list of reconsidered and new PRRs and SCRs. No expected impact to Nodal. Updates will be provided to Nodal PMO as the list evolves. April/09 – To review the list with TAC
2. Manage Project Priority List (PPL) with clear view of resources needed for any projects in flight or about to be launched, with a strategy to avoid impact on Nodal personnel resources.	D. Forfia	Ongoing 4/17/09 – complete an "on request" analysis with nodal resources as identified during recent nodal re-forecast activity	4/2/09 ERCOT PMO will continue regular review of resource plans for projects on the PPL to detect any potential impact to resources also allocated to nodal work, as well as "on request" comparison of nodal resource allocations against those loaded for the PPL. Frequency of these reviews will increase to monthly instead of quarterly. 3/27/09 Potential conflict is under review for resources needed to work on Advanced Metering project.

Nodal Program Risk:
Reconciling Protocols, Systems and Market Expectations

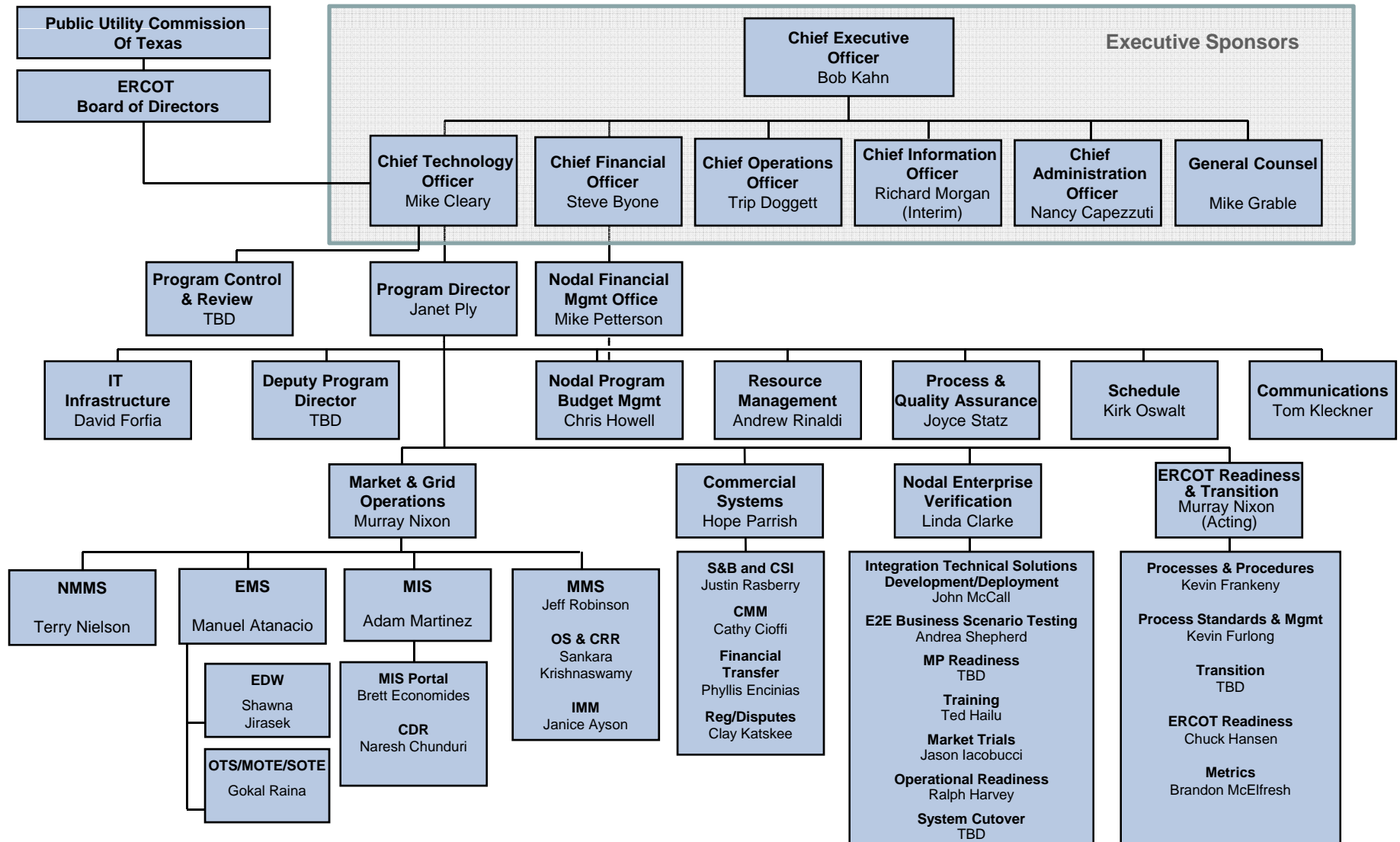◇ **Potential Milestone Impact: Market Trials**

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.	Nodal Project Managers	7/1/09	4/13/09 Program is planning the assessment activities.
2. Add team members to the nodal program with Texas market experience to ensure readiness for Market Trials. Have them assess completeness of requirements addressed by the software new/tailored for the Texas nodal market and participate in end-to-end testing.	J. Ply	8/1/09	4/13/09 Two candidates have been approached regarding their involvement; additional candidates from other areas of the market are yet to be identified.
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.

