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RECORD #33

TITLE: Supplement 1; Clarification of Placement of Personnel
Monitoring Devices For External Radiation

FICHE: 14357-355

0403/82

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

July 19, 1982

IE INFORMATION NOTICE NO. 81-26, PART 3, SUPPLEMENT NO. 1: CLARIFICATION OF
PLACEMENT OF PERSONNEL MONITORING DEVICES FOR EXTERNAL RADIATION

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or
construction permit (CP), research and test reactors, fuel facilities, and
Priority I material licensees.

Purpose:

This information notice is a supplement to IE Information Notice 81-26, Part 3:
Placement of Personnel Monitoring Devices for External Radiation Exposure,
issued in August 1981. Guidance provided in August 1981 concerning dosimeter
placement for determining whole body doses in situations where the principal
source of radiation is from underfoot was overly conservative.

Discussion:

The earlier guidance was,

"If the principal source of radiation is from underfoot, the appropriate
location for the dosimeter might be on the lower leg just above the ankle,
since the long bones of the lower leg contain active blood-forming marrow."

As defined in 10 CFR 20.101(b)(3), "'dose to the whole body' shall be deemed
to include any dose to the whole body, gonads, active blood-forming organs,
head and trunk, or lens of eye."

According to the International Commission on Radiological Protection (ICRP)
publication No. 23, "Report of the Task Group on Reference Man," an adult's
long bones of the lower leg contain essentially no blood-forming red bone
marrow. Red marrow has been replaced by yellow marrow after the 18th year;
yellow marrow performs no blood-forming function and is mainly fatty tissue.
ICRP-23 shows for the reference man's femur (thigh bone) a steeply declining
red marrow content until the early to middle twenties when no red marrow is
evident in the femur shaft. However, in discussing red and yellow marrow
distributions, ICRP-23 states, "...it must be pointed out that there is much
variation, and exceptions should not be regarded as unusual." In the woman,
"...the red marrow may occupy up to one-half to two-thirds of the shaft of the
femur...."

Another factor is the body's ability to physically replace the yellow with
active, red marrow in periods of stress, such as anoxemia, blood loss, anemia,
etc. The time frame for the red for yellow marrow replacement was not known
when ICRP-23 was published.

Guidance:

To monitor an adult for whole body doses when the principal source of radiation is from underfoot, a reasonable placement for a whole body dosimeter would be just above the knee. Any further generalization for whole body dosimeter placement could be non-conservative, considering reported variability because of age, race, sex, and state of general health. Note that extremity monitoring requirements may dictate the placement of additional dosimeters in the feet and ankle area.

No written response to this information is required. If you need additional information regarding this matter, please contact the Regional Administrator of the appropriate NRC Regional Office.

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Division of Engineering and
Quality Assurance

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Attachment:
List of Recently Issued IE Information Notices

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
82-23	Main Steam Isolation Valve (MSIV) Leakage	7/16/82	All BWR power reactor facilities holding an OL or CP
82-22	Failures in Turbine Exhaust Lines	7/9/82	All power reactor facilities holding an OL or CP
82-21	Buildup of Enriched Uranium in Effluent Treatment Tanks	6/30/82	All uranium and plutonium fuel fabrication licensees
82-20	Check Valve Problems	6/28/82	All power reactor facilities holding an OL or CP
82-19	Loss of High Head Safety Injection Emergency Boration and Reactor Coolant Makeup Capability	6/18/82	All power reactor facilities holding an OL or CP
82-18	Assessment of Intakes of Radioactive Material by Workers	6/11/82	All power reactor facilities holding an OL or CP, other specified licenses
82-17	Overpressurization of Reactor Coolant System	6/10/82	All power reactor facilities holding an OL or CP
82-16	HPCI/RCIC High Steam Flow Setpoints	5/28/82	All power reactor facilities holding an OL or CP
82-15	Notification of the Nuclear Regulatory Commission (NRC)	5/28/82	All NRC licensees and all power reactor facilities holding a CP
82-14	TMI-1 Steam Generator/Reactor Coolant System Chemistry/Corrosion Problem	5/12/82	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit