

Remarks of Jeffrey S. Merrifield

Third Annual Advanced Reactor Summit

February 10, 2016

I would like to join David Blee in welcoming you to the Nuclear Infrastructure Council's 3rd Annual Advanced Reactor Summit. As the Chair of the NIC Advanced Reactor Task Force, it is my pleasure to provide the kickoff industry remarks on Advanced Reactors.

With the exception of President Dwight David Eisenhower's Atoms for Peace speech in 1953, "Hallmark Moments" in the nuclear industry tend too often to focus on the darker moments in the history of nuclear power. Like the proverbial Eeyore from Winnie the Pooh, the hyper-focus on TMI, Chernobyl, and Fukushima and the unfortunate, but understandable concern about the shutdown of units like Vermont Yankee, the nuclear industry's own rhetoric and self-doubt contribute to public questioning about this technology and cast this industry in negative way. Unfortunately, this attitude tends to obscure what is truly an exemplary hallmark of achievement.

I think it is quite appropriate that we have our conference here at Oak Ridge, which is one of the world's premier facilities in developing Advanced Reactor technologies. To put it in its simplest form, scientists from around the world, spurred by the events of World War II, worked at this and its sister facilities to take mere radioactive dirt and harness it to create vast amounts of energy. Through the subsequent development of peaceful uses of nuclear energy in the 1950's at Oak Ridge and its sister facilities, the American people today benefit from clean, safe nuclear power that provides 70% of the U.S. carbon free generation and 35% of the world's carbon free power. This is an achievement worthy of boastful pride.

Today, the vast majority of individuals in the United States support nuclear power and they are increasingly aware of its significance in fighting global climate change. While many anti-nuclear activists are

slowly converting to a begrudging acceptance of nuclear power, or are slowly dying off, there is a growing and enthusiastic group of individuals under the age of 40 who embrace technology, who are not stuck in the past, and who are excited about the promise of Advanced Nuclear Reactors.

Two Thousand Sixteen will be noted for a number of very positive events in the renewal of nuclear power development in the United States.

- First, later this year, in this very state, Watts Bar II will begin adding power to our nation's electric grid becoming the first nuclear power plant to do so since its sister unit, Watts Bar I, began operations in 1996.
- Second, on Friday, January 15, 2016, the Department of Energy (DOE) announced the selection of two companies, X-energy and Southern Company with TerraPower, to further develop Advanced Nuclear Reactor designs. These awards, with a multi-year cost share of up to \$80 million for both companies, is intended to support work to address key technical challenges in the design, construction, and operation of next generation nuclear reactors. This followed on the Gateway for Accelerated Innovation in Nuclear ("GAIN") program, which the Obama Administration announced in late 2015 to spur further innovation and development of Advanced Reactors.
- Third, on January 12, 2016, the House Science, Space and Technology Committee, by voice, vote passed H.R.4084 – the Nuclear Energy Innovation Capabilities Act. This legislation which was introduced by Chairman Randy Webber (R-TX) and Lamar Smith (R-TX) and Ranking Member Eddie Bernice Johnson (D-TX) would promote nuclear research infrastructure and enable the private sector to partner with the National Labs to develop new innovative reactor technologies as well as test and demonstrate novel reactor concepts. A little over two weeks later, on January 28, 2016, the United States Senate, by an

overwhelming vote of 87-4, passed companion legislation, S. 2461, which was introduced by Sens. Mike Crapo (R-Idaho) and Sheldon Whitehouse (D-Rhode Island). Having worked in the U.S. Senate for 10 years, I have to say it has been decades since a pro-nuclear measure passed with this level of support.

- These are, indeed, very positive developments for nuclear power.

In mathematics, the word inflection point is defined as that point of a curve at which a change in the direction of curvature occurs – or in common lexicon it is considered a turning point.

While some in the U.S. nuclear industry have focused on the recent shutdown of operating reactors, I believe that the recent events in the Advanced Reactor community represent an inflection point in the development of nuclear power in the United States. Recently, I had a chance to represent NIC at a Third Way conference on nuclear reactors. For those of you not familiar with Third Way, it is a Democratic Leaning think tank which seeks common ground on issues such as energy and the economy. I was struck by the broad based and bi-partisan support at the conference for Advanced Reactor technologies and the enthusiasm, among both Republican and Democratic Members of Congress for the hope and promise that this technology represents.

I commend both President Obama and the leadership of the House of Representatives and the United States Senate for their support of Advanced Reactors. However, hope and promise are not enough. While these are solid first steps, they support a beginning, not an end.

