



NEES Consortium, Inc.

George E. Brown, Jr. Network for Earthquake Engineering Simulation

Report from the Meeting of the IT Strategy Committee
11-12 December 2005
Radisson Hotel
La Jolla, CA

Present:

ITSC Voting Members

Jacobo Bielak (Chair)
Jason Hanley
Cherri Pancake
Shannon Whitmore

Peter Couvares
Anke Kamrath for Van Den Einde
Sri Sritharan
Dan Wilson

Jerome Hajjar (Chair Elect)
Laura Lowes
Christopher Stanton

ITSC Ex Officio Members

Cliff Roblee (NEESinc)
Lorraine Hwang (NEESinc)

Guests

Adam Birnbaum (NEESit)
John Lea (guest of NEESinc, *Monday*)
Bernard Minster (IGPP/SCEC, *Tuesday midday*)
Lelli Van Den Einde (NEESit, *Monday*)

Absent:

ITSC Voting Members

Manuel Vigil

ITSC Ex Officio Members

John Bobbitt (Board Liaison)
Andrei Reinhorn (Board Liaison)

Executive Sessions:

The ITSC held an executive session to discuss views pertaining to NEESit and subawardee performance, budget and proposed work plans. Lorraine Hwang, NEESit staff, and all guests were recused from this portion of the meeting. In addition, Cherri Pancake was recused for that portion of the executive session that pertained to discussion of the OSU/NACSE subaward.

Presentations:

The following NEESit/NEESinc presentations are located in NEEScentral. (<http://central.nees.org>)

- NEES ITSC Dec Meeting.ppt, Kamrath, Hwang, Whitmore, Birnbaum
- IT Decisions.ppt, Roblee

Recommendations to the Board

The following recommendations are intended for consideration by the NEESinc Board of Directors at their Winter meeting to be held on February 3-4, 2006. This meeting will focus on IT issues.

1) Change in NEESit Scope of Work – Adopt ‘DataPlus’ Alternative & Revise Priorities

- NEESit presented four FY06 work plan alternatives for ITSC consideration that illustrated a range of potential move-ahead strategies possible within the current budget. The ITSC reviewed the work plan alternatives and recommend that “DataPlus” be adopted. DataPlus clearly places highest emphasis, but not all resources, squarely on the tasks needed to implement a comprehensive end-to-end data flow process (data gathering to

public archive) for experimental research data. The ITSC recognizes that DataPlus will require that some areas identified in the current NEESit scope of work be delayed temporarily. This was found to be a required compromise in order to realistically achieve the complete NEES data vision in a timely manner.

2) Adoption of Case Study Projects and User Data Models

- For purposes of implementing the global data model, ITSC recommends that at least two specific NEES experimental case study projects be selected as pilot test projects. These case studies are to facilitate and help guide the development of IT tools for data organization and telepresence by NEESit under DataPlus and to ensure that the resulting tools and processes are well aligned to engineering research user requirements. The ITSC specifically recommends that NEESit be directed to interact closely with the case study projects personnel to produce the most appropriate IT tools to carry out the necessary data organization and telepresence tasks in the respective projects. These activities will require that the Case-Study Project PI and other personnel agree to this concept and participate actively with NEESit.

The ITSC recommends that the following high priority Use Case Scenarios from among those proposed in the *NEESit Use Case Analysis*¹ be fleshed out and implementation be completed in FY06:

Use Case Scenario	Case-Study Projects	
4.2 Data Organization (all sections) 4.2.1 Organize Data 4.2.2 Structure Data 4.2.3 Encapsulate Data 4.2.4 Curate Data 4.2.5 Publish Experiment 4.2.6 Add Analysis	Project: 0324326 (pre-NEESR)	
	PI: Sharon Wood, Texas	
	Title: Demonstration of NEES for Studying Soil-Foundation-Structure Interaction	
	Equip. Site	Contacts
	UC-Davis	Kutter, Wilson
5.2 Telepresence Scenarios (selected sections) 5.2.2 Participate in Experiment 5.2.4 Review Historical Data	UN-Reno	
	Saidi, Buckle	
	UT-Austin	
	Stokoe, Rathje	
	Project: 0421577	
	PI: Laura Lowes, U. Washington	
	Title: Seismic Behavior, Analysis and Design of Complex Wall Systems	
Equip. Site	Contacts	
UIUC	Hajjar, Kuchma	
	Project: 0324504	
	PI: Cathy French, U. Minnesota Also with input from Sri Sritharan	
	Title: Testing and Analysis of Nonrectangular Walls Under Multi-Directional Loads	
	Equip. Site	Contacts
UMN	French	

¹NEESit Use Case Analysis, TR-2005-0061, S. Whitmore and A. Birnbaum.

