# EDITORIAL

## Be Careful What You Wish For

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I was out running errands today and needed gas. I stopped at my normal gas station and filled up for $1.79 per gallon. That was a little less than half of what I paid just two months ago. Certainly, the last few years we have all wished for the price of a gallon of gas to go down, or at least for the increases to slow down. Who could imagine that the price would drop so far, so fast?

I can remember when I first started driving that the price of gas was around $0.27 per gallon, and on occasion, during a price war, it would drop to $0.19 per gallon. I could wish for that but doubt that will happen. In fact, I doubt the price will stay as low as it is for very long.

But the price has been going down long enough and far enough that a number of news pundits have now indicated that this is a bad thing. Their theory is that this low price will wreck the energy industry that has struggled to become viable the last 10-20 years. If the low price continues, jobs will be lost and the economy could be affected, moving back into a recession. Energy that is viable when gas costs $3-4 per gallon is not cost effective at $2 per gallon or below.

Some of those same news pundits are arguing that gasoline taxes should be raised to keep the price at a reasonable level. Just what we need, the government getting further involved in the energy business. This is what happens when you get what you wish for . . .

More and more, I have been using my computer and an eReader to read technical articles along with newspapers and recreational reading. This is particularly handy when you are traveling, to keep in touch with the news and not have to drag along the printed copies of books. A colleague has been predicting, and yes, wishing for, the day when the eReader will eliminate most of the paper-bound reading that we do. Now, while I can see the advantages of the eReader, I still like to feel the paper and turn the pages when I am reading a book or a newspaper. It's probably just a matter of what I have become used to for all of these years, but there is a certain comfort to settling in with a novel or the Sunday newspaper.

While my colleague is getting his wish, there is some unsettling news from those same pundits regarding the use of eReaders. You see, the printed page does not emit light, just reflects it, but the eReader gives off light. The pundits are now warning that this emitted light interferes with your sleep pattern (particularly melatonin levels) in a way that reflected light does not. So, if you are having trouble geeting to sleep at night, after reading your tablet or eReader, you may have to turn down the back-lighting or get a book. This is what happens when you get what you wish for . . .

With respect to the technical world of sound and vibration, what have we wished for? Certainly, most of us have wished for improved hardware and software that are fundamental to our professional careers. This would include faster computer speed with more memory and storage along with faster communications with peripherals. Whether we work the experimental or analytical side of the issues, the hardware and software must keep pace with the complexity of the problems we want to solve. The size and complexity of the problem continues to grow so the need for enhanced hardware and software always increases.

Extreme environments require non-linear analysis and data acquisition methods. In my case as an experimentalist, I wish for enough resolution in the ADCs to eliminate the need to range the data channels. Assuming voltages from positive to negative 40 volts with resolutions equal to the best resolutions of past ADCs for small voltage ranges means that 48 effective bits of resolution will be about right. Then of course, I will need sensors and digital signal processing methods (windowing, etc.) compatible with this dynamic range.

Naturally, I would wish for hundreds if not thousands of data acquisition channels to handle the spatial detail required. I would wish for wireless sensors that run on harvested energy, although non-contacting sensors (photogrammetry or laser based) would be possible. There is that need to see around corners, though, for the photogrammetry sensors. While bits and pieces of this futuristic data acquisition system already exist, the financial burden will make such a system prohibitive. This is what would happen if you get what you wish for.

More realistically, I would wish for a secure and stable Internet, free of the cyber security problems that are beginning to cripple the dream. Twenty five years ago, when the Internet was beginning to be a reality, the potential of the Internet as a positive tool for education and science was without limit. The idea that communication and information would be generally available throughout the world seemed to be a dream that was coming true. Information about just about anything was becoming available 24/7, limited only by connection speed.

Today, some of the dream has become a nightmare. The only secure network is one that is not connected to the world. In the past, the web pages at my lab at the university have been hacked, and to avoid needing to rebuild the server, the server was simply disconnected from the world on weekends and holidays when monitoring was more difficult. At that time, most of the intrusion was simply mischief on the part of the intruder although the damage and cost was very real. With the recent cyber security attacks on Sony over the movie "The Interview," it is clear we are entering a phase that is more distructive.

Any organization that has access to its data or analysis via the Internet needs to be doubly concerned. Again, keeping an intranet that is not connected to the Internet is the only current way to maintain security that is then only limited to the personnel involved. Data can be stored in a sanitized format so that the absolute characteristics of the data require the knowledge of a secondary key to return to absolute units and scale factors. The cost of doing business in this cyber-security-conscious world is going to continue to go up. This is part of what we get when we wished for the Internet.

Finally, I would wish for responsible use of e-mail, texting and social/professional networking. Not a week goes by when I do not receive e-mail that is a pure phishing scam or that is an invitation, purported to be from a colleague, to join some social or professional network. When talking to the colleague involved, I am assured that they did not send the invitation.

On a couple of occasions, the invitation

has purportedly come from one of my children. In many of these cases, the person (or software!) claims to know me. The common practice of making public records available via the network (birth, death, property, legal records, etc.) contributes to the problem. Yes, there can be a legitimate public interest or right-to-know rationale, but that does not mean it has to be made so easy for anyone to obtain that information without reasonable screening.

Identity theft is part of this problem, since much of the identity-theft solicitations come via e-mail or via information posted to social/professional networks. If these concepts resonate with you, there is a new book from Andrew Keen, entitled "The Internet Is Not the Answer," which expands on the idea that the Internet is no longer our friend. At a minimum, we have to find ways to use the Internet to our own advantage. For some time now, I have not felt responsible to return an unsolicited telephone call, and that now extends to all kinds of e-mail and social/professional networking requests. I encourage everyone to become more diligent in responding to only the most obvious requests made via these pathways. This is the only way to get the e-mail and professional networking environment that we wish for.

What do you wish for in 2015 or in the coming years, socially, personally, technically, professionally? I hope this gives you something interesting to think about, and as always, I value your comments on my editorial. If you have comments, please feel free to contact me. S&V

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