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 Program 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 ongoing	3/31/09 ILM Roadmap has been completed by SAIC, and next planning activities underway ERCOT project PR 90006_01 Commercial Systems Information Lifecycle Management: Project	
2. Expand current data center space, and build out new data center, to increase ERCOT data center capacity.	D. Forfia	TCC1 build out complete 9/09 South DC in production Feb 2011 TCC3 in production May 2011	3/30/09 Work underway to expand current TCC1 data center ERCOT project PR_80047 TCC1 equipment to be purchased May 2009. ERCOT project PR_80001 South DC will run parallel Oct 2010 – Feb 2011 to test and avoid disruption to Nodal	
3. Validate and monitor Nodal data capacity assumptions	D. Forfia	May 2009	Study underway to validate current assumptions	

Nodal Program Organization

Public Utility Commission Of Texas

ERCOT Board of Directors

Executive Sponsors

Chief Executive Officer
Bob Kahn

Chief Technology Officer
Mike Cleary

Chief Financial Officer
Steve Byone

Chief Operations Officer
Trip Doggett

Chief Information Officer
Richard Morgan (Interim)

Chief Administration Officer
Nancy Capezzuti

General Counsel
Mike Grable

Program Control & Review
TBD

Program Director
Janet Ply

Nodal Financial Mgmt Office
Mike Petterson

IT Infrastructure
David Forfia

Deputy Program Director
TBD

Nodal Program Budget Mgmt
Chris Howell

Resource Management
Andrew Rinaldi

Process & Quality Assurance
Joyce Statz

Schedule
Kirk Oswalt

Communications
Tom Kleckner

Market & Grid Operations
Murray Nixon

Commercial Systems
Hope Parrish

Nodal Enterprise Verification
Linda Clarke

ERCOT Readiness & Transition
Murray Nixon (Acting)

NMMS
Terry Nielson

EMS
Manuel Atanacio

MIS
Adam Martinez

MMS
Jeff Robinson

OS & CRR
Sankara Krishnaswamy

IMM
Janice Ayson

EDW
Shawna Jirasek

MIS Portal
Brett Economides

CDR
Naresh Chunduri

OTS/MOTE/SOTE
Gokal Raina

S&B and CSI
Justin Rasberry

CMM
Cathy Cioffi

Financial Transfer
Phyllis Encinias

Reg/Disputes
Clay Katskee

Integration Technical Solutions Development/Deployment
John McCall

E2E Business Scenario Testing
Andrea Shepherd

MP Readiness
TBD

Training
Ted Hailu

Market Trials
Jason Iacobucci

Operational Readiness
Ralph Harvey

System Cutover
TBD

Processes & Procedures
Kevin Frankeny

Process Standards & Mgmt
Kevin Furlong

Transition
TBD

ERCOT Readiness
Chuck Hansen

Metrics
Brandon McElfresh

People

- **Ralph Harvey**
  - 14 years experience in utility markets
  - PJM , SEEBOARD Plc, Southern Electric, Scottish Power
  - Designed rules, patterns for demand-response, energy management systems

- **Jason Iacobucci**
  - 12 years experience with energy market designs, implementation
  - ERCOT, CAISO, PJM, ISO-New England, GridSouth, SPP, MISO, BC Transmission
  - Advised CAISO on $200M MRTU, delivered new market-settlements system

- **John McCall**
  - 11 years experience in energy/utility sector
  - MISO (ancillary services, day-ahead, real-time and financial-transmission markets)
  - Architect of MISO's infrastructure components

- **Andrew Rinaldi**
  - 4 years experience in energy market process and resource planning
  - PJM (market operations, IT, control center)
  - Conducting talent assessment across nodal program

- **Andrea Shepherd**
  - 7 years experience implementing wholesale electricity markets
  - MISO, EirGrid market launches; CAISO (market simulation)
  - Supported PG&E, CDWR preparations for CAISO's nodal market

Program Initiatives

- **Re-Forecasting Estimates at Completion (EACs)**
  - Ongoing improvement of budgets by managing budgets downward and basing new EACs on current information.
  - Re-forecast s will be done monthly; forecast baselines will be updated quarterly.

- **Nodal Contract Renegotiations**
  - Engaged EquaTerra to provide third-party, vendor-contract negotiations support.
  - Prioritized contracts of five key vendors, assessing largest contract.
  - Assess agreements for two additional vendors by May 15.
  - On target to complete all assessments and renegotiate vendor contracts by June 30.