- ITSC recognizes that some of the data tasks for the Soil-Foundation-Structure Interaction user scenario have been completed, and that additional resources (funding and personnel) may need to be made available to facilitate use of this as a case example. The ITSC recommends that NEESinc and NEESit identify resources to support this added work.
- NEESit shall carefully consider elements of existing (context dependent) user data models developed under prior NEES projects as NEESit develops a generalized (context independent) data model to be applied to these cases.

3) Hybrid Simulation

- Hybrid Simulation (including both single-Site and multi-Site Hybrid Simulation capabilities) was also identified as a high priority and an important future direction of NEESit. Although the ITSC finds that 'data' and 'telepresence' scenarios above must be higher priorities of NEESit efforts at this time, Hybrid Simulation should be pursued as a third priority in FY2006 with the continued participation of one FTE NEESit member. Interaction with a relevant case study project should be maintained and strengthened.

4) Data Flow Conduit and NEESit Deliverables for FY2006

- At the conclusion of the ITSC December 12-13 meeting and in following days, a subset of ITSC members and NEESinc personnel drafted a revision of the "data flow conduit" chart consistent with the initial concepts outlined in the Board-approved *Data Sharing & Archiving Policies and Guidelines*. The chart intends to provide a reference data conduit model delineating tasks and responsibilities between Researcher, Equipment Site, and NEESinc. NEESinc will prepare an updated version of this chart.
- NEESit is to prepare the following items in time for the ITSC at its next teleconference to develop recommendations for Board review at the February 3-4 meeting:
 1. A concise summary of deliverables to be provided under DataPlus by NEESit and its subawardees. These software tools and other software descriptions should clearly address each of the steps in the data flow conduit diagram and be framed in the context of a cohesive vision as provided; and
 2. An initial list of file formats that will be supported by NEESit software.

5) Change in NEESit Subaward Scope – Michigan

- The ITSC discussed scope and deliverables of the Michigan subaward, the functionality provided by products delivered under this subaward, and user adoption of the products. The ITSC recognizes and appreciates the diligence of the Michigan subawardee. However, NEESit indicated that in the future, the toolkit under development at Michigan would not be needed since CHEF/Sakai does not fit within the new NEESit philosophy of centralized services which would create lighter weight applications better suited to the NEES user community. Since members of the committee indicated that CHEF is not being used widely within NEES and that they personally had not found CHEF useful, the ITSC agreed with the idea of moving this application to central services under NEESit. NEESit has notified Michigan that their subcontract is likely not to be renewed in March 2006.

In discontinuing the Michigan subaward, the ITSC must be assured that all the functionality currently provided or planned by CHEF/Sakai that is appropriate for NEES will be available through NEESit. NEESit should prepare a short document to be discussed at the next ITSC teleconference describing how this will be accomplished. In particular, NEESit should identify the features from CHEF/Sakai that need to be incorporated into central services and also identify overlaps with CHEF/Sakai and any unique functionalities/added value CHEF/Sakai brings to NEES. The ITSC will prepare a final recommendation to the Board regarding the subaward to Michigan during the teleconference.

6) Change in NEESit Subaward Scope – Oregon State

Some of the information related to this item came to light after our December meeting

- The ITSC discussed scope and deliverables of the Oregon State (NACSE) subaward from NEESit as well as the separate revenue stream being provided to NACSE under the Equipment Site O&M funds. The need for better coordination of activities under these separate funding streams was discussed as well as the need to re-align proposed subaward work scope to the new priorities of DataPlus. The ITSC recommends two actions be completed by March 2006:

1. The IT-related funding passing through the Equipment Site O&M subaward that is in excess of normal IT support functions for Sites (approximately 8%-10% of O&M subawards) be reviewed and re-directed under the authority of the NEESit subaward to provide a clearer means for coordination of activities and a more direct path of accountability for IT services.
2. The current scope for the subawardee shall be revised to fully support high-priority activities identified in the DataPlus plan.

