

**Notes from TIC WG E Conference Call #2  
Friday, August 27, 2004 (1:00–2:08 pm EDT)**

**Participants**

Walter Arabasz, Chair/Recorder  
Ray Buland  
Tom Murray  
David Oppenheimer  
Rick Schult  
Mitch Withers

Absent: Art Lerner-Lam, Phil Maechling (excused), Tony Shakal

**Agenda**

Discussion of issues and guiding principles for revising OFR 02-92, particularly suggestions raised by David Oppenheimer (in recent e-mail exchanges) for revamping ANSS as a system.

*Note: At the heart of David's thinking is his belief that the model for "Network Architecture and Interconnection," presented in OFR 02-92, is fundamentally flawed because it perpetuates the status quo with its attendant problems. From an operational perspective, David argues instead, among other things, for (1) having regional seismic networks function primarily as data-collection nodes and as backup to a more centralized system and (2) creating a structure with centralized reporting, data processing, and data archiving for the entire system.*

*Because the working group's deliberations are still in a formative stage, e-mail exchanges among the group members—including lengthy presentations by David Oppenheimer of his suggestions—are accessible at this time only on the group's password-protected internal Web page. —WJA*

**SOME BUSINESS ITEMS**

- Members of our working group who will travel to St. Louis for the September 26–27, 2004, meeting of the ANSS-NIC have agreed to a piggyback, working-group discussion on Monday, September 27. Time to be decided when we confer at the NIC meeting.
- Mark your calendar: First face-to-face meeting of our working group will somehow be piggybacked onto meeting of the ANSS National Steering Committee in San Francisco, scheduled for November 18–19, 2004.
- If warranted, informal meeting of working group members may be arranged during Fall AGU meeting in San Francisco (December 13–17, 2004).

**Conference-Call Discussion**

At the outset, Walter Arabasz invited Ray Buland and Tom Murray, who hadn't yet put forward their ideas on issues and principles to offer any thoughts. Ray Buland declined [and provided later input after the conference call]. Tom Murray said he found himself "more in

Dave's camp." Tom agreed there was a need to separate normal processing from informational and interpretive functions. From a practical point of view, he felt it would be manageable to attack one or the other parts—and he suggested we focus on the process of data flow.

Walter Arabasz suggested that, based on our earlier e-mail exchanges, it was a given that we would be addressing political aspects of network funding under something like a "Road map for Partnership." Hence, we could set aside those issues during our conference call and focus on technical issues.

**David Oppenheimer.**—David elaborated on his earlier e-mail proposals. He said he wanted to make two points. The first was his experience with the California Integrated Seismic Network (CISN) and attempts to build an integrated system. From the start it was difficult technologically. When funding appeared from the state of California, the tendency among the participating networks was to preserve their tasks and funding, which posed some challenges for system building. He described the process of building a fully functional statewide system as "far along" and "with a light at the end of the tunnel," and the outcome will be that the major network centers in California "can all do the same thing." David suggested that this California model was extendable to the whole Nation. He also emphasized that "The customers are not us. Our [primary] customers are not seismologists."

The second point David made is that software in CISN is not yet finished. There are still major structural flaws. Some promising solutions are emerging from the Earthworm group in Golden, Colorado, as part of a major software/hardware rehab of NEIC. Final software results from CISN and NEIC efforts could and should be rolled into one system. As a network operator, David said he was thinking about customers. What would you like it to look like? How should we patch together what we have now?

David referred to his e-mail proposal of having data from regional concentrators go into one central processing center (one earthquake, one solution) professionally staffed around the clock. He said the system ought to be like that of any corporation and he made a comparison to how major banks operate (e.g., check processing, account handling). He acknowledged that there are sensitive issues in ANSS like local attribution, but he believes local interests can be served.

Walter Arabasz asked David a clarifying question about the CISN model. Because CISN doesn't include one central processing center, what was his thinking about extending the CISN model to all of ANSS? David explained that the network centers in California are all interconnected by a private T1 telecommunications ring with 1.2 Mbps capacity. If the link is severed in two places, the contingency is to revert to Internet connectivity. The CISN network centers exchange all pick information and decimated waveforms. If more dollars become available, full waveforms will be exchanged. Currently there is multicasting from 30 data loggers in the field to both northern and southern California. CISN is moving toward common software and hopes to have a prototype system by the end of 2004. To the extent possible, network centers in both northern and southern California "will get the same answer." As it relates to ANSS, David said, "Think of this as two processing centers"—namely, a central center and a backup.

Dave asked Ray Buland, who was a member of the original TIC, for his perspective on system building in the original TIC plan. Ray replied that, in general, there was less disagreement on technical issues than on political ones.

**Mitch Withers.** —Because he reacted with lengthy comments to David Oppenheimer's original e-mail proposal, Mitch Withers was given the chance to elaborate. Mitch explained that he wanted to see a single, well-defined system, and he wanted to have redundancy without unnecessary duplication. But he questioned whether things could be done effectively at one national center. The basis for his concern and skepticism was his experience with the U.S. east of the Rockies, particularly in attention and responsiveness to smaller earthquakes. In the Mid-America region there has been much less technical planning than in the CISEN. There has, however, been planning to the extent that tasks needing to be accomplished have been tabulated, and responsibilities for handling each task have been assigned to a primary and secondary party. Mitch also elaborated on details of processing local data that, in effect, are better done at the regional/local level.