- **Staffing Assessments**
  - Hired resource manager (Andrew Rinaldi) to ensure the right people have the right skills and to ensure the right mix of employees to contractors.
  - Initial project team assessments to be completed by April 24.
  - Re-forecasting staffing to show actuals against forecast.

- **Market Participant Readiness**
  - Interviewing candidates to lead this initiative.
  - Selected individual will develop and execute strategy to support MP training, readiness metrics and communications.

- **Managing Deferred Functionality**
  - Currently tracking all deferred functionality through Change Control Board.
  - Working to develop strategy on how to implement deferred functionality post go-live.
    - Timeline for subsequent releases
    - Prioritization process

Nodal Financial Management
CFO Transition Update

Nodal Financial Management Office Update

- **Chief Technology Officer (CTO) and Chief Financial Officer (CFO) have joint focus on rebuilding financial credibility of Nodal Program**
- **Developed and communicated to Nodal project management personnel *Guiding Financial Management Principles***
  - Transparency
  - Open Communications
  - Fact-Based Estimates
  - Prudence
  - Accountability
- **Established the Financial Management Office (FMO) group, reporting to CFO**
- **Developing Nodal PMO – FMO partnership and interaction model**
- **Established timeline and plan to deliver FMO reviewed 'Estimate to Complete' and 'Earned Value' at the May and June 2009 Board meetings, respectively**
  - Initial estimates in May and June with continuous improvements

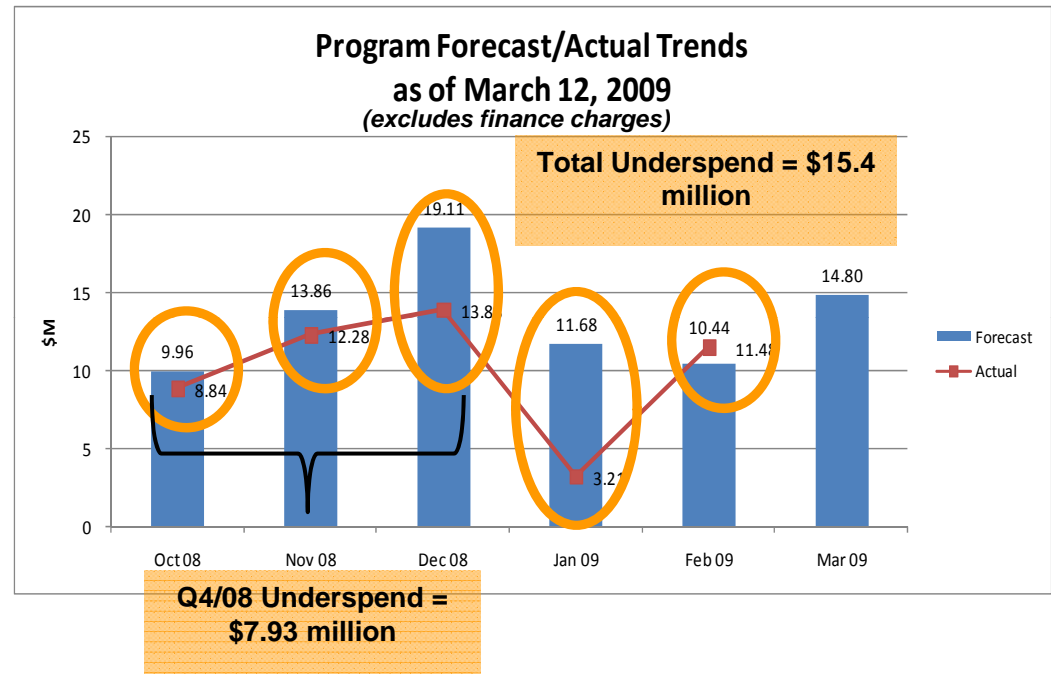# Initial Nodal Program Financial Management Observations

- **Large, complex and manually intensive spreadsheet-driven Nodal financial reporting and budgeting processes**
- **ERCOT Accounting systems not designed for large scale project accounting and require significant, error-prone manual processes**
- **Lack of conceptual consistency and inconsistent reporting during transition between budgets**
- **Significant miscommunication and/or incomplete processes between ERCOT Accounting and Project Managers/Nodal Controllers**
- **Nodal Program financial skills require improvement**

Budget Transition Recap

- **Historical Financial Analysis Recast (through February 2009)**
  - During Q4 2008 period, monthly variances between actual spend and re-budgeted spend were reflected in February 17, 2009 approved budget as adjustments to the contingency balance.
    - Q4 2008 "underspend" of $7.9 million (direct costs plus allocations) and $0.4 million (finance charges) resulted in increases to contingency
  - $15.4 million favorable variance (excluding finance charges) reported in March 17, 2009 Board update. Can be summarized as follows:
    - Oct-Dec 2008 "underspend" was subsumed in the $58.6 million contingency reflected in the new $643.8 million budget
    - Jan-Feb 2009 "underspend" is pending quarterly contingency process

