



Texas Nodal Market Implementation  
Program Update

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**Monthly Board of Directors Meeting**  
**April 15, 2008**

- **Program Status** ..... **Unchanged; Amber Status**
- **Quality** ..... **Under control; (follow-up metrics to be discussed from March BoD meeting)**
- **Risk**..... **Integration risk is still high**
- **Schedule** ..... **Dec 1 is the go-live date, w/ less than 20 weeks till 168 (24 x 7) Hour Test**
- **Cost**..... **Under budget to date; Forecast unchanged; \$3.4 M of Contingency earmarked**

$$\text{Nodal Delivery} \times \text{ERCOT Readiness} \times \text{Market Participant Readiness} = \text{Nodal Success}$$

**ERCOT Readiness status is:**

Amber

Expected trend is acceptable, but staffing levels and procedures need improvement

**Market Participant Readiness status is:**

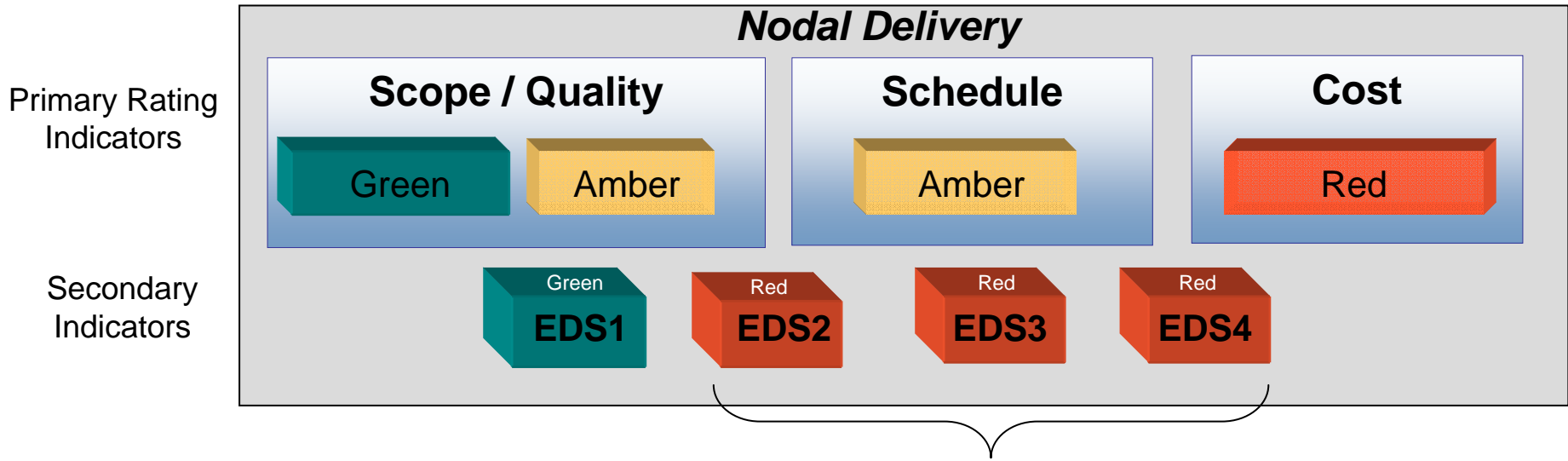
Amber

Projected to go RED for many MPs due to insufficient training and readiness

**Nodal Delivery status remains:**

Amber

Most indicators will start improving. See details on later slides



To be discussed on later slides



**Nodal Delivery status remains *amber*; health checks in process**

**Nodal Delivery**

### Scope / Quality

Green \*

Amber

- Aligned with protocols
- Achieving quality standards to date; upcoming months will be telling
- \* TPTF is addressing issue where MPs not in complete agreement, e.g., self-committed resources in DAM.
- Applying increased efforts to identify and resolve defects in pre-FAT and FAT

### Schedule

Amber

- Checkpoints in place to ensure ongoing viability of 12/1/2008
- EDS 2, 3, 4 still red (ACE testing and Alarm Processing) These are expected to turn green when EMS delivers final software release.

