

**TECHNICAL ADVISORY COMMITTEE  
TO TEXNET AND BUREAU OF ECONOMIC GEOLOGY**

**Meeting Minutes**

Wednesday, July 12, 2023 – 11:00am to 3:00pm

**OPENING**

The meeting of the TexNet Technical Advisory Committee was called to order at ~11:00am on Wednesday July 12, 2023.

**PRESENT**

Alexandros Savvaadis, Manager of TexNet  
Brian Stump, Committee Chair  
Jeff Nunn, Committee Member  
Kris Nygaard, Committee Member  
Scott Mitchell, Committee Member  
Chris Hillman, Committee Member  
Mark Boyd, Committee Member  
Scott Tinker, Director, BEG (via Teams)

**ABSENT**

Aaron Velasco, Committee Member  
Dave Cannon, Committee Member

**AGENDA FOR JULY 12 MEETING**

1. Approval of Minutes of the March 20<sup>th</sup>, 2023 (2023Q1) meeting.
2. In person introduction of TexNet team (1hr with lunch)
3. Budget Review – Update on the Hiring Plan (30min)
4. Operations status and plan (30min)
5. Publications and presentations update (30min)
6. Peer Review Update (FocMec - Depth Uncertainty – 30min)
7. Discussion of TexNet-TAC and CISR-SAC relationship from BEG perspective (30min)
8. TexNet TAC suggestions for the subsequent meetings (30 min)

**APPROVAL OF MARCH 29, 2023, MINUTES**

The Committee approved the meeting minutes from March 29, 2023.

**ORGANIZATION**

The current staffing of the TexNet organization was reviewed with the TAC, and the TAC was introduced to the TexNet staff in attendance for introductions and lunch discussions. The organization review highlighted that the TexNet organization is managed by Alexandros Savvaadis, and that the current organization structure provides for 3 teams, comprised of a Field Operations Team, Seismic Analysis Team, and an IT Team. The job opening for the IT Team Lead position has been posted and remains to be filled; Vincent O'Sullivan is the designated Field Operations Team Lead, and Daniel Siervo is the designated Seismic Analyst Team Lead. The hiring outlook is to staff TexNet with 9 full time employees. It was discussed that the new hires undergo on-boarding and training programs, and it was highlighted that the "Slack Software Tool" has been very helpful for cataloging and logging information and activities so data and information can be quickly and transparently shared and accessed across the teams.

During the Organization discussion, the TAC had a broad discussion on the reliability of sensors and monitoring systems and expected maintenance requirements. The TexNet staff highlighted that the main maintenance concerns surround

battery replacements of the remote monitoring systems, highlighting that each station needs replacement of 2 batteries approximately every 12-15 months, such that ~320 batteries need to be planned for replacement across the ~160 stations each year.

The TAC also held broad discussion on current data storage and systems to provide for redundant data backup. It was discussed whether current budgets provide for ensuring sufficient data storage capacity will be available to meet the growing data volume; it was highlighted that funding will be allocated so that data storage capacity will be sufficient for the forward looking for ~5 years. The data is currently stored on BEG servers as well as an offsite backup server. It was discussed that "Cloud" storage solutions for the full data archive appear to cost ~3 – 4 times as much as the current cost of server storage.

The TAC suggested that it may be prudent to set clear objectives and goals for IT data storage forward looking needs and define the metrics and funding allocations for a longer term forecast of data storage needs, so that this can be better defined and included in forward looking budget forecasts.

**ACTION: TexNet consider this recommendation and include in annual / biennial budget forecasts.**

During the organizational discussion, it was discussed whether the current outlook for the increased staffing levels would allow reporting of magnitude M1.5 events within a 1 day turn-around time and M3.0 events within 20-minutes, and it was suggested that it was likely this goal could be achieved within 1 month of achieving full staffing levels. The TAC emphasized the desire and importance of achieving M1.5 event timely reporting, and emphasized that this should be the primary goal and emphasis as staffing is increased. The TAC also suggested it would be desirable to release "auto-locations" as soon as possible and flag these events as "auto / preliminary" to reflect that these events have not been manually verified.

**ACTION: TexNet consider this recommendation and place highest priority for achieving the targeted M1.5 reporting timeframe.**

## **BUDGET**

The updated budget was reviewed with the TAC. It was highlighted that the budget increase was successfully obtained and now provides for \$3,032,000 annually. This budget allocation begins September 1, 2023 at the start of the fiscal year, and it is expected that the monies would be received by October 2023.

It was discussed that the budget allows for the planned 9 FTE staffing recruits and all job postings should be posted in September. The Earthscope platform will be used for job postings to target a larger breadth of potential job applicants.

## **SEISMIC STATIONS / OPERATIONS UPDATE**

It was discussed that 2 new monitoring stations were deployed in 2Q 2023 with funding contributions made by Oil & Gas operators with one new station added in the Midland Basin and a new station added in the Delaware Basin. It was highlighted that two new stations are also planned to be added at some point in 3Q 2023.

