

Date: February 17, 2020

TO: Mr. Valdez, Executive Director – NM Board of Licensure for Professional Engineers and Professional Surveyors

FROM: Earl F. Burkholder, PS, PE, F.ASCE

Thank you for the opportunity to sit in and listen to deliberations of the NM BOL on Friday. I found it most informative. Please share this information with all members of the BOL as appropriate.

An ulterior motive for me to attend the meeting was to witness any action on the basis-of-bearing issue. Didn't happen. I'll suggest to the NMPS President that an inquiry from NMPS to the BOL may be in order.

Separately, I am grateful that the BOL reacted to my small request in a positive manner – that is to be on the Agenda for the April 2020 meeting. As I tried to relay. . .

- I wish to share some observations (and raise some questions) from a more philosophical perspective.
- I do not intend to ask the BOL for anything or to take any action.
- But my aspiration is that the BOL will use what I share to discuss among themselves how to improve efforts to protect the public against incompetent practice.
- Through no fault of yours or individual BOL members, the public is getting “shafted” because technology is running faster and getting ahead.
- One could say that it comes under the umbrella of disruptive innovation. . .
<http://www.globalcogo.com/DisruptiveInnovation.pdf>
- Two examples include:
 - a. The basis-of-bearing issue. The problem there is not that the BOL got caught including irrelevant material but that the BOL has dragged its collective feet in correcting the oversight.
 - b. The 2022 datum retreat material includes incorrect information about longitude east. We all make mistakes and “fix” them as appropriate. Cliff Spirock readily acknowledged the mistake and little/no harm is done if/when corrected (it is fortuitous that the mistake did not make it into the Minimum Standards.
- From my perspective, I bring much more to the table than BOL members give me credit for. Several examples include. . .
 - a. Since publication of “The 3-D Global Spatial Data Model,(GSDM)” persons at the National Geodetic Survey (NGS) have sought to discredit portions of that work. The process has gone on since 2009 with the latest formal document being published by ASCE as a Discussion/Closure of an article written by Soler/Han. The Discussion is not easy to read but it is posted for any and all to see, read, download. The quality of my work is vindicated, and the 3-D concepts are proven reliable. I invite any and all to download, to read, and to study that material. . .
<https://ascelibrary.org/doi/full/10.1061/%28ASCE%29SU.1943-5428.0000274>
 - b. With the publication of the 2022 datum, the NGS is promoting the use of low-distortion-projections (LSPs). But, LDPs are 2-dimensional while we work with 3-D digital spatial data. I have a lot to add here as well. . .
 - i.) LDPs do offer significant benefits to local users – if used correctly.

- ii.) The problem is, I have experience in working with LDPs since 1973 and am intimately familiar with their features.
- iii.) But I also encountered many (vendors and users alike) who, not understanding the geometry involved, often did it wrong. The public deserves better.
- iv.) I documented the challenge in my MS thesis published in 1980 – Cliff has read and learned from it.
- v.) Glen asked if I could speak for NGS – no, I cannot.
- vi.) But I know what NGS is doing and I am familiar with the challenges involved. Collectively end users will need to address those challenges.
- vii.) Not surprisingly, the 3-D GSDM avoids the problem of grid/ground differences. The GSDM also offers other benefits.
- viii.) I do not expect the NM BOL to embrace the GSDM, but NM citizens deserve competent use of 3-D digital spatial data.
- ix.) And, I'll agree that NGS is doing what needs to be done to get ready for the 2022 datums – but their recommendations are not the ultimate 3-D solution.
- x.) Looking beyond 2022, there is much work to be done to raise surveying practice to the competent level the public deserves. We can't get there in one fell-swoop but, in my opinion, it would be a tragic mistake to view use of LDPs as the solution rather than one of many steps in the advance of progress.
- xi.) The letter submitted to NGS can be informative. . .
<http://www.globalcogo.com/NewDatum2022.pdf>
- xii.) Yes, to do that, the NM BOL would need to engage experts to provide guidance in development of competent spatial data services to NM citizens. Yes, I have the expertise that could be utilized by the NM BOL.

- c. In the education arena I have extensive previous experience. During my tenure at NMSU I was able to teach concepts and relevant material but the NMSU administration and faculty (and the NM professional surveyors) failed to recognize or to take advantage of the talent I have to offer. Previously while teaching at Oregon Tech, we did two things superbly well. . .
 - i.) Curriculum design and
 - ii.) Student advising.

In spite of my offer to share insights, it seemed that the program at NMSU relied on teaching the procedure (technology) rather than emphasizing underlying concepts. I have recently posted a list of articles that I wrote and published in the NMPS Benchmarks – much can be learned from the articles devoted to education.

<http://www.globalcogo.com/education.html>

- The 3-D concepts I'm promoting extend beyond NMSU, beyond NMPS, beyond the state of NM, and beyond the practice of surveying. I'll remind readers again of my current project to develop a paper describing "The Role of a Model" – see <http://www.globalcogo.com/role.html>
- Given 5-10 minutes at the April meeting of the full BOL, I'll lay out the issues and invite questions. I'll take as long as you like. But the discussions can and should go on for a long time. The surveying profession has an enormous gift for the spatial data user community, and I'd like to believe the NM BOL could be part of that exciting exercise.