



## JUPITER Corporation

Science, Engineering and Management Services

February 8, 1995

Mr. Thomas W. Rich  
Office of Nuclear Material Safety & Safeguards  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852-2738

Subject: Transmittal of Deliverables

Dear Tom:

Enclosed you will find the following deliverables that have been prepared under contract NRC-02-95-001:

- (1) Amersham Model 934 Gamma Irradiator (no assigned number) Package consisting of:  
JUPITER Technical Report, Rev. 2, dated January 30, 1995
- (2) Daybreak EPD Irradiator and Thermoluminescence System (Assigned No. 94-25)  
Package consisting of:  
JUPITER Technical Report, Rev. 1, dated January 30, 1995  
Proposed Deficiency Letter, Rev. 0, dated January 30, 1995
- (3) SRB Technologies Betalight MH (Assigned No. 94-72) Package consisting of:  
Proposed Deficiency Letter, Rev. 1, dated January 27, 1995
- (4) Ion Track Instruments Model 200 Leakmeter (Assigned No. 94-35) Package  
consisting of:  
JUPITER Technical Report, Rev. 0, dated January 31, 1995
- (5) AEP Industries Model TIAM 11 Thickness Gauge (Assigned No. 93-76) Package  
consisting of:  
JUPITER Technical Report, Rev. 0, dated February 2, 1995  
Registry Certificate, Rev. 0, dated February 2, 1995

Please contact me or Bob Waterfield if you have any questions concerning the enclosed materials.

Yours truly,

David R. Roth, Director  
Science & Engineering Department

9701310147 920612  
PDR RC \*  
SSD PDR

Enclosures (7)

## JUPITER CORPORATION TECHNICAL REPORT

## DAYBREAK/BORTOLOTT IRRADIATOR AND THERMOLUMINESCENCE SYSTEM

DESCRIPTION

The holder of license # 06-17253-01, which covers 3 sources, has submitted an application for renewal dated March 20, 1992, in which it is requested that two additional sources be included under this license. They also have Registry No. NR-0250-D-101-S for a Model 801 alpha multiple-sample irradiator, which recently became inactive. The sources are kept in irradiators (such as Daybreak model 740), and are never removed from them. They are used to irradiate mineral materials, which are placed in thermoluminescence sample holders.

The original application, dated 10/21/76, was for a 100 mCi Sr-90 source and a 1 mCi Am-241 source, stored in a lead container with 4 cm wall thickness. These were removed manually to shielded sample exposure jigs made by the applicant.

The Sr-90 shielded exposure device consisted of a lead source holder with 1 inch walls, with a shutter below. The shutter was operated by a rotary solenoid to control the exposure time on the samples to be tested for thermoluminescence. The shutter consisted of 1/16" of aluminum and 3/16" of lead.

The Am-241 source is mentioned in this application, but neither the radioactivity nor the device into which it was placed are described. Sketches indicate two different designs will be used.

SUBSEQUENT LICENSING HISTORY

Another application, in 1981, describes a number of devices, including the model 740 beta sample irradiator, the model 750 alpha sample irradiator, the model 800 beta and model 801 alpha multiple-sample irradiators. There was also a Model 760 vacuum alpha irradiator, similar to the model 750. Associated devices for heating and monitoring samples to obtain the thermoluminescence readouts were also included. It was necessary for the purchaser of these devices to procure and install their own sources, so Daybreak/Bortolot was not a manufacturer or a distributor of licensed devices.

An application dated 11/21/84 describes the same model 740 beta irradiator with 125 mCi of Sr-90.

Within the past two months, Registry No. NR-0250-D-101-S for the Model 801 irradiator device has become inactive. Since none of the other devices discussed above show up on the SSD-3 list, they must have all become inactive at some time in the past. They were probably licensed before registration was necessary, which may explain why they are not listed in the registry.

## CURRENT APPLICATION

The latest application, dated 3/20/92, requests the addition of two more sources, as noted at the beginning of this discussion. This application describes the model 1100 automated system, which uses the model 801 multiple sample irradiator, originally described in the 1981 application. The model 1100 system includes a computer-controller, a thermoluminescence oven, sample changer, and automated read-out system. The only part of the system involving byproduct material is the model 801 multiple sample irradiator, which was registered in the past, but has recently become inactive, as noted above.

