



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

December 15, 1993

Mr. Donald E. Richardson
Corporate Radiation Safety Officer
Troxler Electronic Laboratories, Inc.
3008 Cornwallis Road
P.O. Box 12057
Research Triangle Park, NC 27709

Dear Mr. Richardson:

We received your letter dated November 16, 1993, wherein you requested the U. S. Nuclear Regulatory Commission to review Troxler's interpretation of the new 10 CFR Part 20 regulations. Specifically, to determine if Troxler is providing customers with accurate information as to ensure compliance with the new Part 20 regulations. After careful review of the letter submitted, the following responses are being provided:

1. Monitoring Requirements

Requirements for monitoring are applicable to gauge users if there is a potential for workers to exceed 500 mrem (10% of the 5 rem) from external sources and internal sources. If a licensee is required to monitor both external and internal exposures then the external and internal doses must be summed. However, since industrial gauge licensees only have the potential for exceeding 500 mrem from external sources only, licensees are not required to monitor internal doses. [Reference 10 CFR 20.1502]

2. Occupational Dose Limits

The occupation dose limit for the whole body is still 5 rem per year (sum of external and internal exposure). Please note that the quarterly limits have been eliminated from the new regulations. Other limits that have changed are: [Reference 10 CFR 20.1201]

50 rem/year to any organ (sum of deep dose equivalent and committed dose equivalent)

15 rem/year to lens of eye (eye dose equivalent)

50 rem/year to skin (shallow dose)

50 rem/year to extremities (shallow dose)

3. Eye Dose Equivalent

Individual monitoring of the dose equivalent to the lens of the eye is required if the eye dose is likely to exceed, in a year, 1.5 rem (10% of 15 rem). The 15 rem eye dose equivalent applies to the dose to the lens of the eye and is measured at a tissue depth of 0.3 cm. The 5 rem total effective dose equivalent (TEDE) limit is the sum for the deep dose equivalent at a tissue depth of 1 cm and the committed effective dose equivalent. In general, a person can receive 15 rem to the eye

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(measured at 0.3 cm) without exceeding the 5 rem limit on deep dose when the head is exposed to beta or low-energy photon radiation, although it would be rare for an individual to receive 15 rem eye dose equivalent without exceeding a deep dose equivalent of 5 rem. [Reference 10 CFR 20.1201]

4. Dose to Embryo Fetus

The dose limit to embryo/fetus of a declared pregnant worker is 500 mrem during the entire pregnancy. However, if it is obvious to all that the worker is pregnant but has not formally declared herself in writing to be pregnant to the licensee, the embryo/fetal dose limits do not apply. If the licensee determines that the embryo/fetus has exceeded 0.5 rem, or is within 0.05 rem of the dose limit by the time the woman declares her pregnancy, the licensee may allow the embryo/fetus to receive an additional 0.05 rem during the remainder of her pregnancy. [Reference 10 CFR 20.1208]

5. Monitoring and Occupational Dose Limits for Non-Gauge Users

Once an individual enters a restricted area, he/she is not a member of the public. Hence, a non-gauge user such as a secretary or a dispatcher working in a restricted area is also subject to compliance to the NRC guidelines for occupational dose limits. Again, dosimetry is required for workers likely to receive a dose in excess of 10 percent of the occupational dose limits. [References 20.1003 and 20.1502]

6. Storage Facilities within Unrestricted Areas

The 2 mrem in an hour limit is not new; the limit applies to the dose in an unrestricted area from radiation sources either inside or outside of that unrestricted area. Doses around the periphery of storage facilities located within an unrestricted or controlled area must be within this limit for licensee compliance. Compliance can be determined by appropriate surveys of the area. [Reference 20.1301]

7. Dose Limits for Individual Members of the Public

Industrial gauge licensees must comply with unrestricted area dose limits (2 mrem in any one hour) as well as the dose limit to members of the public (100 mrem per year). Compliance with unrestricted area dose limits does not preclude licensees from complying with the member of the public dose limits. Licensees are required to monitor exposure to radiation and to radioactive material at whatever level it takes to demonstrate compliance. Compliance with the annual dose limit for members of the public can be demonstrated by 1) measuring or calculating the TEDE to the individual likely to receive the highest dose from licensed operations and showing that this TEDE does not exceed the annual dose limit, or 2) by demonstrating that if an individual were

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continually present in an unrestricted area, the dose from external sources would not exceed 0.002 rem in an hour and 0.05 rem in a year. [20.1301(b)].

If you have any further questions concerning the new 10 CFR Part 20 regulations, please contact me at (301) 504-2629.

Sincerely,

Cynthia G. Jones, Section Leader
Programmatic Safety Section
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

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