David agreed that lots of effort has gone into improving the processing of local earthquake data at regional centers in terms, say, of tuning subnet triggering and velocity modeling. In aiming for state-of-the-art event locations, David said, "I've got my own local network and want the data processed correctly." He believes that regional network operators can "have their cake and eat it too" by having a central processing center—properly guided by input from the regional network—to do the processing work for them. We need a vision of where we want to go and what algorithms should be written. David continued, "I'm not saying that all data processing would take place at one center, [but this] type of thinking should go into design."

Rick Schult asked David a clarifying question about the centralized processing system and whether it would do the kind of subnet triggering and refined local-type processing that David described. David replied that the central processing group would work with local seismologists to configure the processing system so that local needs are met. In effect, it would be a national system with capabilities to handle local needs.

Ray Buland commented on David's ideas from an economic perspective. He suggested that the direction we take depends on the projected ANSS budget numbers one believes. For example, if ANSS's annual budget remains low at roughly \$5 million, there's going to be pressure to aggregate functions to do a better job. Simply put, the more centers you have, the more it costs, and the option of "outsourcing" to reduce costs needs to be considered.

Tom Murray countered that as you centralize, you tend to lose local support and performance to customers tends to drop. Another model Tom suggested, was the National Weather Service. There are local weather officers because of needs, but basic processing and quality control is done at a higher level. Interpretation is separated from data acquisition. David Oppenheimer thought the National Weather Service was a good analogy and merited more consideration and discussion. The Weather Service needs stations on the ground [hence local involvement]; the extent of local needs has to be examined. Tom said that in Alaska, the main goal of the local meteorologist is to have all data available to him. The conversation briefly continued on the subject of interpretation versus processing and what functions are appropriate for centralization.

Mitch Withers added that part of the problem may be language. Do tasks need to be centralized or distributed? David suggested that automated processing of earthquake location and magnitude and ShakeMaps could be done better at a centralized facility. Expertise is necessary at the local level, but there has to be "one official word."

Walt Arabasz returned to earlier comments seeming to represent USGS points of view that the dollars being spent on network monitoring were USGS dollars and that cost efficiencies could be achieved by aggregating functions into the USGS. His point was simply to sensitize USGS working-group members to these “hot-button” issues and to frame discussions so that we wouldn’t create unnecessary stumbling blocks for ourselves or others.

David Oppenheimer pointed out that, to date, USGS managers had done a good job in creating a vision and pushing for new instrumentation—basically with the idea of getting data and worrying later about processing. A similar visionary push could be made now for processing. Walt Arabasz suggested that to get “buy in,” the primacy of the Advanced National Seismic System was important. Just as the founding fathers built up consensus under the name of “the United States of America,” network operators similarly might be persuaded to buy in if their “window to the world” and the main Web portal that outsiders went to for U.S. earthquake information appeared as an “ANSS” and not a “USGS” Web site.

Rick Schult asked Ray Buland how much money it would take to achieve the kind of software level implicit in David Oppenheimer’s conceptual proposal for centralized processing put forward in an earlier e-mail. Is the \$5 million program funding level not enough for a software start? Ray responded, “I didn’t mean to imply that at \$5 million we couldn’t start.” He added that, under current funding levels, there have to be cost savings to meet as many ANSS goals as possible. Software now is only a small piece of the \$5 million funding.

Rick continued his line of questioning, asking what it would take to achieve an overarching code model if there were consensus. Ray emphasized the importance of having a plan and a willingness to make compromises, but he considered it was do-able within the current framework. David asked what the costs were for the current NEIC rehab. Ray replied that they were roughly \$500 K/yr for salaries and that even that level of funding makes for slow going. David suggested that some funding might come from redirecting salaries [that is, redirecting other existing FTE efforts]. Also, ANSS could decide to shift the emphasis on spending from instruments to software.

Ray Buland pointed out that under the current funding framework, [USGS software developers] are doing what they’re doing because of direction from USGS management and a lack of other direction. Strong direction from ANSS will be needed to do otherwise.

In an earlier e-mail to the group, Rick Schult suggested that a guiding principle for ANSS system design be an explicit customer focus such as described in NIST’s Baldrige National Quality Program. Walt Arabasz asked Rick whether he had any experience with the Baldrige approach; Rick replied that the Air Force had been using the Baldrige approach for five years. He said the approach can be helpful to get beyond “political” hurdles to consensus. Questions relevant for us, for example, are: How to serve customers? How to design a system? The Air Force view is that the Baldrige approach is “one way to enforce common sense,” and it can help organize people.

As we approached the end of the conference call, David Oppenheimer asked Walt Arabasz where he saw our working-group process going and how much writing he envisioned. Walt replied that he would try to create a strawman action plan and timeline. In general, we’re developing a vision that’s different from that in OFR 02-92 and we have to put together the pieces that, first, we can reach our own consensus about and, second, put before the rest of the TIC, the NIC, and so on. Walt said he is pushing the NIC to convene a conference of ANSS participants, similar to one [convened by the Council of the National Seismic System]

for seismic network operators in Memphis, Tennessee, in 1997. He said this would be an ideal target for our working group to present and explain its vision for an ANSS system to the rest of the ANSS community. Regarding writing, he said he wanted to finesse our writing tasks to avoid a complete rewrite of OFR 02-92. He added that his gut instinct tells him we'll need writing efforts in two areas: first a description of a Roadmap for Partnership [to deal with political hurdles to consensus-building] and, second, a description of the technical details of the vision of where we want to go and a plan outlining steps for how to get there.

ACTION:

- Walt Arabasz to put together a strawman "Action Plan and Timeline" to meet TIC Working Group E's charge for deliverables.