### Cost

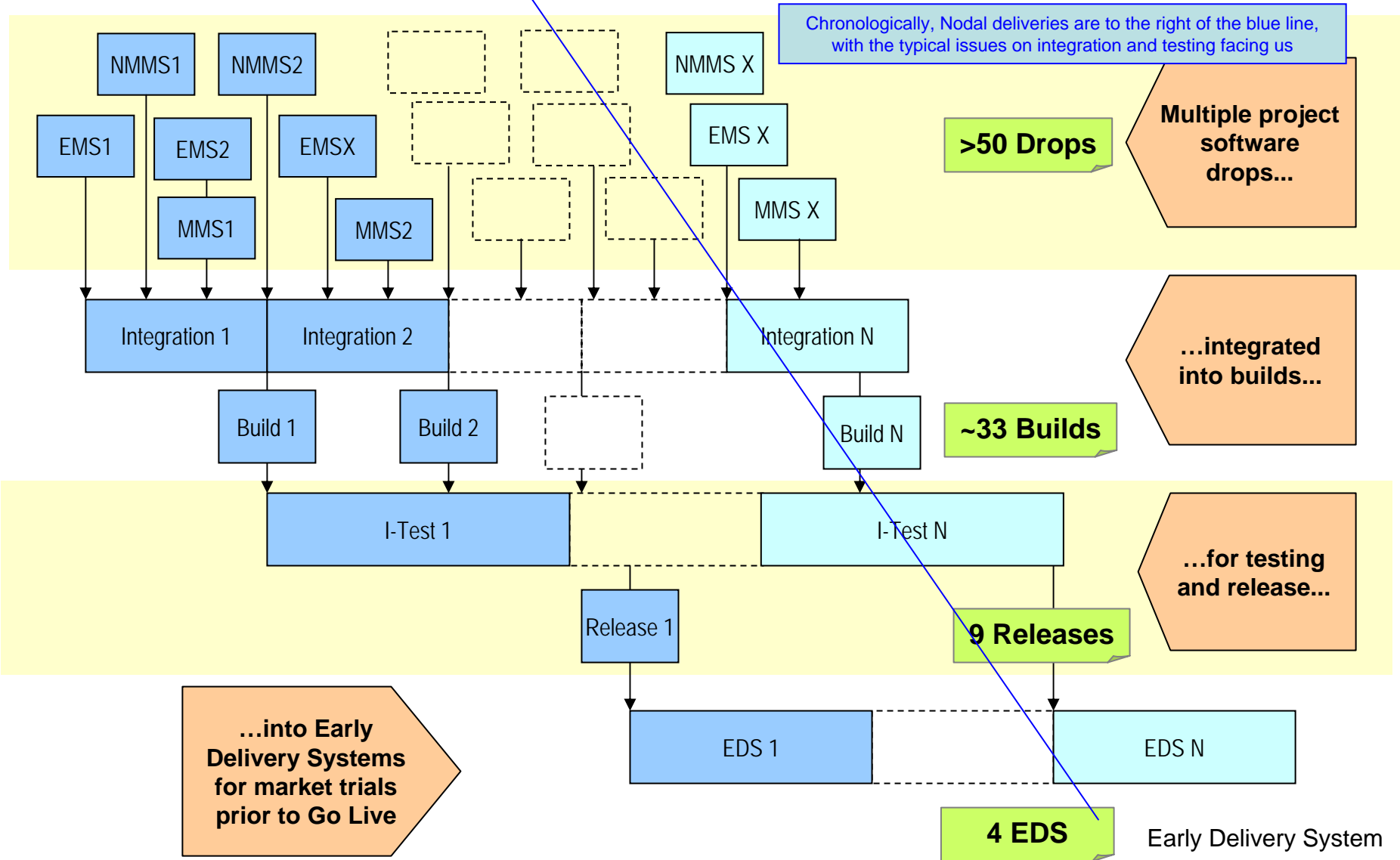
Red

- Pending PUCT approval of Budget
- Fee request filed w/ PUC on 6 Mar 08

**Legend**

|       |   |  |                     |   |
|-------|---|--|---------------------|---|
| Red   | Program is not aligned to protocols             | Current product quality is not sufficient for Nodal launch | Go-live = >30 days+ | Estimate at Complete = >\$319.5m + 10%  |
| Amber | Program is aligned to previous protocol version | Most Nodal products currently achieve quality standards    | Go-live = <30 days+ | Estimate at Complete = < \$319.5m + 10% |
| Green | Program is aligned with current protocols       | All Nodal products currently achieve quality standards     | Go-live = 12/1/08   | Estimate at Complete = <\$319.5m        |

Critical path – Nodal software is now into final (9<sup>th</sup>) release, and final (4<sup>th</sup>) EDS. Most of the “houses” are built, and many of the “pipes” have been laid.

