

MAY 22 1991

University of Cincinnati
 ATTN: Donald Harrison, M.D.
 Senior Vice President
 and Provost for Health
 Affairs
 141 Health Professions Building
 Mail Location 663
 Cincinnati, Ohio 45267-0663

License No. 34-06903-05
 License No. 34-06903-09
 License No. 34-06903-11
 License No. 34-06903-13
 License No. SUD-265
 License No. SNM-490
 EA 91-01

Gentlemen:

Thank you for your letter dated February 8, 1991, in response to the concerns described in our letter dated January 23, 1991, regarding certain of your activities authorized by Licenses No. 34-06903-09, No. 34-06903-13 and No. SUD-265.

We have no further questions regarding your response to concerns No. 1 and 2 of License No. 34-06903-09 and concern No. 1 of License No. 34-06903-13. We will review the actions you have taken during a future inspection.

In regard to concern No. 3 of License No. 34-06903-09, we acknowledge that the current license does not require conductivity checks and that irradiator pool water is filtered through a demineralizer system. Your successful operating history does not preclude future problems or provide assurance that source integrity is not degrading from corrosive materials. Consequently, it is desirable as a precaution to operate the sources in a low corrosion environment. The effectiveness of your filtering system should be verified and the NRC considers conductivity to be the best method of checking the water purity.

Proposed 10 CFR 36, "Licenses and Radiation Safety Requirements for Large Irradiators," was published in the Federal Register on December 4, 1990. Proposed 10 CFR 36.33(e), 10 CFR 36.61(a)(4) and 10 CFR 36.63(a) and (b) specify water purification system design requirements, operational testing requirements including water conductivity testing and conductivity test equipment calibration requirements. Workshops have been conducted with licensees on these proposed rules, comments have been incorporated, and the final rule is expected to be published during 1991. A copy of this proposed rule is enclosed for your information.

In regard to concern No. 1 of License No. SUD-265, our position remains as previously stated. Specifically, your current neutron survey instrument calibration method appears to be an instrument constancy check rather than a determination of instrument response to both fast and thermal neutrons throughout each instrument scale. While we do not perceive this as a significant safety issue requiring immediate action, we plan to reevaluate this matter during renewal of License No. SUD-265.

9105300308 910522
 REG3 LIC30
 34-06903-05 PDR

IE07
 11

MAY 22 1991

In regard to concern No. 2 of License No. SUD-265, we maintain that your neutron survey techniques (i.e., shielded probe measurements only) do not appear to discriminate between dose contributions from both fast and thermal neutrons. However, since the thermal neutron contribution to the total neutron spectrum at your facility is small, we do not consider your neutron survey methods to constitute a significant safety problem and have no further questions regarding this matter at this time.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter will be placed in the NRC Public Document Room.

We will gladly discuss any questions you have concerning these matters.

Sincerely,

"Original signed by W. L. Axelson"

Charles E. Norelius, Director
Division of Radiation Safety
and Safeguards

Enclosure: Proposed
10 CFR 36

cc w/o enclosure, w/ltr
dtd 02/08/91:
DCD/DCB (RIDS)

RIII
WA
Slawinski/ms
05/15/91

RIII
WKS
Cameron
05/16/91

RIII
WKS
Schultz
05/16/91

RIII
WKS
Grobe
05/21/91

RIII
WKS
Norelius
05/21/91

WKS



February 8, 1991

Refer to:91-056

Charles E. Norelius, Director
Division of Radiation Safety
and Safeguards
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Mr. Charles E. Norelius:

In response to your concerns outlined in the letter dated January 23, 1991 and hand-delivered to the University of Cincinnati on January 25, 1991.

License No. 34-06903-09

1. Emergency Response personnel are unaware of necessary response actions and responsibilities.

Written emergency response procedures were provided to all appropriate departments prior to the inspection. After the inspection, the departments were contacted and response procedures were reviewed with the appropriate personnel. Since the inspection, the alarm system has been integrated with the campus police dispatch emergency system. The appropriate response procedures are related by the system to the dispatcher. The dispatcher then relays the information to appropriate personnel. All procedures are performed in accordance with the University of Cincinnati police emergency response network.

2. Low pool water level alarms are not continuously monitored.

The low pool water level alarms have been connected to the University of Cincinnati police emergency system. This system is continuously monitored by the police dispatcher.

3. Pool water conductivity checks are not performed.

The University of Cincinnati's license does not require conductivity checks. "Conductivity testing" for wet source -

9103040249
FEB 11 1991

storage irradiators is suggested by the NRC in their Draft Regulatory Guide and Value/Impact Statement Division 10 task FC 403-4 "Guide for the preparation of applications for... self contained wet source - storage irradiators...". The suggestion concerning conductivity testing (sec 9.4.1e) is preceded by the statement "the pool should be equipped with a system capable of keeping the water clean". The University of Cincinnati keeps the water clean by filtration and chlorination. Since the makeup water for the pool is city tap water, the conductivity cannot be guaranteed. The University of Cincinnati has been operating successfully for fourteen (14) years without problems using this method of "cleaning" the water. Therefore, the University of Cincinnati does not believe that conductivity testing is necessary.

License No. 34-06903-13

1. Elevated teletherapy treatment head radiation levels were measured during the inspection.

A review of the device (shutter assembly) showed no indication of a malfunction. Expected values from a properly functioning shutter would result in the exposure rate readings at the units collimator to be of the same order of magnitude as the exposure rate reading at the top of the head. Extensive surveys with multiple survey instruments confirmed the expected results. Reading taken at the top of head (at contact) ranged from 70 to 80 mR/hr and readings with the collimator wide open (at contact or as close to contact as the survey instrument would allow) ranged from 100-150 mR/hr. Because the collimator also acts as a shield, exposure rate readings at the collimator vary with the size of the collimator opening.

License No. SUD-265

1. Neutron survey instrument calibration may not be adequate.

The University of Cincinnati does not possess any neutron sources with certified dose rates. However, the University of Cincinnati did purchase neutron survey instruments with exposure rate calibrations certified by the instrument manufacturer. Since the purchase of the instruments (and in accordance with the procedure outlined in the license) a reproducible setup had been used to verify the instruments response to neutrons. The setup uses four(4) PuBe sources of varying activity (1,2,3,4 Ci) to give a response at various points throughout the range of the instrument. The setup also uses paraffin bricks to produce varying thermal neutron spectrums. If the instrument observed reading exceeds 10% of

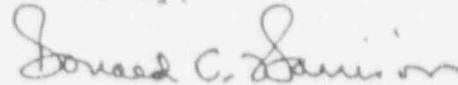
the expected reading (the reading noted during the original calibration setup), the meter is adjusted.

The University of Cincinnati feels the original calibration established, by secondary standard methodology, a known dose rate for each of the PuBe sources and thermal neutron spectrums. Therefore, the procedures used are sufficient to calibrate the instrument for neutron/dose rate response.

2. Neutron survey procedures may not be adequate.

The setup used to calibrate the neutron survey instruments uses unshielded PuBe sources (fast neutrons) and PuBe sources shielded by up to three (3) paraffin bricks. The bricks (thermal neutrons) were incorporated into the calibration procedures to confirm the instruments of the response to varying thermal neutron energy ranges and spectrums. Therefore, the University of Cincinnati feels the instruments are calibrated for any neutron spectrum which maybe produced from the PuBe sources used at the University of Cincinnati.

Sincerely,



Donald Harrison, M.D.
Senior Vice President and
Provost for Health Affairs