**Program Forecast/Actual Trends
as of March 12, 2009**
(excludes finance charges)

Total Underspend = $15.4 million

	Forecast	Actual
Oct 08	9.96	8.84
Nov 08	13.86	12.28
Dec 08	19.11	13.8
Jan 09	11.68	3.2
Feb 09	10.44	11.4
Mar 09	14.80	

$M

Q4/08 Underspend = $7.93 million

As presented at March 2009 Board meeting

ERCOT

Budget Transition Recap – cont'd

- **January 2008 $319.5 million approved budget**
  - Provided budget authority of $317.1 million through December 2008
  - Actual spend of $332.4 million (preliminary) through December 31, 2008
  - Therefore, consumed entire $15.0 million contingency plus $15.3 million overage
  - Month-to-month budget authority received from Board prior to commitments which resulted in overage

- **February 2009 $658.7 million approved budget**
  - Revised Approved Nodal surcharge in March 2009 to attain 40% equity ratio at Go-Live; resulted in $14.9 million budgeted finance charge reduction
  - Final Nodal Program cost filed for recovery totals $643.8 million; assumed interest rate of 6.0%
  - Subsequent to Feb 2009 Board approved Nodal Budget, 2008 year-end adjustments totaling $4.0 million were recorded
  - $54.6 million contingency available at December 31, 2008

As of December 31, 2008	Amounts in millions
Approved budget	$643.8
Less: Project spend LTD, Dec 08	(332.4)
Less: Project spend remaining	(188.1)
Less: Finance charge remaining	(64.7)
Preliminary Contingency	**$58.6**
Final 2008 Nodal Program Cost adjustments	(4.0)
Available Contingency	**$54.6**

Financial Review

Monthly Financial Review - March 2009 Performance

Nodal Program
Approved Budget to Actual Comparison
Month of March 2009

(Amounts in millions)

Line	Cost Summary	Budget	Actual	Variance	Cummulative Variance *(Pending Contingency Mgmt Disposition)*
1	Internal Labor Costs	$2.6	$1.5	$1.1	$2.4
2	Backfill Labor Costs	0.1	0.2	-0.1	-0.2
3	External Resource Costs	7.3	4.3	3.0	6.0
4	Software & Software Maintenance	1.0	0.4	0.6	0.6
5	Hardware & Hardware Maintenance	2.8	1.0	1.8	2.1
6	**Sub-total Direct Project Costs**	**$13.8**	**$7.4**	**$6.4**	**$10.9**
7	**Contingency Costs**	**$0.0**	**$0.0**	**$0.0**	**$0.0**
8	Allocations & Other	$0.9	$0.3	$0.6	$4.7
9	Finance Charges	1.2	0.6	0.6	0.7
10	**Sub-total Indirect Project Costs**	$2.1	$0.9	$1.2	$5.4
11					
12	Total	**$15.9**	**$8.3**	**$7.6**	**$16.3**

Nodal Program
Approved Budget to Actual Comparison
Life-to-Date through March 2009
(amounts in millions)