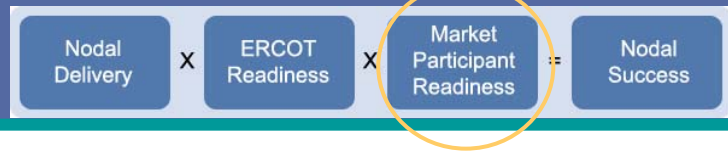




## **ERCOT Readiness status is *amber***

Background info only, we are not planning to discuss

- ERCOT Readiness Survey to move to monthly updates
- Transition plans recently developed (Feb. 29) and scheduled for updates in April and June
- Business Process model was completed and provides a top-down view and low-level operational detail
- Procedures being developed for each department based on Business Process model; Procedure scorecard in development and available at end of April
- Steady progress on training
- Staffing plans developed; recruiting ongoing; timeframes established



**Market Participant Readiness** status remains **amber**

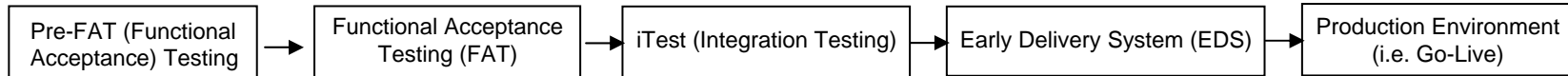
Background info only, we are not planning to discuss

- *Engagement [Amber]* – Still remains an area of concern. Expected to worsen before it gets better.
  - Market Participant survey (third round) closed March 31. Many are stating they are RED but discussions and verifications are being made during April.
    - Results available mid-April.
- *Registration and Qualification [green]*
- *Connectivity and Telemetry [green]* – Connectivity metrics complete for most MPs. Outliers are new to the program and need to go through EDS process
- *Training [green]* – Training metrics are expected to turn RED soon.
- *Trials Participation [green]* – Actively measuring EDS3 and EDS4 trial participation metrics
- Looking ahead
  - Readiness Metric for Resource Entity review of Resources to Resource Nodes and Resources to EPS Meters (MP10) is due by April 15, 2008.
  - Numerous metric milestones are upcoming in next two months. “Hall of Fame” scorecard and “Wall of Shame” metrics are prime motivators
  - See [www.nodal.ercot.com](http://www.nodal.ercot.com) for schedule of upcoming metrics

## ***Regression testing is employed to ensure that new code fixes do not adversely affect other code functionality***

This information was requested at the March BoD meeting for discussion in April

- **Testing is conducted continuously through all phases of software development**



*Software Testing Phases*

- **Testing steps include the following:**

- 1) Defects are detected (may be detected during any test phase)
- 2) Defect is fixed
- 3) Fix is verified
- 4) Balance of code is subject to *regression testing*

