

**From:** [Ullrich, Elizabeth](#)  
**To:** [Bose, Satya R.](#)  
**Cc:** [Wutoh, Anthony K.](#); [MAHAN, ALICE A](#); [Nekhai, Sergei](#)  
**Subject:** RE: RE: license amendment request dated May 8, 2019  
**Date:** Wednesday, July 10, 2019 8:16:00 AM

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Dr. Bose,

Thank you for providing this information. Please clarify the request for the authorized limits, because the new requested limit of 500 millicuries for germanium-168 and sodium-22 [ is in the form of a solid epoxy matrix, containing less than 5 nanocuries each] seems unrealistic. Also, it is not clear to me if you intended to request a broad authorization as was suggested as an option, or if you meant only to raise the limits for each radionuclide from the amounts proposed in the May 8 letter. You need to choose one of two ways to have these and the other short-lived radionuclides to be listed on your license.

Please choose **either**

1. To have each radionuclide listed as individual line in the amounts and forms stated in the letter dated May 8, 2019 (that is, F-18, 200 mCi; Cu-64,, 200 mCi; Ga-67, 200 mCi; Ge-68, 1 mCi; Ga-68. 200 mCi; Zr-89, 200 mCi; Na-22, 1.5 mCi; In-111, 200 mCi; Lu-177 200 mCi; I-124, 200 mCi; I-125, 500 mCi);

**OR**

2. Request that the individual line items for these AND the other short-lived radionuclides currently listed on your license, be replaced by the following authorization: **“Any byproduct material with atomic numbers 3 through 83 with half-lives less than or equal to 120 days, “Any” form, not to exceed 500 millicuries per radionuclide and 4 curies total.”**

Please note that I suggested the 4 curie maximum based on you already have listed on the license the following line items that would be replaced by this authorization

- P-32 500 mCi
- S-35 250 mCi
- Fe-59 100 mCi
- I-125 500 mCi
- I-131 500 mCi.

And the requested amounts in the May 8 letter

- F-18, 200 mCi
- Cu-64,, 200 mCi
- Ga-67, 200 mCi
- Ge-68, 1 mCi
- Ga-68. 200 mCi
- Zr-89, 200 mCi
- Na-22, 1.5 mCi
- In-111, 200 mCi
- Lu-177 200 mCi
- I-124, 200 mCi
- I-125, 500 mCi

So, by assuming you possessed all of these maximum quantities at the same time, a total limit of 3452.5 millicuries would be needed if the duplication of the I-125 limit is not required. Therefore a total limit of 4 curies in the 3-83 authorization seems reasonable.

Thanks,  
Betsy

Betsy Ullrich, Senior Health Physicist  
USNRC Region I  
2100 Renaissance Boulevard, Suite 100  
King of Prussia, PA 19406  
610-337-5040 (office)  
240-704-4575 (cell)  
[Elizabeth.ullrich@nrc.gov](mailto:Elizabeth.ullrich@nrc.gov)

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**From:** Bose, Satya R. [mailto:satya.bose@Howard.edu]

**Sent:** Tuesday, July 09, 2019 4:54 PM

**To:** Ullrich, Elizabeth <Elizabeth.Ullrich@nrc.gov>

**Cc:** Wutoh, Anthony K. <awutoh@Howard.edu>; MAHAN, ALICE A <alice.a.mahan@Howard.edu>; Nekhai, Sergei <snekhai@Howard.edu>; Bose, Satya R. <satya.bose@Howard.edu>

**Subject:** [External\_Sender] RE: license amendment request dated May 8, 2019

Good Afternoon Ms. Ullrich,

Please see the attached documents, in response to your email requesting additional information. Kind Regards - Satya Bose

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Satya R. Bose, Ph.D., DABR  
Associate Professor, Radiation Oncology  
Director of Radiation Safety  
Radiation Safety Officer  
Chief Medical Physicist  
Howard University Health Sciences  
Washington DC 20059  
Phone: (202) 806-7216  
Fax: (202) 806-5432  
Email: [satya.bose@howard.edu](mailto:satya.bose@howard.edu)

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