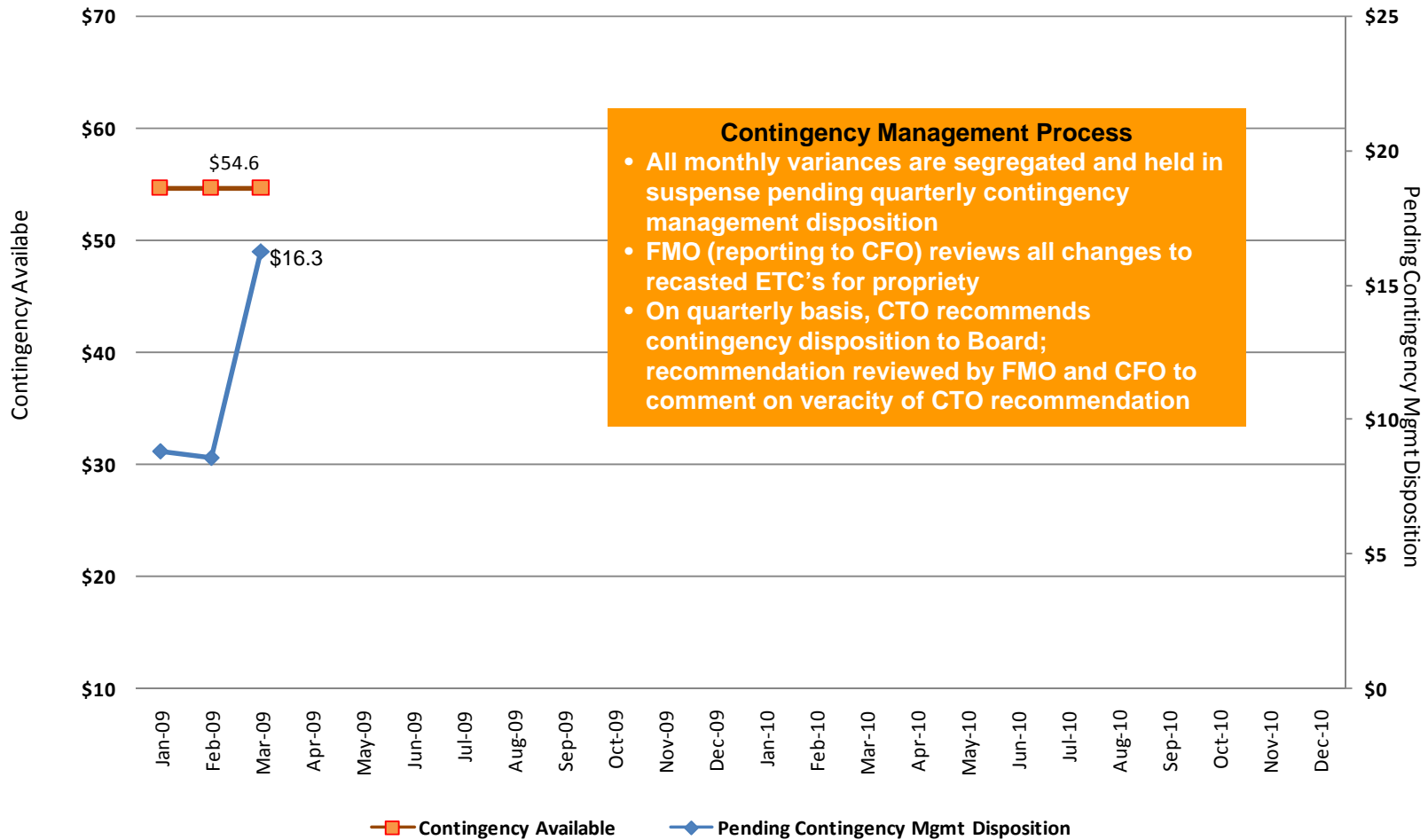| Line	Cost Summary	Budget	Actual	Cummulative Variance * *(Pending Contingency Mgmt Disposition)*	Budget Remaining
1	Internal Labor Costs	$40.0	$37.6	$2.4	$45.9
2	Backfill Labor Costs	4.2	4.4	-0.2	4.5
3	External Resource Costs	219.7	213.7	6.0	72.8
4	Software & Software Maintenance	24.3	23.7	0.6	13.4
5	Hardware & Hardware Maintenance	48.5	46.4	2.1	6.0
6	**Sub-total Direct Project Costs**	**$336.7**	**$325.8**	**$10.9**	**$142.6**
7	**Contingency Costs**	**$0.0**	**$0.0**	**$0.0**	**$54.6**
8	Allocations & Other	$23.3	$18.6	$4.7	$8.9
9	Finance Charges	16.6	15.9	0.7	61.1
10	**Sub-total Indirect Project Costs**	**$39.9**	**$34.5**	**$5.4**	**$70.0**
11					
12	Total	**$376.6**	**$360.3**	**$16.3**	**$267.2**

* Note: Effective with February 17, 2009 approved budget, LTD budgeted spend set to actual spend through December 31, 2008; accordingly, cumulative variance "reset" as of January 1, 2009.

Contingency Monitoring
(Amounts in millions)

Contingency Management Process
- **All monthly variances are segregated and held in suspense pending quarterly contingency management disposition**
- **FMO (reporting to CFO) reviews all changes to recasted ETC's for propriety**
- **On quarterly basis, CTO recommends contingency disposition to Board; recommendation reviewed by FMO and CFO to comment on veracity of CTO recommendation**

Contingency Available

Pending Contingency Mgmt Disposition

$54.6

$16.3

Legend: —■— Contingency Available —◆— Pending Contingency Mgmt Disposition

Monthly Budget to Actual Variance
January 2009 through "Go-Live"
(Amount in millions)

Note: Post-2010 amounts are primarily additional debt service costs

Legend: ■ Monthly Budget ■ Monthly Actual ── Budget Spend ── Actual Spend

Program Initiatives

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- **Market Participant Readiness**
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- **Managing Deferred Functionality**
  – Currently tracking all deferred functionality through Change Control Board.
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    - Timeline for subsequent releases
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External Audits

