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**To:** [Maxwell Daniels](#)  
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**Subject:** Use of DD-108 neutron generator with ISU sub-critical assembly  
**Date:** Thursday, July 20, 2017 3:46:00 PM

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We have evaluated your proposal to use a neutron generator to pulse your sub-critical assembly, and concluded that you may use the neutron generator under the current authorization in Materials License SNM-1373. Our finding that you may proceed without an amendment is based on the following understanding. If your understanding differs, please inform us.

It is our understanding that you want to use the Adelphi Technology DD-108 Neutron Generator described at <http://www.adelphitech.com/products/dd108.html>. The technical brochure located at [http://www.adelphitech.com/pdfs/DD108-9\\_generator\\_Flier\\_24-Nov-14\\_A.PDF](http://www.adelphitech.com/pdfs/DD108-9_generator_Flier_24-Nov-14_A.PDF) states that the device uses deuterium gas to produce 2.45 MeV neutrons. The NRC does not regulate the possession and use of deuterium, so there is no need to add the device to one of your NRC licenses.

PLEASE NOTE – NRC regulates tritium and a license amendment would be needed to possess and use a tritium neutron generator.

Our criticality safety evaluation concluded that using a neutron source will affect the fission rate, but will not affect the neutron multiplication or criticality analysis. From the description and pictures of the neutron generator, it appears that it would only contain a small amount of deuterium. As long as this is not permitted to come into physical contact with the SNM, there should be no issue. Based on our understanding that there is no practical way for the deuterium gas to come into physical contact with the uranium fuel plates, we find the use of the neutron generator acceptable.

Please let me know if you have any questions.

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