Therefore, it appears that the change to the Registry required at this time is the addition of two sources, both of which are similar to those which were apparently licensed before the Registry was established. Since the other sources were not registered before this, they will need to be placed on this registry also. In addition, it will be necessary to establish a registry for (at a minimum) the use of all the various devices by Daybreak in its own facilities.

Region I has implied, on page 2 of its letter to Steve Baggett, that an improved irradiator is involved. However, the 1992 application clearly states the Model 1100 system (which is not a device) utilizes the Model 801 device previously registered. In the applicant's letter of March 4, 1993, he states that a "second irradiator identical to the first" is involved. He could have re-iterated that it was a model 801, but that information was already in the application.

## CONCLUSION

On the basis of this information, it appears that the only action required is to renew the just-terminated registration and change the registration certificate to include two additional sources, as the applicant has requested. In addition, registration certificates need to be established for any of the previously-licensed or registered devices which Daybreak wants to continue to use.

It would appear that Daybreak requires a custom-use registration at the present time. However, since they want to keep the option of selling these devices to others, they should be advised that, unless they obtain a registration as a manufacturer or distributor, each of their customers (as custom users, rather than general licensees) will be required to go through the registration process, and bear the costs and inconvenience associated with that process.

DAYBREAK.LTR

Mr. Victor J. Bortolot  
Daybreak Nuclear and Medical Systems, Inc.  
50 Denison Drive  
Guilford, CT 06437

Dear Dr. Bortolot:

Reference is made to your letters of March 4, 1993, and March 20, 1992 regarding your new System 1100 and fees for registration and licensing.

Since 1987, Part 30 of the NRC regulations has required licensees to have registration certificates, in addition to licenses, for sources and devices. None of your earlier devices, before the Model 801, ever had a registration certificate. In addition, the registration certificate for the Model 801 has recently been placed in "inactive" status. *not active*

If you wish to continue using this device, or any of the earlier models (such as Models 740, 750, 760, or 800), it is necessary that each of them be registered with the NRC, in addition to maintaining the license. There are at least two alternatives open to you regarding the registration of these devices.

You may register the devices for custom usage by your company alone, and provide services to customers who bring their samples to you. However, if other customers wish to purchase one of the devices for their own use, they will have to obtain their own custom-use registration and license. *llb*

Alternatively, you can obtain a registration and license as a manufacturer and distributor of the devices. That registration process would entail a thorough review to determine the safety of the devices for general use. Your customers would then be able to obtain a simple general license to use the devices.

In the second option, additional information will be required to demonstrate that the device has passed various prototype tests to show that it can withstand the expected conditions of use (such as temperature, shock, vibration, and cycling of the shutter) as described in ANSI Standard N432. In addition, your quality assurance program will receive a closer examination to assure that multiple devices will function in the same manner, and with the same degree of reliability, as the one you are using at your facility. *2*

Please advise us of the course of action that you choose to pursue. Based on our response, the appropriate registration review will be initiated.

Sincerely,

John

①

Def letter as constructed would require an additional letter soliciting the information needed in Pg Guide 10-10. Ltr was revised to ask Daybreak to decide and submit information accordingly.

②

Jupiter misunderstood the registration of model 84. It was a custom user but not for Daybreak, therefore the conclusions reached by Jupiter are incorrect.

③

Typos in model #s -

④

I revised to reflect change submitted sent out -

Shirley  
2/26/68

## JUPITER CORPORATION TECHNICAL REPORT

### DAYBREAK/BORTOLOTT IRRADIATOR AND THERMOLUMINESCENCE SYSTEM

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An application dated 11/21/84 describes the same model 740 beta irradiator with 125 mCi of Sr-90.

Within the past two months, Registry No. NR-0250-D-101-S for the Model 801 irradiator device has become inactive. Since none of the other devices discussed above show up on the SSD-3 list, they must have all become inactive at some time in the past. They were probably licensed before registration was necessary, which may explain why they are not listed in the registry.