External Audit Status Summary

Audit	Audit Points Identified	Audit Points in Execution	Date to Complete Last Point
IBM Report 6	4	1	8/31/09
IBM Report 7	4	1	12/31/09
Utilicast Report 8	6	2	2011
Utilicast Report 9	9	6 complete - to be verified; 1 in execution	4/30/09

Audit Points to Address from Utilicast Report 8

ID	Description	Action Plan	Responsible Manager	Target Date/Status
UTI08-01	The individual project budgets should be challenged in the following areas: a. Vendor contracts b. Contract staff c. Internal staff	a. Long –term vendor contracts will be negotiated with the assistance of a 3rd party negotiator, to address budget matters as well as others. b, c. Plans for use of contract staff, as well as the orderly transition to ERCOT teams are being examined, as we refine the schedule and plan for the remainder of the schedule	Janet Ply	a) Target: 6/30/09 for contracts to be renegotiated for 5 top vendors 4/15/09 Third party negotiator reviewing two more vendor contracts 3/31/09 Third party was engaged to assess one vendor contract. Provided findings and recommendations and drafted ERCOT's position (complete) 3/3/09 Have completed one review of our key contracts by an outside firm b) 3/30/09 resourcing of remaining effort shows growth in size of ERCOT teams and reduction of contract staff as testing effort is re-planned incrementally ; Program has engaged a resource manager to review all staffing.
UTI08-05	There should be immediate investment in new data center capacity to allow for expansion of IT infrastructure to support the Nodal Program.	A project has been initiated to expand the data center in Taylor (PR-80047). Planned occupancy date is September 2009. Additional data center space planned as part of the Met Center disposition project (PR-80001). Those data centers should be online in early 2011.	Jeff Floyd	4/15/09 Work is underway to expand the data center in Taylor TCC1 Completion of new data centers is to be Early 2011

Audit Points to Address from Utilicast Report 9 - 1

ID	Recommendation	Action Plan Status	Responsible Manager	Target Date
UTIL09 -02	The scope of system integration testing (end-to-end testing) should be limited to confirming that the individual applications can operate as a single enterprise solution.	Communication to leaders was done on 2/18/09, and they carried the information to their teams that week. 2/26/09 End to End scenario criteria are under development.	L. Clarke	3/31/09 Complete; to be verified by Utilicast
UTIL09 -03	Clearly define and communicate the scope, objectives and expected deliverables of the core system integration components	2/23/09 The approach has been communicated. Project Managers are in the re-planning process.	L. Clarke	3/31/09 Complete; to be verified by Utilicast
UTIL09 -05	Appoint qualified leaders with clear ownership of clearly defined deliverables to the key system integration roles.	3/23/09 – People are now on-site working with the program for 4 of 5 positions: Person for Data Management position to be on-site 4/6/09.	L. Clarke	3/31/09 Complete; to be verified by Utilicast
UTIL09 -07	Define and implement (in conjunction with the Market Participants) the specification for the volume and content of information transmitted over external web services.	3/20/09 Language was drafted for inclusion in the External Interface Specification and software changes were identified. Formal communication of these changes was made on 3/20 during an EDS call.	B. Brandaw	3/17/09; Complete; to be verified by Utilicast

Audit Points to Address from Utilicast Report 9 - 2

ID	Recommendation	Action Plan Status	Responsible Manager	Target Date
UTIL09-06	Update project plans and budgets based on revised integration scope, objectives, roles and responsibilities.	4/15/09 – The integrated project schedule is being updated with detailed plans for end to end testing; resources are being reviewed against the plans	Nodal Project Managers and J. Ply	3/31/09; revised to 4/30/09
UTIL09-08	Build and configure a dedicated integration test environment.	4/15/09 Smoke Testing is underway; all known items are in the environment. All Project Managers have signed off.	K. Meinen	4/3/09; complete, to be verified by Utilicast
UTIL09-09	Review access policies and IT controls for non-production environments.	4/15/09 Release Management process was published to SharePoint, last week, with email explaining it. Meetings are set for 4/16 and 4/20 to discuss release management and infrastructure change processes with those doing integration testing	K. Meinen	3/31/09; revised to 4/30/09; complete, to be verified by Utilicast

Nodal Testing Environments Software Migration

Nodal Testing Phases [not to scale for duration or effort!]

