



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555 - 0001**

May 22, 2000

G.M. (Bud) Smith, Jr.  
President  
Berthold Systems, Inc.  
Hopewell Business Park  
101 Corporate Drive  
Aliquippa, PA 15001

Dear Mr. Smith:

This is in reference to your letter dated April 18, 2000, requesting an evaluation of the feasibility of an amendment to registration certificate NR-0186-D-117-B to raise the maximum activity per source from 10 microcuries to 50 microcuries. We have reviewed the information that you provided. NRC is able to consider your request, however, please note that the information provided would not be considered sufficient for us to make a determination. If you wish to pursue the amendment, please submit a complete application, following the guidance contained in NUREG 1556, Volume 3 (copy enclosed). In addition, please ensure that your application addresses the following issues:

1. The determination that no leak test was required for this device was based the combination of two primary factors. Increasing the activity would affect those factors as follows:
  - Cesium-137 calibration sources not exceeding 10 microcuries do not need to be leak tested. Each individual source does not exceed that limit. If the activity of each source is increased to be greater than 10 microcuries, this argument no longer can apply.
  - Devices that do not contain more than 100 microcuries of Cesium-137 do not have to be leak tested. Where each source does not exceed 10 microcuries, it would require damage to 11 individual sources in order to exceed the 100 microcuries. It was determined that the probability of this occurring was low. If the activity of each source is increased to be greater than 10 microcuries, the probability increases that enough sources could be damaged at once to exceed 100 microcuries. Specific to your request, if the activity of each source is increased to 50 microcuries, only 3 need to be damaged in order to exceed 100 microcuries. The probability of this occurring is significantly greater than for simultaneous damage of 11 sources.

In order to justify whether a leak test is needed, you must specifically address the items in 10 CFR 32.51(b).

2. Regarding your item #1, please provide justification for your statement that the requested change would reduce risk during assembly. In your justification, please address the following:
  - Given that although workers will handle fewer sources, each source will be larger and would exceed the limit for an exempt-use source (upon which your approval for no leak test was based).
  - The probability of errors in handling would be assumed to remain the same. Assuming for an example, that there was a 1 in 100 chance of damage to a source, whether you handled 500 10-microcurie sources and damaged 5, or you handled 100 50-microcurie sources and damaged 1, the total material is still 50 microcuries. However, with the 10-microcurie sources, unless there is only one handler, there would be the possibility that the exposure could be shared by more than one handler (since the probability of damage would be shared by all handlers), thereby lessening the burden to any one individual. Use of the 50-microcurie sources would put the entire burden on one user.
3. Regarding your item #2, please provide additional support for the claim that “there would be no additional risk to public safety”. Provide measured dose profiles at the surface, and at 5, 30, and 100 cm to support the statement that there is no change in the limits of surface radiation. We agree that there still would be no direct contact with sources during normal use; however, there is the potential for contact during installation. Please provide updated information regarding radiation doses expected during installation, given any changes to the external radiation dose profiles.

We trust that this answers your question.

Sincerely,  
/RA/ John Jankovich for

Frederick Sturz, Section Chief  
Section A  
Materials Safety and Inspection Branch  
Division of Industrial and  
Medical Nuclear Safety  
Office of Nuclear Material Safety  
and Safeguards

2. Regarding your item #1, please provide justification for your statement that the requested change would reduce risk during assembly. In your justification, please address the following:

- Given that although workers will handle fewer sources, each source will be larger and would exceed the limit for an exempt-use source (upon which your approval for no leak test was based).
- The probability of errors in handling would be assumed to remain the same. Assuming for an example, that there was a 1 in 100 chance of damage to a source, whether you handled 500 10-microcurie sources and damaged 5, or you handled 100 50-microcurie sources and damaged 1, the total material is still 50 microcuries. However, with the 10-microcurie sources, unless there is only one handler, there would be the possibility that the exposure could be shared by more than one handler (since the probability of damage would be shared by all handlers), thereby lessening the burden to any one individual. Use of the 50-microcurie sources would put the entire burden on one user.

3. Regarding your item #2, please provide additional support for the claim that "there would be no additional risk to public safety". Provide measured dose profiles at the surface, and at 5, 30, and 100 cm to support the statement that there is no change in the limits of surface radiation. We agree that there still would be no direct contact with sources during normal use; however, there is the potential for contact during installation. Please provide updated information regarding radiation doses expected during installation, given any changes to the external radiation dose profiles.

We trust that this answers your question.

Sincerely,  
/RA/ John Jankovich for

Frederick Sturz, Section Chief  
Section A  
Materials Safety and Inspection Branch  
Division of Industrial and  
Medical Nuclear Safety  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: As stated

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