

The Principles for Spatial Data Reporting in the Gulf of Mexico

Presented to the Workshop discussing Spatial Data reporting requirements for the MMS GOMR held August 22nd in the department's New Orleans office.

by

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For a number of years between 1985 and 1993, using Magnavox 1502 NNSS and then later WM-101 and Trimble GPS satellite receivers, I was privileged to have flown extensively over the GOMR's concession areas. This while a surveyor on contract to Shell Oil from Geodetic International, Inc. (GII) with a then office in Houston, TX.. GII were a subsidiary of the Swiss surveying firm Geodetic & Construction Survey Company headquartered in Winterthur, Switzerland. At the time, Geodetic was a successful surveying company catering primarily to Shell International but also to any oil company requiring land or marine positioning services worldwide.

During that time I was able to see first hand the lack of accurate positioning in the area. Near the end of the period GII was finally able to establish a GPS network tied to shore based USGS first order monuments that stretched across the western half of the Gulf involving some 20 or so offshore platforms with five onshore survey stations. The errors within the NAD 1927 datum were exceedingly clear and even a two meter longitudinal error in the USGS NAD 1983 datum appeared to exist amongst the five stations visited.

Shell relied on this network for the precise positioning of their seismic exploration vessel MV Shell America for a number of years. The stations were used as bases for the vessel's primary radio navigation system and then with the advent of on board differential GPS positioning as a backup and test system to ensure the accuracy of the new technology as GPS evolved into many commercial uses.

As each additional platform or group of platforms was selected as the basis of the radio navigation system so we obtained boarding permission from the various platform owners and positioned the platforms. At the time sufficient ties were made between the newly surveyed stations and to those previously surveyed so as to allow for a multi station adjustment to be made using all the collected data to date. Then having completed the mathematical readjustment, the final satellite datum positions for each location were transformed to the appropriate local survey datum used at the time by client, platform owner and government depts. Final positions for the new platforms were normally available within two days of the survey ending having typically involved 8 to 10 platforms over the space of 5 days. Time necessary to complete, procedures and equipment changed frequently as GPS technology evolved, but over time a large network was established.

However, as this time went by, the network fell into redundancy virtually as quickly as it was developed. By the mid nineties ship to shore and then ship to the world of networked differential GPS positioning quickly made the need for local survey networks and radio navigation as the primary navigation system redundant. Arguably there is still a need for them as secondary backup systems but even these can be instantly linked and function relative to world wide GPS networks.

This preamble or quick historical recap brings me to the subject of your workshop today. Indeed I would have loved to join you today but unfortunately due to health related matters I am unable. The organizers today however have done me the honor of making this opinion of mine heard amongst you today. For this I am extremely grateful. Anyone who knows of me, also knows I have a passion for the subject of oilfield positioning in all it's facets and that I was often out spoken at times when I felt the survey profession was not getting it's fair share of attention from the industry it served.

Given that MMS GOMR seems to wish to retain an old and well proven inaccurate land based survey datum, NAD 1927, into the third millennium is a shame. While understanding that the cost associated with changing are huge and the issues complicated both are less than those undertaken by the Interior Department's land survey group that recognized the limits of NAD 1927 and then made the decision to change to an essentially earth centered datum. It is a pity that the MMS didn't follow suit at the time for reasons that are completely unknown to the writer.. The attempt to extend a land based datum beyond it's limits is a very questionable survey procedure and a decision probably made as the least expensive option when platforms were first erected in the Gulf's surf back when?

Given also that GPS is here to stay for the foreseeable future as a worldwide, easily accessible positioning framework and one that demonstrably provides a level of accuracy beyond that apparently acceptable to MMS. The onus therefore, to convert or transform coordinate sets from the accurate to the less accurate, is very much upon the MMS itself and should not ever be a requirement for the consideration of information providers. There should be no compulsion whatsoever for any reporting to be done in any datum other than that of the satellites themselves. This would ensure the MMS that they know all the pertinent information they need when supplied with a WGS 1984 Latitude, Longitude and Ellipsoidal Height for a new location.

How the MMS then wish to display the data in their cadastre becomes entirely their in-house business. This would eliminate any decisions on datum transformation values by the uneducated together with fiddling and finger problems associated with datum conversions by an industry with a strong history of ignorance when it comes to positioning matters. This ignorance will probably only get worse as the general public's appreciation of positioning becomes that associated with driving their family car. It is at this point that the accuracy of GPS can be severely and completely unnecessarily degraded.

I ask then why should the MMS run any risk what so ever of obtaining any data other than that referenced to WGS-84 and it's appropriate epoch.

If the MMS continues it's use of NAD 1927 within it's portals then in return, the MMS must undertake to supply data only in the same datum as that in which they receive it . If a request for coordinate data in another datum is made then the MMS should be responsible for satisfying the request if they so wish. However, provided alongside the coordinate values in the required datum, should come the transformation method and the original WGS-84 coordinate values for the point. I would urge the MMS to consider a small financial charge for any data requested in anything but the WGS 84 datum.

Finally as the GOMR seem stuck with NAD 27 then they must also settle on an acceptable transformation program for their own use and publish this decision to the general public along with providing copies of the program to anyone wanting such. If NADCON Version 2 provides the latest and best algorithms at no charge for wrapping good to evil and returning evil to it's pristine state then this is the program for adoption. This is solely an MMS's decision as any outsider user of anything but NAD 1983 for shore based and WGS-84 offshore positioning needs to rethink whether they wish to join in crossing into the new millennium.

This then is my opinion. I'm obviously a strong supporter of doing away entirely with shore based datums. Their purpose, once required, is now no longer needed in a largely developed country.. Had this problem been addressed back when I hung up my hardhat, the process now would be to educate people that once upon a time we had a real mess in the Gulf of Mexico position wise. It was called NAD 27 but like the map made of by Columbus of America's eastern seaboard it has passed into history.

Lastly I'd like to thank the organizers for making this address available to the attendees today. I'd also like to thank all that have attended today's session. It's nice to know matters like this are still discussed. Finally, I hope that the outcome today is the best compromise that can be worked out for today's current information providers and users

With regards,

A handwritten signature in black ink, appearing to read 'Patrick Wheeler-Holohan', written in a cursive style.

Patrick Wheeler-Holohan

Biography

Patrick Wheeler-Holohan was born in England in 46. Educated in Land Surveying by the British Army, he joined Seismograph Service Ltd. (SSL) in 69 where he worked as a seismic surveyor in Oman. Returning to work on freeways in England in 70 he again went overseas in 71 with Globe Universal Sciences (GUS). He remained in the seismic field with Delta in Singapore and Seiscom in the US. He joined Philips Petroleum in 80 as their chief land surveyor but quickly returned to the contracting world with Geodetic as chief field surveyor for Shell in 82 for the development of their Sirikit oilfield in Thailand. After experiencing the onset of an incurable cancer in 85 he became GII's chief surveyor based in Houston. It was during this time that he gained the experience for this presentation. In 1993 with the closure of GII he formed Exploration Geodesy Inc. (EGI). Concentrating on providing the very best positioning as had GII, EGI has acquired and maintains a reputation second to none for providing it's clients with personnel from a cadre of highly experienced land and marine surveyors. Patrick's connection with the company ceased at the beginning of 99 when he sold EGI to one of his long time associates. He's now retired to the hills in Wyoming and can be visited at his wife's website at www.fourpines.com. He welcomes the chance to be involved in surveying matters but acknowledges that times have changed bringing new and unfamiliar technology by the second.