Phases

Development Testing (unit, module, system)	Pre-FAT Testing	Functional Acceptance Testing (FAT)	Integration Testing Adapter Testing Interface Testing	End to End Testing	Market Trials Testing

Environments

Development (development site)	Dev	FAT	iTest	EDS

Performers

Development Team (Vendor or ERCOT, depending on system)

Nodal Project Teams	Nodal Project Teams, with support from EIP	Business SMEs	MPs and Market Trials Team
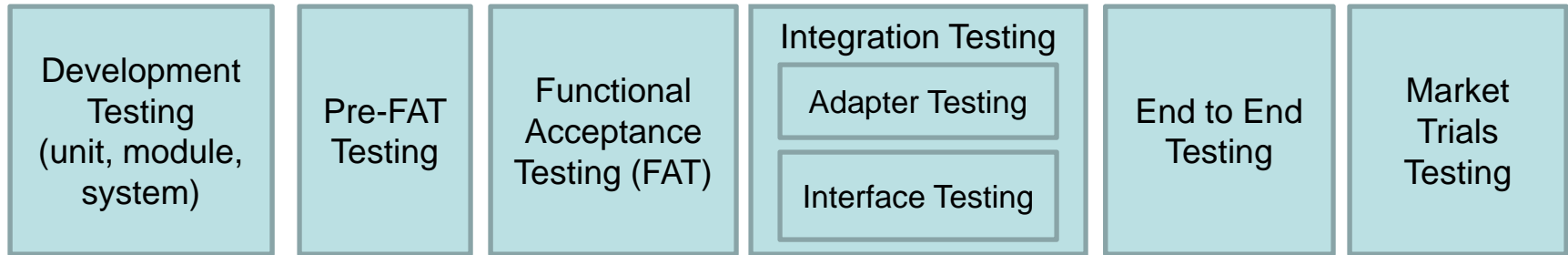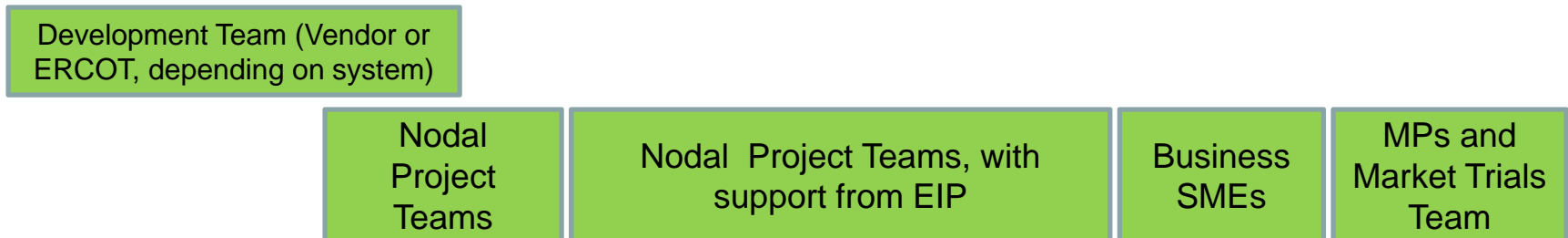
DEV → FAT → Integration → End-to-End Testing → Market Trials
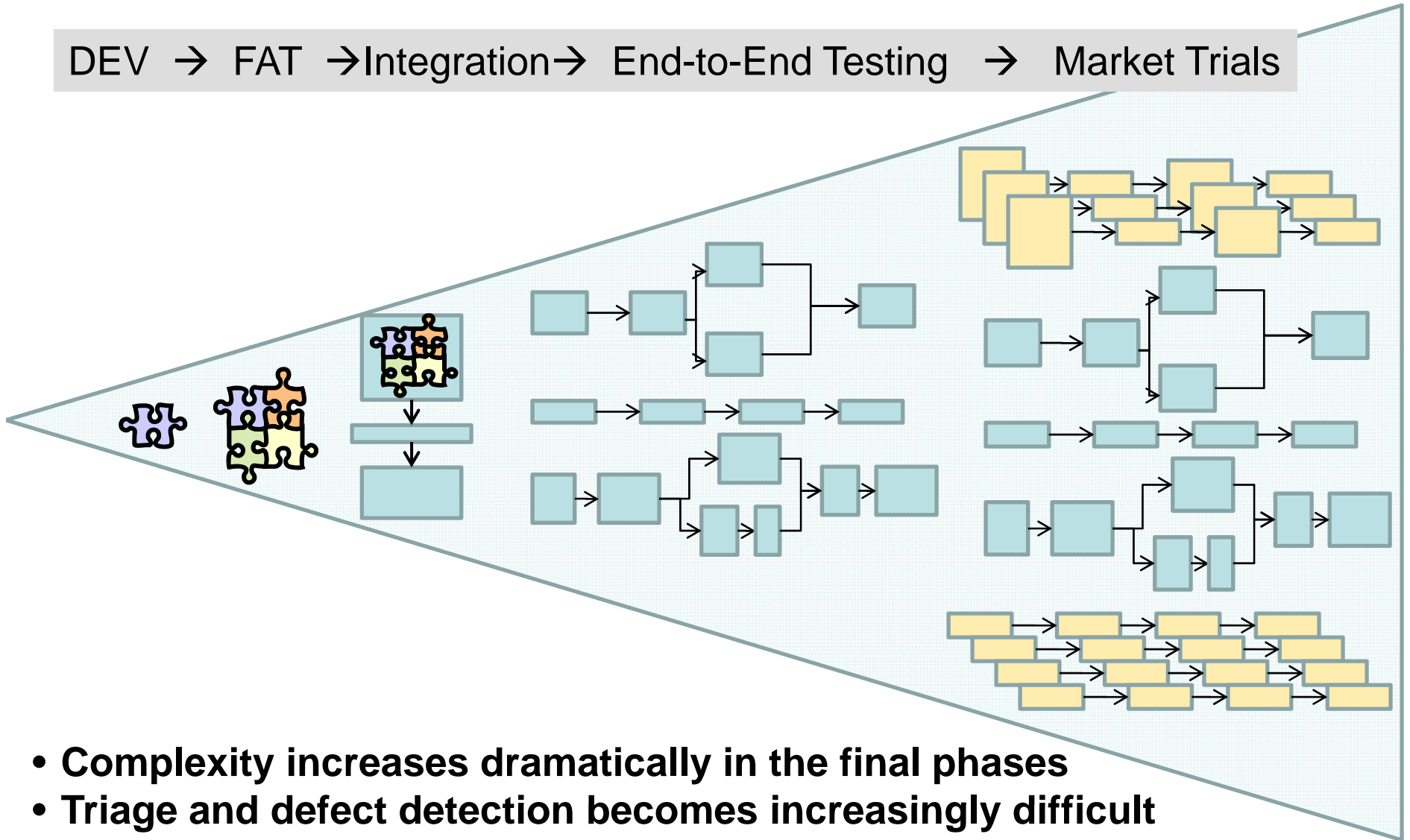
- **Complexity increases dramatically in the final phases**
- **Triage and defect detection becomes increasingly difficult**

