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Alleviating Nuclear Energy Challenges

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Mr. Hoffman founded EXCEL Services Corporation in 1985 to provide specialized professional services to nuclear utilities in licensing and regulatory support. For more than three decades, EXCEL has become recognized as a premier worldwide supplier of enforcing operations and technical regulatory support services.

Mr. Hoffman is very active in the nuclear industry and is a Past President of the American Nuclear Society. He is also the president of Eagle Alliance.

Prior to starting EXCEL, Mr. Hoffman served in the US Nuclear Submarine Navy as a senior reactor operator and engineering officer and as a manager and lead reviewer at the Nuclear Regulatory Commission reviewing License Applications and Technical Specifications.

He has a bachelor's degree in Nuclear Science and Engineering Technology from Excelsior College.

An interview by Newal Agnihotri, Editor of Nuclear Plant Journal, on March 16, 2017 at the U.S. NRC Regulatory Information Conference in North Bethesda, Maryland.



1. Please describe the issues that have been the major challenges to the industry in the last six years.

The first issue was the Fukushima Daiichi event in March 2011, which had severe consequences on the global nuclear industry. It eroded further confidence of the American and global public in the capability for nuclear power to be operated safely, even though it was an event in just one location and many of the aspects were not applicable to other plants around the world and specifically here in the United States. The most important result of that event for the nuclear industry is that we focused significant time, effort, and human and financial capital over

the last six years on implementing post-Fukushima safety upgrades. That did several things to the industry. First, we were spending a great deal of human and financial capital focusing on safety upgrades related to the Fukushima event. Second, we found that many of our colleagues that we worked with as well as our stakeholders had lost a lot of the confidence. This

is because at that time, we were just getting ready to celebrate 25 years of safe global nuclear operation since the Chernobyl event in 1986. Consequently, Fukushima was a very sad culmination of that quarter century. Third, we found ourselves not only continuing to struggle and having the challenge of the normal activities, but also having to balance the integration of those post-Fukushima upgrades in our daily activities of maintenance, operation and continuation of safe activity.

The second issue that has posed a major challenge to the industry was very low natural gas prices. Those low prices caused an artificial impact to the market because nuclear was seen as even less of a value, simply because it could not get down any lower in price than natural gas. There were subsidies for renewables,

wind and solar, but not for the only clean baseload energy source – nuclear. So nuclear did not have a level playing field. However, nuclear was found to be a less expensive option per kilowatt than all the other sources other than natural gas. That included coal, oil, wind, solar, biomass and hydro.

The third issue that has become a major challenge in the last six years is that the electricity market is flawed in the sense that it doesn't value the unique aspects of nuclear. Nuclear just doesn't provide megawatts to the grid. Nuclear provides a unique capacity and capability, having the unique value of the three E's: energy, the economy and the environment. Not only does nuclear from an energy standpoint provide baseload, dispatchable, continuous capability to provide grid stability, providing electricity on a 7 day/24 hour basis, but from an economy standpoint, it provides almost half a billion dollars in goods and services to the local economy in the area in which each single nuclear plant operates. The three E's also create 700 to 1,200 good paying jobs at 42% higher pay than the state average. A single nuclear energy unit provides greater than \$20 million to local tax infrastructure for police, school, roads, firefighting, EMT services, hospitals and things that are so important to the community's success. A single nuclear unit also creates thousands of secondary jobs for dry cleaners, restaurants, movie theaters and other places for the people who are now working in that area. Additionally, it provides a further tax base for the state and federal governments of over \$75 million a year. From the environmental standpoint, nuclear is the only clean, carbon-free emitting dispatchable baseload power supply. Those are the physics of it. While wind and solar are essentially carbon emissions free, they are not dispatchable or baseload. Nuclear is the only one. Our nuclear power plants, which provide slightly less than 20% of the energy in this country, provide greater than 63% of the carbon-free electricity. The unique value proposition of nuclear from an energy, economy and environmental perspective is not being appropriately valued.

The fourth issue that has been a major challenge for the industry is that our policies are not appropriate. The United States currently subsidizes wind and solar power, which is appropriate for clean energy sources. However, if you're going to subsidize any clean energy source, you should subsidize all of them. Unfortunately, nuclear energy does not benefit from many of the programs (like Renewable Portfolio Standards or Investment Tax Credits) that support wind and solar despite being the only clean baseload energy source.

In summary, we had the challenges of 1) additional human and financial focus on Fukushima safety upgrades, 2) lower than ever natural gas prices, 3) a lack of appropriate valuation of nuclear in the states, the regions and the federal level and 4) our flawed electric markets and subsidies heavily in favor of wind and solar but not nuclear. These four challenges together have been the focus of our efforts. Despite all of that, the nuclear power plants in this country are operating more efficiently, more effectively and at higher capacity factors than ever before.

2. You said Fukushima did very little for the safety of American plants. Please elaborate.

The Fukushima safety upgrades which we implemented were not significant safety enhancements to the existing safety of our plants. The reason for that is the safety resulting from what we had already done at our nuclear plants and what we always have done at our nuclear plants. One safety upgrade example was the hardened vents for venting. That was an issue we'd already addressed for our BWR plants in this country. The second implemented safety upgrade was spent fuel pool monitoring, ensuring the capability to know the temperature and the continued cooling of our spent fuel pools. US plants always had multiple non-safety related means to keep the pool full and cool. The third safety upgrade implementation was the capability to ensure we had emergency AC and DC power supplies

on a continuous basis. We had already required that. We already established the requirements for our emergency AC and DC power supplies to be protected in concrete structures and also to ensure many of our fuel tanks were buried inside concrete structures underground. The fourth example of a safety upgrade made was the ability to make sure that we precluded the likelihood of internal and external flooding that disabled safety-related systems. The US plants are designed to all be independent, all established in their own core areas and with barriers to flooding. When you take those four areas out of the post-Fukushima safety upgrades, the impact to safety was minimal, but the financial cost and the human capital cost of focusing attention was tremendous. I believe that took a tremendous amount out of our industry for a very small return on safety.