As I look out at this sell out conference – which likely could have sold twice as many tickets – I am struck by the sheer number of technology developers that are represented in this room. Unlike the circumstances of a dozen years ago where a buyer of nuclear technologies in the United States had three choices – GE, Westinghouse or AREVA – the Advanced Reactor community represents a broad range of sizes, shapes

and designs. From the more traditional reactor vendors to the college-based startups, Advanced Reactors vendors represent a far different and larger cohort than their predecessors.

To fully harness the technology, the capabilities and the enthusiasm for this technology, we need to go big and we need to be bold.

The recent funding announcements were a wonderful commitment and they were the best that the Obama Administration could do within the currently authorized programs. However, if we believe that global climate change is real, if we truly want to make a difference in developing these reactor technologies, and if we want to electrify the world, we must put significantly more money on the table -- and I am talking billions, with a B.

Just so you understand what I am talking about, according to the Energy Information Agency, if you added up the amount that the federal government spends on renewable and biomass programs in 2015 - including direct expenditures, tax expenditures and R&D, the amount would total \$15 billion dollars. The comparative amount for nuclear is \$1.66 billion. That means that nuclear receives just 11% of what is dedicated toward renewables, despite the fact that nuclear is the only way we will achieve meaningful carbon reduction targets. As a country, we must get our priorities straight and provide the nuclear research, development and deployment monies needed to help these technologies succeed.

We must be able to move beyond a program where one or two “winning” companies can move forward with the full support of DOE. To fully embrace the vision that dates back to President Eisenhower, we must create a truly promotional focus within DOE that could support over a dozen reactor designs. Additionally, the President and Congress need to come together to create a robust research and demonstration program that not only provides the fast spectrum test reactor capabilities needed for fuel and component research, but comes with sufficient funding to allow their robust use and development.

Given the time I spent as a Commissioner at the Nuclear Regulatory Commission (“NRC”), I am well aware of the dedicated and talented people who staff this agency and the commitment that each and every one of them has to their independence and safety focus. That said, I think it is vital that Congress turns sufficient attention to the Agency as it prepares to review Advanced Reactor designs. For its part, Congress needs to understand that the current fee based framework creates a significant hindrance to early development and deployment of Advanced Reactors. Congress needs to provide the NRC with sufficient sources of funding – off the fee base – to develop a risk informed framework for these reactor designs.

Likewise, the Commission needs to recognize that the Advanced Reactor community needs a review process that is risk informed, timely and embraces the significantly smaller source term represented by most of the Advanced Reactor designs. I believe that there are committed individuals at the NRC and within the Commission who understand that changes need to be made and are working hard to identify potential solutions. In my view, the NRC needs to develop a review program that will allow these reactor designs to be approved in less than half the time as currently required for large light water reactors as they represent commensurately smaller risk to public health and safety. While the Agency cannot and should not promote Advanced Reactor designs, it can enable them by creating a regulatory framework that recognizes their comparatively safe design and provides a commensurate licensing footprint.

Finally, I would like to make some remarks focused on the Advanced Reactor Developers represented in the audience. To paraphrase an aphorism made famous by President John F. Kennedy, “A rising tide lifts all boats”. The greatest danger that this group faces, is if Advanced Reactor developers attempt to promote their technology by trying to undercut or tear down others within this community. To do so will only help to undermine the effort as a whole and will diminish the enthusiasm and support for these technologies. This is not to say that design concerns should be ignored, but this group needs to identify

opportunities to work collaboratively to achieve advancements that can benefit multiple technologies and allow a myriad of these technologies to develop and thrive.

In Washington, it has long been proved that people like a winner. The sheer number of groups that have jumped on the Advanced Reactor bandwagon, both inside and outside the beltway, is indicative of the type of enthusiasm these technologies have attracted. With all these voices, the Advanced Reactor community and the companies that wish to purchase these technologies need to be careful that they are not pushed and pulled in separate directions. Recently, Steve Kuczynski, the President of Southern Nuclear, stated his view that the Advanced Reactor Community would benefit from clear and unified voice. Steve and I agree As he chairs the NEI Advanced Reactor Working Group and I chair the NIC Advanced Reactor Task Force, we are working together to find a common approach to help this group move forward.

With that comment, I will leave you with a final thought. As a nuclear community, we cannot and should not allow ourselves to be measured solely by the achievements and events of the past. We need to look to the future. The developers and supporters of Advanced Nuclear Reactor technologies recognize that these designs represent truly transformational opportunities to provide energy and heat for people around the world. The carbon free, clean generation provided by these designs has the ability to improve the standard of living for billions of people around the world. It is within the power and financial capability of our great nation to advance the cause of these beneficial nuclear technologies and we can and should come together to make it happen.

Thank you and have a great conference.