

April 15, 2011

Robert Caron, CEO  
Energy Technologies Company  
robert@infohwy.us

Dear Mr. Caron:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your March 21, 2011, letter and your suggestion of using liquid helium as a coolant for the reactors and spent fuel pools at Fukushima. Your efforts to deliver this possible solution are appreciated, and I thank you for your participation in problem solving as a concerned citizen.

As you point out, liquid helium has a very low temperature; however, it also has a very small heat capacity and the heat of vaporization (84.5 Joules per mole) is modest. Therefore, this solution would require a significant amount of liquid helium on a continuing basis to initially cool the fuel and then to prevent decay energy from reheating the fuel. We estimate that each megawatt of decay heat would require 47 kilograms (kg) of liquid helium every second or about 4 million kg per day.

As you point out, the challenges of availability and accessibility of liquid helium as well as the transportation logistics to the site would be the first variables to consider. As a long-term strategy, transporting the calculated quantities of 4 million kg per day could prove to be problematic and, as a result, could tax the ability to supply liquid helium to the site. Again, we appreciate your contribution, and we will continue to look for opportunities to use your suggestion.

Sincerely,

**/RA/**

Brian W. Sheron, Director  
Office of Nuclear Regulatory Research  
U.S. Nuclear Regulatory Commission

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