3. How can we promote value of nuclear energy among our legislatures and executives responsible for making policies for energy?

There are different roles we all have to play. The most important role that anybody at the plant, whether they're an engineer, in maintenance, operations, technical, licensing, management, can play is to continue to focus on the safe, efficient and effective operation of their facility. The second role that we must fulfill is to continue to interface with our neighbors, friends, associates, colleagues and local members of Congress and local institutions to talk about the unique value of nuclear.

Other organizations, like the Nuclear Energy Institute, lobby on behalf of nuclear and to ensure that the message is getting out to the states, to the regional and to the federal policymakers and lawmakers. Other organizations, like the Sensible Energy Matters to America (SEMA), the 501(c)(3) that I formed in 2016, is set up as one of the many organizations which is out there to be another voice to policymakers and lawmakers to ensure they are hearing the story they may not be getting -- the story about the unique value of nuclear from

the energy, economy and environmental standpoint. This enables us to advocate for our industry policies to be revised and addressed in an equitable, fair, level playing field to give nuclear nothing more than an equal opportunity to provide to the success of the American electrical grid. This is what I feel we can do. There are many others like me. Not all will feel the need, will want to take the time or feel comfortable doing this. I feel comfortable talking about nuclear. So, I am more than glad to do so. It's a unique capability. I treasure it. I'm utilizing it and leveraging it to go and take the time to talk to our governors about ensuring that they are setting state policies that value nuclear appropriately. SEMA worked with Governor Cuomo in New York for the zero-emissions credit concept. We worked with Governor Rauner in Illinois for a similar process.

SEMA is working right now with Governor Christie in New Jersey. We're talking to Governor Kasich in Ohio. We worked with Governor Walker in Wisconsin to lift the new nuclear build ban. We met with Governor Bevin in Kentucky, and he's getting ready to sign into law lifting the ban and moratorium. The beauty of that law is that Kentucky has a unique need for small modular reactors. We're also currently talking to other governors. What we're looking to do is to give the states, the regional and the federal lawmakers and policymakers the information, the knowledge, and the understanding that they need to see what is necessary to establish fair and equitable policies which make the American public the winner in that they get an energy, economy, and environmental solution to their needs for baseload, reliable and available energy which provides an economic boost to the community, the state and the nation.

Our current administration has stated that it is not sure that there is climate change. I believe we need to be a little more pragmatic about the fact that human kind is affecting the global climate in various ways. Science would certainly seem to support that, and whether you believe all the science or some of the

science, I don't believe it's feasible to state that human activity is having no impact on the climate. Therefore, anything we can do overtly or indirectly to negate contributions to the climate which are negative, such as CO₂ emissions from activities like energy generation, we should and must do. I believe in it, and I will continue to push for it at all levels of the state, regional and federal governments. You see where the current Administration is focusing. You see them reducing EPA standards and reducing funding for the Department of Energy and for the Nuclear Regulatory Commission. I believe we can be more efficient and more effective in our government, but I think we must be cautious to ensure that we don't reduce budgets to the point that we are unable to continue to do the good work we've already done and the good work we can build on.

4. *Talk about your interaction with the Governors Association and several other organizations, where you reached out to so many governors at the same time.*

I have attended Republican Governors Association dinners and functions and spoke to the governors. There are 33 Republican governors and also governors of our various territories and regions. The best way to get to a governor is twofold. You can get them in a group setting where you can talk to them about the overview of the impacts to the nation and the impacts to their states. You can also go to see the governors individually to talk about the specifics of their respective states. I will do the same thing with the Democratic Governors Association and the National Governors Association this year.

I've spent a lot of my time advocating for these issues because I believe in them. I'm going to continue to be there because I'm passionate about our industry and believe I've made a difference and can continue to make a difference. If you can get people to change policies, to change their minds right in front of you, to rewrite requirements, to rewrite policy and to rewrite activities and responsibilities, you got to be proud of it and keep working

at it. Many of these people just needed to be informed. In many cases, it wasn't that they were against nuclear -- they just didn't fully understand its value.

If I have to go to every one of the 50 states and the other U.S. territories and regions to send this message, then I will. I've already been to about 20 states and my plans are to go and see every one of them. But I realize that one person cannot do this alone. I and others are but voices that together will change this discourse. I am proud to work with many organizations that do this good work.

5. *What do you see as EXCEL's role in alleviating nuclear energy challenges and fulfilling the nuclear promise?*

EXCEL is fulfilling the nuclear promise with the utilities. EXCEL knows what the delivering on the nuclear promise is. That's to ensure our plants are more efficient and effective while still enhancing and improving safety at the same time. That's exactly what we do. EXCEL has always been about enhancing safety, improving performance and reducing cost. The very fabric of what we do supports the nuclear promise for these plants, and we are integrated in all of the aspects.

One of the things we do is help utilities comply with INPO guidelines. We assist the utilities in compliance with all requirements that are 1) required by the Nuclear Regulatory Commission and 2) by any other entity and organization which may oversee them, which includes the EPA and FEMA. We do INPO accredited training and we also support these activities. We help the utilities ensure that they are meeting the requirements in the most efficient and effective manner while still ensuring the safe, efficient and effective operation of the facility.

We also at EXCEL specialize in supporting utilities with their challenges with all current regulations.

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