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Consideration of Environmental Impacts on Temporary Storage of Spent Fuel After Cessation of Reactor Operation

Comment On: NRC-2012-0246-0456

Waste Confidence - Continued Storage of Spent Nuclear Fuel; Extension of Comment Period

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Comment on FR Doc # 2013-26726

Submitter Information

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General Comment

I am a recent graduate of University of Wisconsin-Madison with a nuclear engineering degree and I am currently a nuclear core designer for Duke Energy and a member of NAYGN, but the views expressed here are my personal opinion.

As someone who is concerned about the environment, I am a strong supporter of nuclear energy. In fact, it is the reason I became a nuclear engineer. Nuclear energy is safe, reliable, and does not emit greenhouse gases during operation.

Why is it safe? Nuclear power has the lowest number of deaths per kilowatt hour when compared to fossil fuels, biofuel, rooftop solar, and wind power. [James Conca, "How Deadly Is Your Kilowatt?" Forbes, June 10, 2012]

Why is it reliable? The United States nuclear fleet has a capacity factor of 90%.

Finally, nuclear power does not emit carbon dioxide, methane, or nitrous oxide during operation.

An advantage of nuclear energy, over other sources of electricity generation, is the concentrated manner of the waste. Nuclear waste is a solid, and very compact, unlike gases, ash, particulate matter, toxic chemicals from solar panel production, etc. from other types of electricity generation.

This waste, or "used fuel," accumulated over 50 years of nuclear operation in the US, can fit in the area of one football field filled to a height of about 20 feet. [Max Carbon, "Nuclear Power: Villain or Victim?"] I feel much more confident handling this waste, than I would other types of waste.

In addition to being compact, another advantage of nuclear waste is the fact that it's not really waste. We can use our spent fuel to generate more energy and, in the process, reduce the amount of waste and the longevity of the waste (right now we have to store waste for a set period of time, but we could substantially reduce that time period by using up the long-lived waste and turning it into energy). Recycling is currently utilized in France and has been done for decades.

Recycling nuclear waste is an option available for us (in the U.S.) in the future, right now we are considering if we feel confident that nuclear waste can be handled at our reactor sites. The answer is yes. It has been done for decades and we have the technical expertise to handle our nuclear used fuel.

The NRC has considered issues including land use, socioeconomics, environmental justice, climate and air quality, geology and soils, surface-water quality and use, groundwater quality and use, terrestrial resources, aquatic ecology, species and habitats, historic and cultural resources, noise, aesthetics, waste management, transportation, public and occupational health in their analysis and found a low environmental impact for storing nuclear waste.

Whether in pools or dry casks, with proper maintenance and monitoring, there is no reason that used nuclear fuel could not be stored onsite indefinitely. Many may think it is arrogant to assume we can have confidence in storing something for 100,000's of years. Actually, nuclear waste from a fission reactor has been stored on earth for approximately 2 billion years without any storage casks. The Oklo reactors are natural reactors active approximately 2 billion years ago [Alex P. Meshik, *The Workings of an Ancient Nuclear Reactor*, *Scientific American*, January 26, 2009]. The 'waste' from these reactors was never contained by human actions and yet it remained stable for billions of years within the geological formation where it formed.

Many of the environmental concerns the public has with nuclear waste storage stem from a fear of radiation. I would like to address the perception of radiation that exists with the public.

Radiation is 'mysterious' (really, it's just quantum mechanics!) and some people think it is scary because you can't see it/touch it/smell it and you don't know when you are being irradiated. In fact, you are being irradiated all the time. Radiation is naturally occurring and it's found all around us! Life would not be possible without radiation.

The radiation risks from nuclear power are carefully studied. The requirements for radiation exposure to the public are so stringent that nuclear power plants release less radiation than coal plants as coal contains radioactive elements that are unfiltered before entering the atmosphere. [Max Carbon, 'Nuclear Power: Villain or Victim?']

Health physicists, nuclear engineers, and regulators have made and continue to make very conservative assumptions regarding how much radiation exposure to the public is acceptable and nuclear power plants are required to operate within those limits even in the event of an accident.

In the nuclear industry, safety and health of the public and environment are first and foremost in the minds of employees (like myself).