7) Feedback to NEESit: Refine Long-Range Vision & Improve Transparency

- The ITSC commends NEESit for providing a high level of attentiveness and responsiveness to the NEES user community since its activities began. However, there is a general view among the community that the level of productivity of NEESit was high for the first 6-month period of operation, but that productivity has apparently either diminished since that time or activities are not being clearly communicated to the user community.
- The ITSC believes that NEESit has been expected to articulate a compelling overarching vision of NEES, and of NEES' IT infrastructure that both drives and supports its activities. Precisely such a vision has been put forward in several different ways by the NEES community since the inception of NEES, and this vision was often discussed directly with NEESit staff while NEESit updated the user requirements for IT capabilities within NEES during its first year of operation. All decisions within NEESit should be made within the context of a cohesive vision for the role of IT within NEES, hence this vision needs to be well embedded in (running through the blood of) NEESit leadership and staff. While it is appropriate for NEESinc and the ITSC to define this vision in conjunction with NEESit; it is equally important that NEESit be able to articulate it, present it as needed, and implement it.
- The ITSC recommends that NEESinc leadership take the lead in developing a compelling vision document and presentation on IT in NEES, developed in conjunction with NEESit and ITSC, for initial consideration at the February Board meeting.
- The ITSC recommends that NEESit use the vision provided by NEESinc to develop a clear and uniform framework for describing its complete software suite including a mapping of how various software components and their functionality fit within the activities of the end-to-end processes. Gaps in functionality shall be clearly identified.
- The ITSC recommends that NEESit increase the transparency of its activities by providing to the user community a clear basis for expectations. This should be incorporated into the agile processes strategy for software release proposed by NEESit (see next item below) and into the mechanisms for tracking of user issues (Fogbugz).
- To improve communication with engineering end-users, the ITSC recommends that new products be described in terms of functionality provided rather than in terms of software description.

8) Adoption of “Agile Processes” for Development and Release of NEESit Software

- The ITSC heard from NEESit regarding their preference to adopt “agile processes” for development and release of software and policies that will provide more frequent incremental releases. The ITSC supports a monthly release schedule but cautions NEESit that more rapid turnaround cannot result in diminished software development, documentation, and product standards.
- The ITSC also recommends that NEESit incorporate a close linkage of ‘agile processes’ to direct user feedback provided by general NEES users in addition to the targeted use through implementation of software in conjunction with the case studies

9) Offsite Storage of Experimental Data

- Most NEES data is stored only locally. Unless offsite storage is provided and an appropriate policy enacted, there is a risk of losing data that should be preserved. The ITSC discussed the issue of offsite storage of experimental data as an essential element of assuring that “no data is lost”. NEESit is examining services that can provide such storage for files uploaded into NEEScentral. No consistent policy or process for offsite storage of experimental files held locally at Equipment Sites is in place at this time. The ITSC recommends that a clause be added to the *Data Sharing and Archive Policies and Guidelines* requiring all Equipment Sites to provide a plan for offsite backup and storage of all raw data within two calendar weeks after an experiment

is conducted unless otherwise justified in the Data Sharing Plan. NEESinc and NEESit will encourage the use of NEEScentral for this functionality.

10) Appropriate Role in Leadership of Cyberinfrastructure Security

- The ITSC commends NEESit and NEESinc for expending valuable resources toward the development of its forward-thinking cyberinfrastructure security policy (*NEES Cyberinfrastructure Security Plan*²) and the complementary draft implementation plan (*NEES Consortium Cybersecurity Practices*³). At the same time, the ITSC is concerned that NEES is expending valuable FTE's by taking a lead role in an area where an Engineering MREFC instead should be following the lead of TeraGrid and other major OCI efforts. ITSC recommends to the Board and to the NSF that NEES continue with its implementation of excellent cybersecurity practices, but decrease its efforts to drive national cybersecurity policies forward.

11) NEESit Support of Simulation Tools

- The ITSC discussed user requests for alternative current and future general-purpose simulation tools (OpenSees, ABAQUS, ANSYS, DIANA, etc). Issues pertaining to long-term support for OpenSees were raised given the uncertain nature of future PEER support. The ITSC recommends that OpenSees be the sole analysis software package to be supported at this time due to the open source framework of that code, but that other commercial analysis packages that are supported by SDSC shall be made available to users.
- The ITSC recommends that a subcommittee be created to investigate and assess simulation and visualization tools in use and in development that may, at some future time, be brought into the NEESit software framework.

