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The Honorable Nikki R. Haley
Office of the Governor
1205 Pendleton Street
Columbia, South Carolina 29201

Dear Governor Haley,

Please do not let my North Carolina address throw you off, I grew up in Charleston, SC, lived in South Carolina most of my 48 years and hope to return home to Charleston before my retirement. I watch your State of the State address each year and proudly consider myself a South Carolinian. The reason for this letter is to share with you an idea I have for the old Navy submarine base in North Charleston.

While in the U.S. Navy, my father trained in nuclear power, was stationed twice in Charleston, SC and taught nuclear power before he retired as a Master Chief with 21 years of service. While in Charleston, my father was on submarine duty and typically spent 6 months away and 6 months at home. As a dependent child, I was able to board nuclear submarines on the occasional family day. After his retirement, my parents relocated to Lynchburg, VA where he worked for Babcock & Wilcox on nuclear projects supporting our military. While at B&W, he was a major player in their successful bid to supply and install magnets for a planned particle accelerator in Texas. Congress shot down the accelerator's budget and as a result the European CERN Large Hadron Collider received credit for discovering the Higgs-Boson particle.

I'm a Mechanical Engineer and worked for Cummins in Charleston for eight years and later for GE Energy in Greenville for another four years. I currently work for BorgWarner Turbo Systems as a Senior Project Engineer. I have a wife and two children. Our son would like a career in computers and our daughter plans to be a veterinarian.

One of my hobby interests is nuclear fusion. This is the safe combination of hydrogen ions that releases tremendous energy while producing helium as a by-product. Unlike nuclear fission found in modern plants, fusion is environmentally safe from the beginning to end. There are no greenhouse emissions, risks of a meltdown, or need to store radioactive waste. The biggest technical challenge is producing more power than is consumed by the process to contain the reaction.

In recent years, there have been several significant advances in nuclear fusion by teams around the world. In 2014, the National Ignition Facility (NIF), Livermore, CA was able to demonstrate positive net power by using lasers in the containment process. Last year, the Germans at the Max Planck Institute for Plasma Physics, successfully demonstrated a new containment shape called a Stellarator that took over 1.1 million hours to build.

With global support, including the U.S. government, France is building the world's largest scale traditional Tokamak under the organization ITER. General Fusion in Canada has a novel approach to nuclear fusion and is receiving financial backing from Jeff Bezos, founder and CEO of amazon.com.

All of this brings me to my idea. The former Navy submarine base in North Charleston would make an ideal location for a nuclear fusion training facility with the short term goal of building a prototype reactor and long term goal of building South Carolina's first power producing nuclear fusion reactor. Access to water is major advantage for a fusion reactor. The timing for such a facility couldn't be better because recent advances by others are producing valuable lessons learned narrowing the ideal design path.

This facility would attract some of the world's best and brightest to South Carolina. It would provide jobs to many supporting industries and create entire new industries. Long term it would lead to South Carolina being one of the first places in the world with truly clean energy.

Sincerely yours,

Steven J. Cagle

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