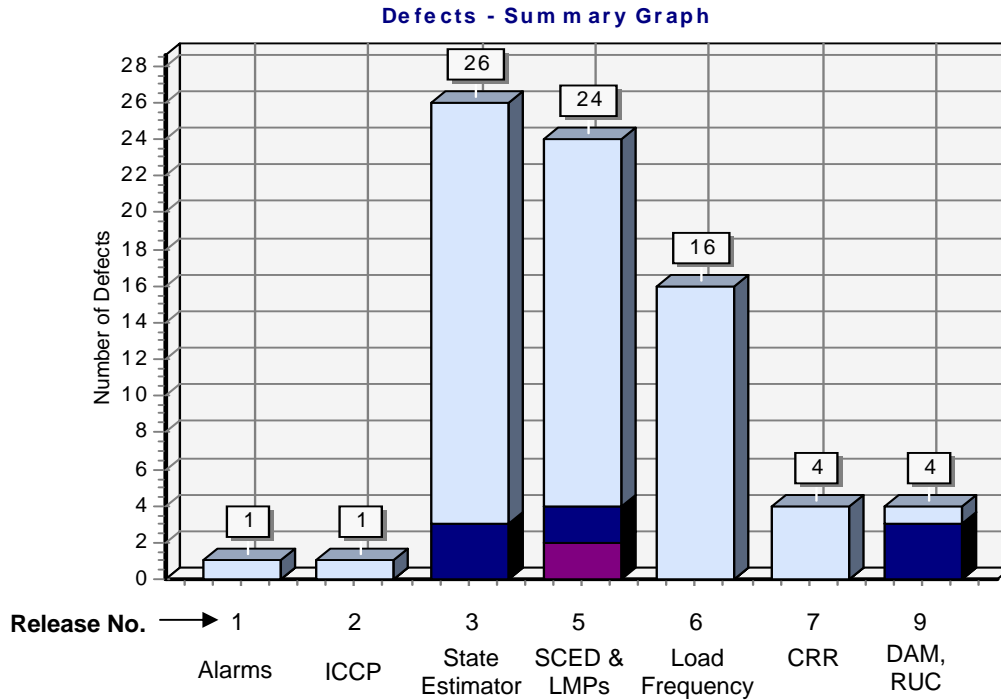
- ***Regression testing* ensures key functionality is maintained after a fix; criticality of regression testing increases as code migrates through test phases**

- 1) Identify key functionality to be tested
- 2) Execute specialized test suite
- 3) If key functionality is affected, fix code, retest, and iterate until functionality is maintained



## EDS active critical (Severity 1 and 2) defects are concentrated in Releases 3, 5, and 9\*

This information was requested at the March BoD meeting for discussion in April



- 1 Data Loss/Critical Error
- 2 Loss of functionality w/o w o..
- 3 Loss of functionality with w ..

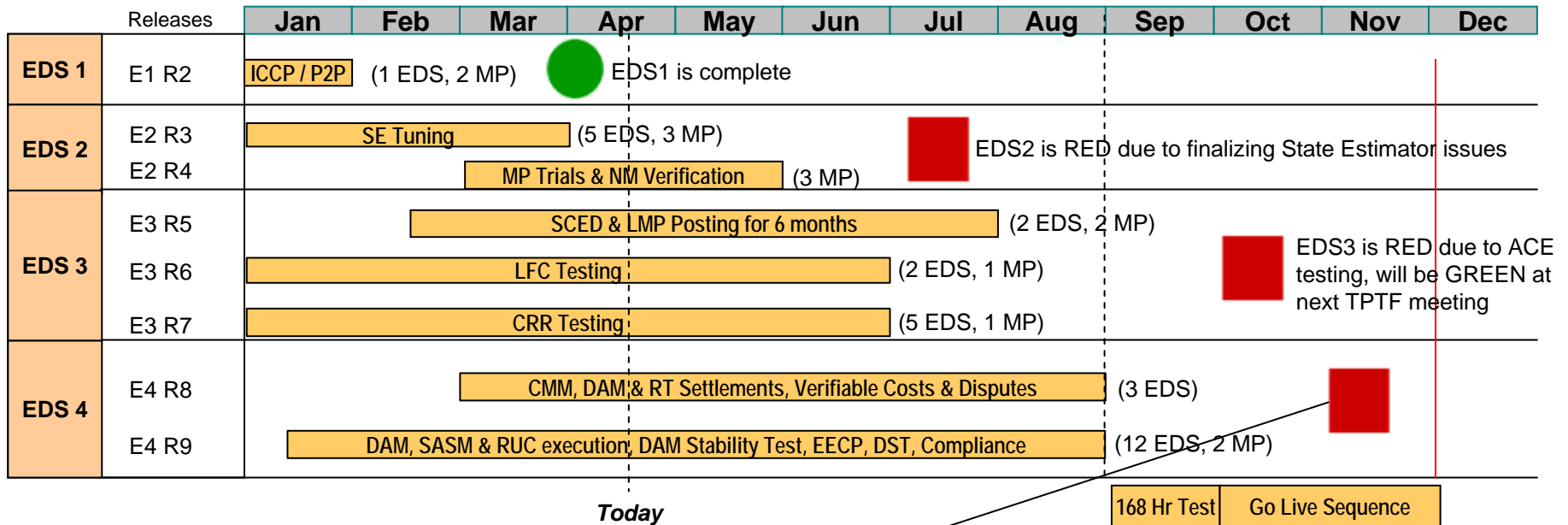
- ❑ Current testing in EDS represents approximately 25 - 30% of code to be tested in EDS
- ❑ The number of defects associated with remaining EDS testing is expected to increase significantly due to the increasing complexity associated with systems' integration
- ❑ Timely fixes to the currently unknown number of defects in the code remaining to be tested in EDS represents a major project challenge.