It was highlighted that most of the seismicity is in the North Texas Delaware Basin considering both seismicity rate and highest magnitude; and that seismicity seems to have increased at the eastern shelf and central-south part of Midland Basin. It was further noted that South Texas Delaware Basin, Midland Basin and Eagle Ford have a fairly stable pattern of seismicity. The TexNet team also discussed that they are testing "Machine Learning" techniques and algorithms for possible approaches to detect seismicity in three regions of the Permian Basin.

## **UPCOMING PUBLICATIONS AND PRESENTATIONS**

A listing of recently published manuscripts was presented that listed 3 publications focused on event detection and improved / novel computational algorithm. It was also discussed that 3 additional manuscripts are currently under peer review. Three presentations have also been made in 2023 and the topics of these presentations were briefly discussed.

## **EXTERNAL PEER REVIEW UPDATE**

It was discussed that there are 2 major areas of focus that would be beneficial to make progress on in advance of the next external peer review: (1) the ability and capabilities to provide focal mechanisms of small magnitude events and analyze and report event uncertainty information; and (2) how depth uncertainty is being analyzed and considered. The TexNet team highlighted their plan was to compare different methods to calculate focal mechanisms, and that they were exploring various full waveform inversion methods. To address depth uncertainty, the TexNet team plans to create accurate 3D velocity models and use Lomax and Savvaidis (2019) approach to calculate absolute depth uncertainty.

The TAC recommended that the External Peer Review should be convened once progress has been made on the above two focus areas. It was suggested that this should be considered and scheduled with sufficient advance notice considering the desire to have similar broad expertise participate in this peer review. It was also requested that the TAC receive the previous comprehensive External Peer Review Reports for review in advance of the next meeting.

## **DISCUSSION OF TEXNET TAC & CISR RELATIONSHIP**

The TAC discussed the importance of keeping clear boundaries and distinctly separate relationships between TexNet and CISR, considering specifically that state-funds provide for TexNet operations and CISR industry-funding should be used for CISR related projects. Given that research efforts may benefit both entities, the TAC felt it was important to discuss the importance of BEG maintaining separate and distinctly different projects and project funding and tracking between TexNet and CISR.

The TAC discussed the benefits of the information sharing that occurs in the annual December meetings with CISR; and also highlighted that TAC participation must consider and apply State of Texas Open Meetings and Open Records requirements. The TAC discussed the need that this issue be considered in planning for the December 2023 annual meeting.

The TAC discussed how TexNet organization (State-funded) and the CISR organization (Industry-funded) distinguish work and publications from each other. It was discussed that CISR primarily focuses on causal analysis and fluid flow / reservoir / geomechanical modeling, while the TexNet is primarily focused on network operations, event detection/location and cataloguing of seismic events, statistical and physics-based triggering of seismicity and earthquake hazard/risk assessment.

The TAC recommended that the research goals of both TexNet and CISR be clearly developed and provided in written framing documents so that all stakeholders can clearly understand and articulate the distinct and separate focus of each entity. During this discussion, the TAC highlighted the view that the TAC and TexNet are not part of CISR but can work with and collaborate with CISR to advance the common understanding. The TAC further emphasized the two most important questions (and goals to obtain understanding of) for TexNet monitoring are: (1) What is happening?; and (2) Are we safe?. The TAC suggested that the previous TexNet Mission Statement be reviewed and revisited at the next TAC meeting to see if any upgrades or revisions should be further considered.

## **SUGGESTED TOPIC FOR NEXT MEETING**

The following items were identified for discussion at the October 17, 2023, TAC Meeting.

### ***Key Topics***

- 1 Status of the Hiring Plan (describe what the new people will do) (30min)*
- 2 Review goals and objectives*
- 3 Progress on the TexNet metrics (reporting automatic events for the M1.5 threshold)*

### ***Additional Updates***

- Operations (eq status/maintenance, resources) (30min)*
- Publications and presentations update (30min)*

- *Research presentation (1hr)*
- *Peer Review Update (FocMec -Depth Uncertainty –30min)*
- Suggestions for the subsequent meetings (30min)

## **ADJOURNMENT**

Meeting was adjourned at ~3:00pm by Brian Stump, Committee Chair

**Minutes submitted by:** Kris Nygaard, TexNet TAC Member

**Minutes approved on December 6<sup>th</sup>, 2023, by:**

Alexandros Savvaidis, Manager of TexNet

Brian Stump, Committee Chair

Mark Boyd, Committee Member

Dave Cannon, Committee Member

Chris Hillman, Committee Member

Jeff Nunn, Committee Member

Kris Nygaard, Committee Member (via Teams)

Aaron Velasco, Committee Member