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Therefore, it appears that the change to the Registry required at this time is the addition of two sources, both of which are similar to those which were apparently licensed before the Registry was established. Since the other sources were not registered before this, they will need to be placed on this registry also. In addition, it will be necessary to establish a registry for (at a minimum) the use of all the various devices by Daybreak in its own facilities.

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## CONCLUSION

On the basis of this information, it appears that the only action required is to renew the just-terminated registration and change the registration certificate to include two additional sources, as the applicant has requested. In addition, registration certificates need to be established for any of the previously-licensed or registered devices which Daybreak wants to continue to use.

It would appear that Daybreak requires a custom-use registration at the present time. However, since they want to keep the option of selling these devices to others, they should be advised that, unless they obtain a registration as a manufacturer or distributor, each of their customers (as custom users, rather than general licensees) will be required to go through the registration process, and bear the costs and inconvenience associated with that process.

## Comments

- 1) If GPR doesn't request information necessary to initiate user, so before we would need to send another GPR & over a response send
- 2) Jipit would have to verify the model so there a custom ~~data~~ user (advertiser) before the conclusion reached by Jipit not correct.



## JUPITER CORPORATION TECHNICAL REPORT

### BORTOLOTT IRRADIATOR AND THERMOLUMINESCENCE SYSTEM (ASSIGNED #94-25)

#### DESCRIPTION

The holder of license # 06-17253-01, which covers 3 sources, has submitted an application for renewal dated March 20, 1992, in which it is requested that two additional sources be included under this license. The sources are kept in irradiators (such as Daybreak model 740), and are never removed from them. They are used to irradiate mineral materials, which are placed in thermoluminescence sample holders.

The original application, dated 10/21/76, was for a 100 mCi Sr-90 source and a 1 mCi Am-241 source, stored in a lead container with 4 cm wall thickness. These were removed manually to shielded sample exposure jigs made by the applicant.

The Sr-90 shielded exposure device consisted of a lead source holder with 1 inch walls, with a shutter below. The shutter was operated by a rotary solenoid to control the exposure time on the samples to be tested for thermoluminescence. The shutter consisted of 1/16" of aluminum and 3/16" of lead.

The Am-241 source is mentioned in this application, but neither the radioactivity nor the device into which it was placed are described. Sketches indicate two different designs will be used.

#### SUBSEQUENT LICENSING HISTORY

Another application, in 1981, describes a number of devices, including the model 740 beta sample irradiator, the model 750 alpha sample irradiator, the model 800 beta and model 801 alpha multiple-sample irradiators. There was also a Model 760 vacuum alpha irradiator, similar to the model 750. Associated devices for heating and monitoring samples to obtain the thermoluminescence readouts were also included. It was necessary for the purchaser of these devices to procure and install their own sources, so Bortolot was not a manufacturer or a distributor of licensed devices. 1992-01-12  
1992-01-12  
1992-01-12

An application dated 11/21/84 describes the same model 740 beta irradiator with 125 mCi of Sr-90.

#### CURRENT APPLICATION

The latest application, dated 3/20/92, requests the addition of two more sources, as noted at the beginning of this discussion. This application describes the model 1100 automated system, which uses the model 801 multiple sample irradiator, originally described in the

1981 application. The model 1100 system includes a computer-controller, a thermoluminescence oven, sample changer, and automated read-out system. The only part of the system involving byproduct material is the model 801 multiple sample irradiator, which was already licensed in 1981, or at least the application was dated then.

Therefore, it appears that the only change to the license being requested at this time is the addition of two sources, both of which are similar to those already in the license. This would seem to constitute a minor license amendment (with renewal) for the addition of the sources, since all other equipment and facilities remain the same.

Region I has implied, on page 2 of their letter to Steve Baggett, that an improved irradiator is involved. However, the 1992 application clearly states the Model 1100 system (which is not a device) utilizes the Model 801 device previously licensed, and in the applicant's letter of March 4, 1993, he states that a "second irradiator identical to the first" is involved. He could have re-iterated that it was a model 801, but that information was already in the application. - 2.

#### CONCLUSION

On the basis of this information, we feel that the only action required is to renew the existing license, and change the registration certificate to include two additional sources, as the applicant has requested. The license would appear to belong under Fee Category 3E, as suggested by the applicant.   
no  
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