Notes: 1) Data only includes defects identified in EDS testing (i.e. defects that migrated into EDS from FAT are excluded)  
 2) Data does not include closed or deferred defects  
 3) Release 8 (Credit, Settlement and Billing) not yet in EDS; no EDS identified defects in Release 4 (NMMS)

\* State Estimator (SE) tuning, Security Constrained Economic Dispatch (SCED) and Locational Marginal Price (LMP) posting, and Day Ahead Market (DAM), et al. respectively

# Schedule: Metric status for each of the Early Delivery Systems

## No change\* in EDS status since last meeting



(xx) – Number of metrics associated with a particular Release

Overall Readiness (15 metrics):



**EDS4** – Mostly unmeasured at this point, but inheriting Red status from recently moved Alarms Processing metric (from EDS1). Commercial Ops metrics being measured are Green

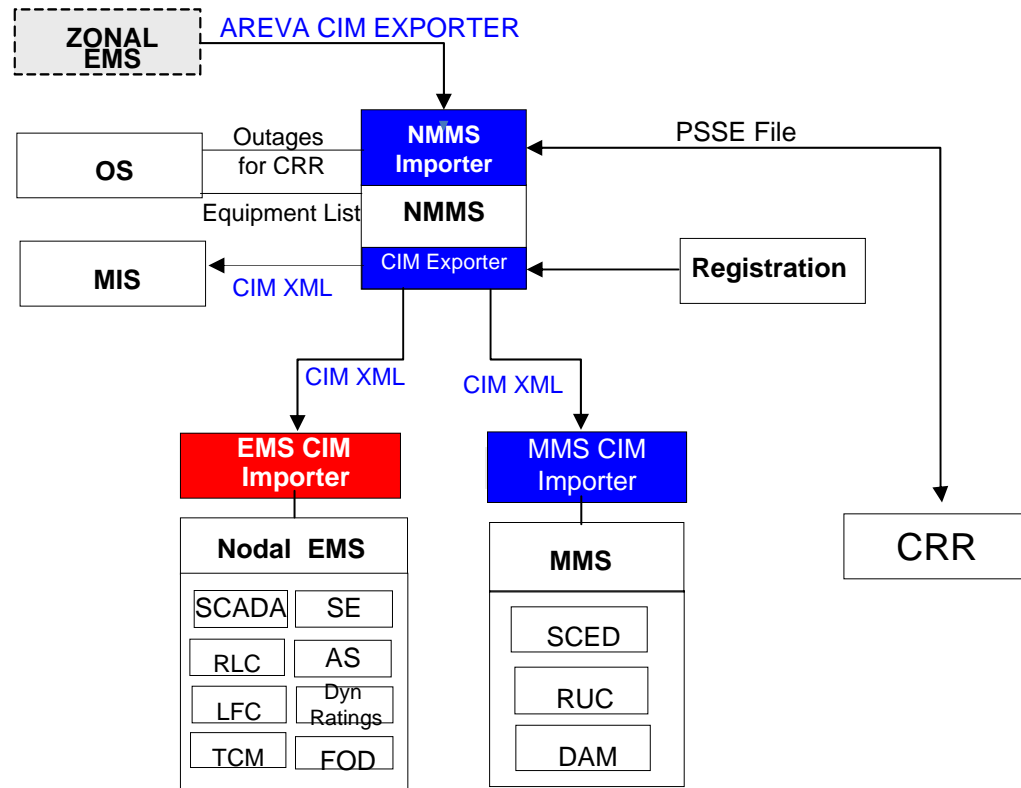
**Overall Readiness** – Amber due to open issues on telemetry, modeling, and CIM. The Common Information Model is expected to be delivered complete on May 2. A Working CIM on May 2 is the major concern of Nodal Delivery.

