



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENCLOSURE

JUN 22 1989

MEMORANDUM FOR: Ronald R. Bellamy, Chief, EPRPB, DRSS, Region I
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FROM: LeMoine J. Cunningham, Chief
Radiation Protection Branch
Division of Radiation Protection
and Emergency Preparedness
Office of Nuclear Reactor Regulation

SUBJECT: CORRECTION OF MISUNDERSTANDING CONCERNING
OCCUPATIONAL DOSE LIMITS FOR "EXTREMITIES"

The purpose of this memorandum is twofold: (1) to document the correction of a misunderstanding concerning occupational dose limits for "extremities," and (2) to provide guidance concerning potential enforcement action in cases in which licensees have incorporated this misunderstanding into their procedures.

10 CFR Part 20 provides different occupational dose limits for (1) the "whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads;" (2) the "hands and forearms; feet and ankles"; and (3) the "skin of the whole body." As indicated in the instructions for NRC Form 5, "Current Occupational External Radiation Exposure," the dose to the "hands and forearms; feet and ankles" includes the dose to the skin of these body parts. The dose to the skin is assessed at a depth of 7 mg/cm² in tissue. Thus, the limit for the "skin of the whole body" and the limit for the "whole body..." apply to all parts of the body except the "hands and forearms, feet and ankles."

The term "extremities" has often been used to designate the "hands and forearms; feet and ankles," although this term is not used in 10 CFR Part 20. The term "extremities" is used in the pending major revision of 10 CFR Part 20 where it has the different meaning of "hand, elbow, arm below the elbow, foot, knee, and leg below the knee." However, this revised definition should not be used until the effective date of the major revision.

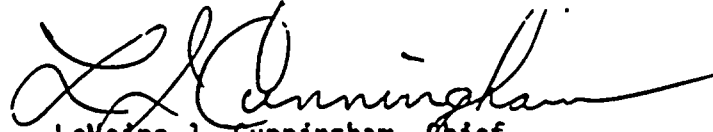
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the licensee corrects the procedure(s). Enforcement action should be considered for any licensee who, after being given a copy of this memorandum, refuses to correct a procedure that incorporates the misunderstanding of the dose limits of 10 CFR Part 20; however, please contact me before you initiate any such action.

This memorandum has been coordinated with the Office of Enforcement.

A handwritten signature in dark ink, appearing to read 'L. Cunningham', is written over the typed name.

LeMoine J. Cunningham, Chief
Radiation Protection Branch
Division of Radiation Protection
and Emergency Preparedness
Office of Nuclear Reactor Regulation

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IE Information Notice No. 81-26, Part 3, Supplement No. 1, "Clarification of Placement of Personnel Monitoring Devices for External Radiation," was issued July 19, 1982. That information notice discusses placement of personnel dosimeters for determining whole body doses in situations where the principal source of radiation is from underfoot. That information notice indicates, and our position continues to be, that, in these situations, "a reasonable placement for a whole body dosimeter would be just above the knee." That information notice also notes that "extremity monitoring requirements may dictate the placement of additional dosimeters in the feet and ankle area."

Information notices cannot impose or change regulatory requirements and Information Notice No. 81-26, Part 3, Supplement 1 did not change the requirements of 10 CFR Section 20.101. Nevertheless, some licensees and, in at least one instance, regional personnel have maintained, incorrectly, that Information Notice No. 81-26, Part 3, Supplement 1 defined or redefined the terms "extremity", or "extremities" to include the knee and the lower leg between the knee and the ankle and thereby extended the applicability of the 18.75 rem dose limit for the "extremities" to the lower leg above the ankle and to the knee. Some licensees have changed their radiation protection procedures to incorporate this misunderstanding and thereby to misrepresent the dose limits of 10 CFR Part 20.

This misunderstanding of the requirements of 10 CFR Part 20 has been identified primarily in relation to potential violations of the occupational dose limits resulting from radiation exposures from hot particles on or near the skin. One example of this misunderstanding is the result of an informal survey taken by one licensee and reported to the NRC. In that survey, ten nuclear power stations were contacted and asked, "If one of your personnel had been exposed to a hot particle in the region of the body between the middle of the knee and ankle, would you identify the dose as being to the skin of the whole body or to the extremity?" Four stations responded, correctly, that they would record the dose as the skin of the whole body. The other six stations said they would record the dose as being to the "skin of the extremity", thus indicating their misunderstandings of both 10 CFR Part 20 and Information Notice No. 81-26, Part 3, Supplement No. 1.

In summary, for exposures of the knee and the lower leg above the ankle, the applicable occupational radiation dose limits of 10 CFR Section 20.101 are:

- (1) the whole body dose limit of 1.25 rem per quarter or 3 rem per quarter, and
- (2) the skin of the whole body limit of 7.5 rem per quarter.

This memorandum is being placed in the NRC Public Document Room and I encourage you to make it available to licensees.

Licensees who have incorporated the misunderstanding concerning "extremity" doses into their procedures should be asked to correct those procedures; however, no enforcement action should be taken for such incorrect procedures if

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