Characteristics of Nodal Software

- **Software is from multiple vendors, not a single suite**
- **Releases from each vendor arrive asynchronously and are put into test environments as soon as possible, not bundled into a single nodal release**
- **Release Management process helps optimize the flow of software updates**
  - Maximize testing time in the test environment; minimize disruption
  - Optimize flow of changes into a test environment
    - Update at the same time multiple systems that have been repaired to correct a defect
    - Validate first (individually, together) in project test environments
    - Insert updates to multiple systems whose timing coincides
    - Maintain an awareness of the current state of each environment and the updates in queue
    - Negotiate best update strategy with teams affected

Release Management Process Flow for Nodal Integration Test Phase (April 1, 2009)

Vendor/ERCOT Dev (Nodal Project Teams)
- Code & Unit Test
- Provide Dev Deliverables (MCR or MMCR, Unit Test Doc, and other attachments)
- Create package line(s) in PPM Tool
- Complete

Release Mgmt Coordinator
- Review Deliverables and coordinate review by deploy teams
- RC Approve?
- Is this an MMCR?
- Verify deployment date, time, readiness
- Release into next environment?

Configuration Manager
- Move code into ClearCase Repository & perform build (if RM builds)
- Move (and if appropriate, build) successful?
- CM approves package lines?

Deploy Teams (Production Support)
- Deploy software via PPM Tool or Manually
- Successful?
- Smoke Test
- Successful?
- Environment Issue?
- Fix
- Is this an MMCR?

Test Team (Nodal Project Teams)
- Perform Testing
- Successful
- Provide Test Deliverables (Test Scripts/Sign Off & Testing Czarina Sign Off)

Assumptions:
1. Initial deployment in workflow is into a RM controlled test environment.
2. Rollbacks are not required.
3. Deployments follow the normal progression path.
4. All changes are routine (no emergency changes).
5. MCR or MMCR can be cancelled at any point.

Updating Test Environment Elements – Key Segments

Requested via

Processed via

MCR/ MMCR

- Database Content or schema changes
- Application A
- Application B
- Application …
- Interface SW (TIBCO, EDW, CDR)

(Software) Release Mgt process

TA Doc update – may require 2 systems for transition period

- Platform SW (OS, browser, DBMS, …) updates

CRQ – specific Remedy workflow

TA Doc high level, Storage Req. on SP site w/details detail

- Storage capacity / refresh

CRQ – specific Remedy workflow

TA Doc update; Node to Node Request on SP site

- Network connections of systems

Intranet tracking; not yet in Remedy

TA Doc update

- Hardware – servers, blades, …

CRQ – specific Remedy workflow

Intranet: Employee Access request by ERCOT supervisor

- Access to systems, DB, apps, drives, etc.

By hand; project automates some with Sun IDM -2009

DCR

- Database script changes for backup, monitoring; patches

OCR – DB patch procedure, by hand

Helpdesk ticket

- Memory upgrade for server, additional CPUs for VM or server, some other

Incident (INC) Remedy workflow; ends with check to update TA doc