<http://scorecard.ercot.com>

\* As of 7 April 08

- **CIM Health check is currently in process and will be reported to TPTF at end of April**
- **Focus of health check will be on the NMMS, MMS, and EMS, systems**
- **Further evaluation will be upon process to date, and data issues**
- **Largest known risk is the EMS CIM importer delivery date, and ERCOT has escalated the issue to vendor's executive management. Key delivery expected on May 2.**

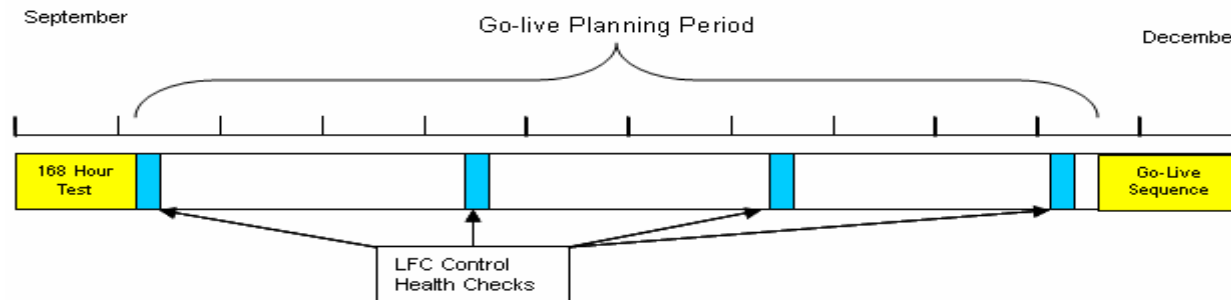
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# Go-Live Plan: Will encompass key activities/actions post the successful completion of the 168-Hr test

## Key Elements of the plan include:

- ERCOT and Market Participant engagement expectations
- Communications and ongoing health checks during the go-live period
- Phased Staging of production submission during cut-over
- Planned regression test of Nodal LFC
- Software environment controls (migration freeze)
- Contingency planning and guidelines for switch control back to zonal



| Next Steps               | Target Completion Date |
|--------------------------|------------------------|
| Complete ERCOT review    | April 11 <sup>th</sup> |
| Present to TPTF for Vote | May 5 <sup>th</sup>    |
| Present to TAC for Vote  | June 5 <sup>th</sup>   |
| Present to BoD           | June 17 <sup>th</sup>  |

- EAC Revised Budget and Forecast remain constant***

**Nodal Program  
Cost Element Summary**  
(\$ Millions)

| <u>Cost Element</u> | <u>Through February 2008</u> |               |                          | <u>Estimate at Complete (EAC)</u> |                 |                          |
|---------------------|------------------------------|---------------|--------------------------|-----------------------------------|-----------------|--------------------------|
|                     | <u>Revised Budget</u>        | <u>Actual</u> | <u>Var. (o)/u Budget</u> | <u>Revised Budget</u>             | <u>Forecast</u> | <u>Var. (o)/u Budget</u> |
| Internal Labor      | \$ 29.0                      | \$ 29.2       | \$ (0.2)                 | \$ 47.9                           | \$ 48.1         | \$ (0.2)                 |
| External Labor      | 67.1                         | 61.0          | 6.1                      | 94.9                              | 95.6            | (0.7)                    |
| Vendor              | 50.5                         | 49.8          | 0.7                      | 76.8                              | 79.2            | (2.4)                    |
| Hardware / Software | 56.9                         | 57.1          | (0.2)                    | 59.2                              | 59.3            | (0.1)                    |
| Taxes and Other     | 10.7                         | 11.0          | (0.3)                    | 15.1                              | 15.1            | -                        |
| Subtotal            | \$ 214.2                     | \$ 208.1      | \$ 6.1                   | \$ 293.9                          | \$ 297.3        | \$ (3.4)                 |
| Contingency         | -                            | -             | -                        | 15.0                              | 11.6            | 3.4                      |
| Total Nodal Program | \$ 214.2                     | \$ 208.1      | \$ 6.1                   | \$ 308.9                          | \$ 308.9        | \$ -                     |
| Finance Charge      | 7.3                          | 7.5           | (0.2)                    | 10.6                              | 10.6            | -                        |
| Total               | \$ 221.5                     | \$ 215.6      | \$ 5.9                   | \$ 319.5                          | \$ 319.5        | \$ -                     |

## Nodal Program Project Summary

(\$ Millions)