12) Visualization

- Visualization will play a crucial role throughout the life of NEESinc. It is currently contemplated that visualization activities will become a major focus in NEESit only in future years. Nonetheless, the ITSC recommends that NEESit devotes and leverages sufficient resources on visualization activities to ensure that results of the end-to-end data organization and telepresence use case scenarios undertaken in conjunction with the case-study projects can be presented at the end of 2006 to the earthquake engineering community, the National Science Foundation, and other stakeholders in the form of first-rate visualizations.

13) Contributions of Equipment Site IT Staff Towards Community Software

- The ITSC understands that some of the most popular NEES community software has been developed and contributed by IT staff located at Equipment Sites where there is extensive interaction between engineers and IT expertise. The ITSC commends the individuals involved in these activities and recommends that the Board and NEESinc recognize these important contributions. Further, the ITSC recommends that the Board adopt a resolution that work on community software by Equipment Site staff that is well coordinated with NEESit be recognized and encouraged as part of the 'flexible scope' activities (per terms of O&M subawards) of Equipment Site.

14) NEESit Site Review on March 20-21

- The ITSC recognizes that NEESit will be host of an on-site review scheduled for March 20-21, 2006 that is part of the extensive 2006 NSF "Rolling Site Visit". The ITSC emphasizes to NEESit the importance of having a clear and compelling 'vision' document and presentation prepared for that Site Visit.
- The ITSC recognizes the importance of having a clear voice of NEESinc governance present at these meetings to support NEESit's description of the NEES community vision and priorities. Therefore, the ITSC recommends that one or more representatives of both ITSC and the Board be present during the Site Visit.

15) NEESinc Administrative Access to NEESR Project Files

- The ITSC heard a request from NEESinc Headquarters to provide a means for administrative (read-only) access to NEESR project files for purposes of tracking advancement along the data flow process in compliance with the researchers' agreements with the NSF and NEESinc. In the past year, NEESinc

² *NEES Cyberinfrastructure Security Plan*, 2005-07-10, W. Deng and L. Van Den Einde

³ *NEES Consortium Cybersecurity Practices*, (for internal use only), W. Deng and K. Mish

individually contacted users of approximately 14 NEEScentral accounts, and was provided member access to all identified research projects. A more expedient mechanism to achieve this outcome is sought.

The ITSC also heard of potential concerns about proprietary data and the need for confidentiality. The ITSC recommends that NEESinc develop, and the Board approve language amending the *Data Sharing and Archive Policies and Guidelines* granting the appropriate NEESinc HQ personnel access (read only) for administrative purposes only to all shared-use project files unless a compelling justification is provided by the researcher in their Research Participation Agreement (RPA) denying such access. The clause shall state the above NEESinc Headquarters staff will observe strict standards of confidentiality, and access accounts only for purposes of monitoring progress along the data flow process.

16) Development of NEESit Performance Metrics

- The ITSC held initial deliberations regarding appropriate “performance metrics” that shall be used to monitor the progress of NEESit. Metrics such as tracking non-staff usage of NEEScentral and alternative data ingestions metrics (number of files, total megabytes uploaded) were found to be useful, but not sufficient.
- End-product metrics such as tracking ‘percentage of data sets on schedule per policies’ and ‘software user adoption’ and ‘software functionality’ were also discussed as being more meaningful to the ultimate interests of the community. The issue of whether NEESit has sufficient control of these metrics was raised, but NEESit suggested its willingness to become a stakeholder in NEES success provided there were means to account for due diligence in the event that partner cooperation was insufficient.
- The ITSC has no recommendations for specific metrics to be used at this time, but will continue to examine this issue at future meetings.

17) “Conformance Levels” Concept for non-NEES Data Archives

- The ITSC heard from NEESit regarding their interest in adopting “conformance levels” as a means to characterize data sets held in NEES’ permanent data repository. The ITSC views adherence to the data flow process as defined in the *Data Sharing and Archive Policies and Guidelines* and derived processes as sufficient to characterize data developed under NEES shared-use projects. The ITSC heard from NEESit regarding interest in archiving other non-NEES data sets, and that conformance levels would be helpful in characterizing such data sets.
- The ITSC has no recommendations on non-NEES data sets at this time, but will continue to examine this issue at future meetings. Specific issues to be resolved are the compatibility of “conformance levels” with the data flow process, and what role NEESit should assume in becoming an archive for other data sets of potential value to the earthquake engineering community.