

To: Tom Thompson, Mail Control#576786
Nuclear Regulatory Commission
Region 1 Licensing Assistance Team
475 Allendale Rd
King of Prussia, PA 19406


Subject: Request for license amendment (license # 45-01052021)

NASA Langley Research Center is requesting an amendment to our broadscope radioactive materials license to include tritium. We are undertaking a research program in Low Energy Nuclear Reactions (LENR) which has a remote potential to generate small amounts of tritium as an unintended byproduct. Any tritium generated would be discharged directly to the atmosphere via the gas exhaust system.

It is difficult to estimate an actual potential quantity that could be produced at this point since this process is merely theoretical. The generation of tritium is unlikely due to the fact that all the available ultra low momentum neutrons would be interacting at the surface of the reaction area. Although hydrogen is present at the reaction area, the absorption cross section for the nickel, which coats the surface area, is much higher than it is for hydrogen. Also, the hydrogen would have to go through 2 absorptions to become tritium. An extremely conservative estimate for the maximum amount of tritium produced for a successful LENR reaction would be 12 picograms (~117 nCi). The process can only generate tritium if the LENR reaction actually takes place. An upper limit of 100 confirmed reaction processes will be placed on the project in order to minimize the amount of tritium potentially produced. Verification of a positive reaction is possible through the detection of various forms of radiation emitted during the process, as well as the formation of other more easily detectable isotopes.

Using the Annual Limit on Intake for tritium of 0.08 Ci, if we assume that a member of public was directly exposed to the exhausted tritium from 100 tests which produce 117 nCi each the dose to that person would be only 0.8 mrem. We are requesting a total annual possession limit of 1.2×10^{-5} Ci.

This project is currently on schedule to commence testing at the beginning of February; therefore we are requesting an expedited review process. We have no reservation should the amendment restrict the tritium addition to only apply to this process. Should you require further information about this amendment request, please do not hesitate to contact our Radiation Safety Officer, Kim Merritt at (757)864-3210 or kim.d.merritt@nasa.gov. Our scientific staff will also be available to answer any questions regarding the process itself.



Jose Caraballo
Safety Manager

NASA Langley Research Center