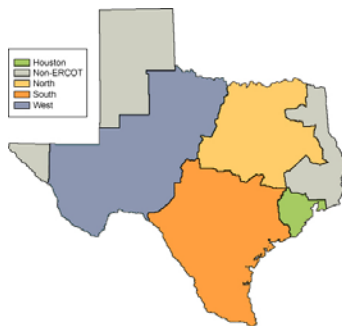
| Project Name                         | Through February 2008 |          |                   | Estimate at Complete (EAC) |          |                   |
|--------------------------------------|-----------------------|----------|-------------------|----------------------------|----------|-------------------|
|                                      | Revised Budget        | Actual   | Var. (o)/u Budget | Revised Budget             | Forecast | Var. (o)/u Budget |
| Commercial Systems (COMS)            | \$ 12.6               | \$ 13.2  | \$ (0.6)          | \$ 17.3                    | \$ 17.3  | \$ -              |
| Congestion Revenue Rights (CRR)      | 7.2                   | 7.0      | 0.2               | 8.1                        | 8.1      | -                 |
| Early Delivery System (EDS)          | 9.0                   | 8.0      | 1.0               | 21.2                       | 21.2     | -                 |
| Electronic Data Warehouse (EDW)      | 2.2                   | 2.2      | -                 | 4.1                        | 4.1      | -                 |
| Enterprise Integration Project (EIP) | 15.0                  | 14.9     | 0.1               | 20.0                       | 22.0     | (2.0)             |
| Energy Management System (EMS)       | 17.2                  | 15.5     | 1.7               | 21.5                       | 21.5     | -                 |
| ERCOT Readiness & Transition (ERT)   | 2.0                   | 1.6      | 0.4               | 4.0                        | 4.0      | -                 |
| Integrated Design Authority (IDA)    | 7.7                   | 7.6      | 0.1               | 9.7                        | 9.7      | -                 |
| Infrastructure (INF)                 | 63.5                  | 63.2     | 0.3               | 66.5                       | 67.0     | (0.5)             |
| Integration Testing (INT)            | 15.3                  | 15.1     | 0.2               | 19.7                       | 20.6     | (0.9)             |
| Market Information System (MER-MIS)  | 6.1                   | 5.7      | 0.4               | 9.3                        | 9.3      | -                 |
| Market Other (MER-OTH)               | 3.3                   | 3.0      | 0.3               | 5.1                        | 5.1      | -                 |
| Market Training (MER-TRN)            | 5.6                   | 5.3      | 0.3               | 9.1                        | 9.1      | -                 |
| Market Management System (MMS)       | 31.7                  | 29.9     | 1.8               | 52.1                       | 52.1     | -                 |
| Network Model Mgmt System (NMMS)     | 8.3                   | 8.1      | 0.2               | 14.6                       | 14.6     | -                 |
| Program Control (PC)                 | 7.5                   | 7.8      | (0.3)             | 11.6                       | 11.6     | -                 |
| Subtotal                             | \$ 214.2              | \$ 208.1 | \$ 6.1            | \$ 293.9                   | \$ 297.3 | \$ (3.4)          |
| Contingency                          | -                     | -        | -                 | 15.0                       | 11.6     | 3.4               |
| Finance Charges                      | 7.3                   | 7.5      | (0.2)             | 10.6                       | 10.6     | -                 |
| Total                                | \$ 221.5              | \$ 215.6 | \$ 5.9            | \$ 319.5                   | \$ 319.5 | \$ -              |

## Cost: Additional funding to be requested at May / June BoD meetings\*

| Project                           | Vendor             | BoD Month | Comments  |
|-----------------------------------|--------------------|-----------|---|
| Integration                       | UISOL / Perficient | May 08    | Delay in project deliveries since December                              |
| Commercial Systems                | Rome               | May 08    | Settlement issues extending to 168 hour test (final downstream project) |
| Network Model                     | Siemens            | May 08    | Higher Baseline 2 items   |
| Congestion Revenue Rights         | Nexant             | May 08    | Sev 1 and 2 defect resolution   |
| Program Control / project support | PA Consulting      | June 08   | Add'l PMO and Delivery Assurance effort                                 |

\* Funding is either included in the revised budget or included in contingency allowance.

# Questions ??



ERCOT Nodal Market Transition

